



ENVIRONNEWS

INTERNATIONAL SOCIETY OF ENVIRONMENTAL BOTANISTS

Newsletter

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Announcement for Pre-Registration

Fifth International Conference on Plants & Environmental Pollution (ICPEP-5)

3-6 December 2014

Lucknow, India

Organizers

International Society of Environmental Botanists and
CSIR-National Botanical Research Institute, Lucknow

Chairman, International Organizing Committee (IOC):

Dr. C.S. Nautiyal, Director CSIR-NBRI, CSIR-CIMAP & President ISEB

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Detailed information and Pre-registration form can be downloaded from ISEB website.

Note: We are regularly receiving complaints from members of ISEB for non-receipt of some issues of Environews. While appreciating the disappointment of these members about the loss of the newsletter in postage, we are unable to post duplicate copies due to our limited resources. However, we may provide electronic version of missing issues on request.



LETTERS

I have received the Environews Vol.19 No. 1 January, 2013. It was very interesting to note that in the News letter you have covered a detailed account on the CSIR-NBRI Celebrations of its Diamond Jubilee and Annual Day on October 25, 2012. I am glad to note that Bharat Ratna Dr. A.P.J Abdul Kalam, Hon'ble former President of India was the Chief Guest of the inaugural function while His Excellency Shri. BL Joshi, Governor of Uttar Pradesh, graced the occasion as the Guest of Honour and Prof. S K Brahmachari, DG, CSIR delivered the inaugural address. On this occasion, a publication 'A success story of 60 years' was released by Dr. APJ Abdul Kalam and he remembered fondly the contributions of CSIR-NBRI in creating a Touch and Smell Garden at Rashtrapati Bhavan in 2004. Prof. Brahmachari in his inaugural address highlighted the unique contributions of NBRI in creating the Tactile garden at Rashtrapati Bhavan. Dr. Sopory, Chairman of NBRI, RC congratulated NBRI on the transitional changes brought in botanical research at NBRI under the dynamic leadership of past and present Directors. Such detailed accounts of the Diamond Jubilee and Annual day function was very beautifully covered by the Newsletter. The News letter also covered a number of other articles which are very informative. Thank you for this great service.

Dr. P. Pushpangadan

Padma Shri Awardee, DG, AIHBPD & Senior Vice President, RBEF, Trivandrum-695005. **India**
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I greatly enjoyed reading Dr. C.S. Nautiyal's, New Year Message in the EnviroNews (Vol. 19, No. 1, January 2013). I read the newsletter regularly and find it very informative and interesting. I wish you continued success.

Yash Pal Kalra

Retired Soil Chemist, Canadian Forest Service, Edmonton, Alberta, **Canada**
<yashpk1@hotmail.com>

The International Society of Environmental Botanists is doing an outstanding work to create environmental awareness among the people. They have contributed to bring international community of environmental botanists to Lucknow. Please keep up the excellent work.

Dr. C.R. Bhatia Former Secretary
Department of Biotechnology, Govt. of India, **Navi Mumbai**
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I am a student of Prof. S. B. Chaphekar and was your member in the past and have also attended International Conference at Lucknow in 1996. I am very happy that I am again associated with ISEB. I would like to take active part in all events organized by ISEB. Currently, I am working in the field of Phytoremediation for Indoor Pollution. I know your Institute CSIR-NBRI is actively working in the field of Phytoremediation for several years. I would like to receive some expertise from your Institute in the future. I would like to contribute some articles in Environews. I will let you know the timeframe in a short while. I am happy that I am associated with ISEB as a Life member.

Dr. Seemaa Ghate

Women Scientist in Know How Foundation, Pune, **India**
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I received the email containing the new Rules & Regulations of ISEB and I wish to inform you that I am substantially in favor of the changes. In particular, I do feel that the 3 year rotation of Advisors is an appropriate change. I have felt guilty for not being able to contribute more in recent years, and that too little had been asked of me for the position of an Advisor. I appreciate the honor of that position. I have had travels to the Philippines where I have given presentations on plant anatomy, and in North Korea where I actually worked one summer teaching plant biology at the only private university in that country. I also had other work in Malaysia and Thailand. I have been doing some text writing and reviewing of manuscripts, and have given some illustrated talks at local organizations. I still have an interest in the aims and objectives of ISEB, and always look forward to receiving EnviroNews quarterly. I want to extend to you my personal greetings and hope all is well with your life. With all best wishes, I am as ever, your friend and colleague.

Prof. Richard F.E. Crang

Formerly, Department of Plant Biology, University of Illinois, Urbana, IL, **U.S.A**
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WELCOME NEW LIFE MEMBERS OF ISEB

Miss Anamika Srivastava, Research Scholar in Birla Institute of Technology Mesra, Ranchi, India.

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Dr. Seemaa Ghate, D. S.T. Women Scientist in Know How Foundation, Pune, India.

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Mrs. Nupur Srivastava, Senior Research Fellow in the Department of Geology, Lucknow University Lucknow, India.

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Dr. O.P. Tripathi, Assistant Professor Department of Forestry, North-Eastern Regional Institute of Technology, Nirjuli, Itanagar, India.

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NEWS FLASH

Scientific talk organized by ISEB and CSIR-NBRI

A talk on "Global challenges- what the botanists concerned about the environment they live in, can do?" was delivered by Prof. C.R. Bhatia, former Secretary, Department of Biotechnology, Government of India, on 25th February 2013 at CSIR- NBRI. The talk was organized by the International Society of Environmental Botanists in collaboration with CSIR – National Botanical Research Institute, Lucknow.

Prof. Bhatia stressed on the current global problems - water, food, energy, environment, unemployment, increasing population, poverty and climate change. He explained that how food, water and energy are interchangeable. With more water, more food as well as energy can be produced. With more energy, more water can be made available. It can be transported over long distances. The sea water can be used as fresh water after desalination. However, this is highly energy intensive method. Further, food can be converted to energy, e.g., ethanol, biofuels. He also emphasized on the environmental impacts of the green revolution technologies which led to environmental crises like land degradation, depletion of ground water, pesticide residue in soil and plants going in food web, brown clouds formed due to burning of straw, and loss of traditional varieties and biodiversity.

He pointed out that all global issues are further magnified in case of India because of the high population density and poverty of large section of the population. This is putting pressure for more food, water, energy and clean environment for sustainability of the increasing population. Prof. Bhatia raised the question to the botanists as to how and what they can do to resolve these problems and gave his own suggestions like (i) enhancing land productivity with limited inputs of water, energy, plant nutrients and management, (ii) reducing the production cost of food and raw material for industry (e.g. cotton textile, sugar and jute industries). While increasing the productivity of plants the botanists need to be proactive in identifying environment damaging practices and develop technologies to prevent and reverse the adverse environmental impacts. He suggested that plants can be used as sensitive indicators for monitoring environmental pollutants. Prof. Bhatia emphasized that botanists can further play important role in solving the different global problems. He further added that beside scientific research, botanists have also to play societal role for resolving these problems. They can create social awareness on the environmental issues, e.g. by giving plants instead of flowers on all occasions, segregation of garbage and recycling biological

waste into manure and, adopt environmental friendly practices. Land area of the country is finite, therefore, the economic growth can be possible if the plant scientists focus and translate their vision into reality to improve rural economy and create demand for industry and services for overall growth of the economy.

Compiled by: Dr. Nandita Singh, Principal Scientist,
CSIR-NBRI

Vigyan Vibhushan award to four Life Members of International Society of Environmental Botanists

Four Life Members of ISEB viz., Padmashri Dr. Nitya Anand, FNA (Former Director, CDRI, Lucknow), Prof. R.S. Tripathi, FNA (INSA Honorary Scientist, CSIR-National Botanical Research, Institute, Lucknow) Dr. P.K. Seth, FNA (CEO, Biotech Park, Lucknow) and Prof. H.N. Verma, FNASC (former, Pro-Vice-Chancellor, University of Lucknow and presently, Pro Vice-Chancellor, Jaipur National University), well known for their extraordinary achievements in different fields of Science, were honoured with the prestigious VIGYAN VIBHUSHAN SAMMAN on 2nd March 2013 at a glittering inaugural function of the Firstst Uttar Pradesh Science Congress organized at D.D.U. Gorakhpur. University, Gorakhpur. The awards were presented by the Hon'ble, Shri Akhilesh Yadav, Chief Minister of Uttar Pradesh, and the function was presided over by the Hon'ble Shri Mata Prasad, Pandey, Speaker, Uttar Pradesh Vidhan Sabha.

Professor C.K. Varshney, Former Dean School of Environmental Sciences, Jawaharlal Nehru University (JNU), New Delhi and an Advisor of ISEB, at the request of the Indian Association of Air Pollution Control, delivered "Professor Nilay Chaudhuri Memorial Lecture" on "Air pollution and Food Security" at Vivekananda Hall, New Delhi. He was also presented a "Life Time Achievement Award" on 3rd December 2012, at an "International Conference on Recent Trends in Climate Change Researches visa-a-vis Biodiversity" hosted by the Department of Animal Sciences, M.P.J. Rohilkhand University, Bareilly.

Dr. Vivek Pandey, Principal Scientist, CSIR-NBRI and Joint Secretary of ISEB was on deputation to Copenhagen, Denmark from 24.2.2013 to 1.3.2013. This visit was to attend a "Book Workshop" in connection with the proposed publication of the book entitled "*Climate Change, Air Pollution and Global Challenges: Understanding and Solutions from Forest Research*". This edited book will be published by the Elsevier Publishers. Dr. Pandey is

contributing a chapter entitled "Impacts of Air Pollution and Climate Change on plants: Implications for India". The other co-authors of the chapter are Prof Elina Oksanen, University of Eastern Finland, Finland; Dr. Nandita Singh, CSIR-NBRI; Dr. Chhemendra Sharma, CSIR-NPL. This "Book Workshop" was held for the Lead authors. The idea was to obtain a first-hand overview on the highlights of each chapter, based on short presentations by the lead authors. The aim was to facilitate cross-linking between chapters.

Dr. S.C. Sharma, Vice President, International Society of Environmental Botanists participated in the International Conference on "Risk Analysis of Forest Invasive Alien Species" organized by IUFRO and local chapters at the Panjab University Chandigarh, India. Dr. Sharma delivered a lecture on "Ornamental Plants as Invasive Aliens: Problems and Solutions". Dr. Sharma, has been conferred with the Peer Recognition Award by the Bougainvillea Society of India New. Delhi for his outstanding R & D work on Bougainvillea.

Prof. R.S. Tripathi, INSA Honorary Scientist, CSIR-NBRI, Lucknow, and Advisor, ISEB has been nominated by the Ministry of Environment & Forests, Government of India, as the Chairman of the Advisory Committee on Ecosystem Research Programme for a period of three years. He also chaired a technical session at the International Conference on "Risk Analysis of Forest Invasive Alien Species" jointly organized by Panjab University and International Union of Forest Research Organization (IUFRO) during 27 Feb-1 March, 2013 at Chandigarh, and delivered an invited talk on "Regeneration of tree species in natural and semi-natural forest ecosystems as influenced by invasive alien plants".

Dr. R.D. Tripathi, Chief Scientist, CSIR-NBRI and Additional Secretary ISEB has been awarded Certificate of Achievement for his excellent contribution and achievement in the field of science by the Organizing Committee of 1st Lucknow Science Congress 2013 organized by Babasaheb Bhimrao Ambedkar University (A Central University), Lucknow during 20-21 March 2013.

Foundation grant for ISEB

Prof H.S. Srivastava Foundation for Science & Society, Lucknow has released a onetime grant of Rs 100,000 to International Society of Environmental Botanists for instituting a medal in honour of late Prof. H.S. Srivastava who was Head of the Department of Botany, M.J.P. Rohilkhand University Bareilly. The medal will be awarded to a distinguished Scientist during ICPEP Conferences to be organized by ISEB.

ENVIRONMENTAL ISSUES OF EDUCATIONAL INSTITUTIONS

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Environmental issues include waste disposal and recycling, water management strategy, energy consumption, possibilities of using renewable energy and carbon footprint. These have been detailed below.

Issue 1: Waste Disposal and Recycling Strategy

Waste constitutes unwanted and discarded material. This waste needs to be disposed for clean, disease-free and healthy environment. Wastes can be classified as municipal, industrial, agricultural, medical, mining waste and sewage sludge. Wastes can be hazardous if they are toxic to plants and animals, inflammable, explosive, corrosive or highly reactive chemical.

The following wastes are generated out of the activities on the institutes:

The Waste Generated out of the Sewage.

The Waste Generated from Canteen.

The Waste Generated out of laboratories operating on the institutes.

The Waste Generated out of the offices specially the paper waste.

The e-waste generated out of the usage of printers, and computer and allied equipment.

The Waste generated due to litter (leaf fall) in the premises of the institute.

Presently, the garden waste is thrown outside the institute for animals to feed on. The broken glasswares are collected and returned to the concerned suppliers. The harmful chemicals are autoclaved and hence become harmless. The canteen waste is segregated into food materials (biodegradable) and plastic materials (nondegradable). Paper waste is shredded through shredding machine,

and thereafter given to the administration department for handing that over to the junk monger. Rest of the waste is dumped besides hostel from where the waste collector takes it the next morning.

Suggested Strategies

The waste management and recycling strategies are used in the institutes. However, the following actions and improvements could be suggested:

1. Develop public education and awareness programs.
2. For garden waste, a big pit should be dug inside the institute and garden waste should be put in it so that it forms manure.
3. Use of polythene bags etc. should be banned in the institute.
4. Instead of using cans in the canteen, if bottles and glasses are used, it will lead to lesser waste.
5. Prevent wastage of paper. If some corrections are required in the document, they should be done in soft copy instead of taking out the drafts in hard copy. This will reduce wastage of paper.
6. The faculty and students be encouraged to use both sides of the paper before sending it for shredding in the security department. This implies that all the rough work must be done on the reverse side of used paper.

Issue 2: Energy consumption and possibility of using renewable energy

Life on this planet depends upon a large number of things and services provided by the nature, which are known as natural resources. Thus water, air, soil, minerals, coal, forests, crops and wild life are all examples of natural

resources. The natural resources are of two kinds: Renewable resources and Non-renewable resources. Renewable resources are those that can be regenerated e.g. forests, wildlife, wind energy, biomass energy, tidal energy, hydropower etc. Non-renewable resources cannot be regenerated. Fossil fuels like coal, petroleum, minerals etc. are the examples of non-renewable resources. Once we exhaust these reserves, the same cannot be replenished. Even our renewable resources can become non-renewable if we exploit them to such an extent that their rate of consumption exceeds their rate of regeneration.

Relevance for Institute

Assuming an institute has around 100 air conditioners with 525 Ton capacity. Fans are approx 1200, tube lights are approx 2000, water pumps are 10, water coolers are 20 and aquaguards are 20 and the contracted load is 1500 KVA. As a standby, a Diesel Generator of same capacity is also kept. Diesel Set emission is an area which requires immediate attention and proper action is required from pollution control point of view.

Suggested Strategies

For promoting renewable source of energy and reducing energy consumption in Institute, the following strategies can be adopted:

1. In the institute canteen, food can be cooked using pressure cookers. This will save cooking fuel/energy.
2. The Solar Energy Utilization: The solar energy can be directly used for the water heating purposes. The city of Lucknow has a bright sunshine during the most part of the year. The hot water obtained from solar heaters can be used even for cooking

and this will reduce the heat requirement from cooking gas or electricity. There is a possibility of installing such water heating arrangements for canteen and other purposes where costs may not be prohibitive.

3. Reduction in the electricity consumption by natural air conditioning: Most of the buildings these days are single wall buildings and this increases the temperatures of the inner environs of the building. A double wall would reduce the room temperature to a considerable extent. This external wall could be made at a cheaper cost and can also be used as a decorating wall. This point may be looked into wherever new constructions are being planned.
4. Cleaner window panes will lead to more lighted rooms and reduce the requirements of electricity.
5. Air Conditioning: There should be strict air conditioning temperature maintenance at 20 - 22 degrees in each room thereby reducing the energy utilization. Temperature thermometers could be installed at the initial level and later, a central temperature controller could be adopted.
6. There is a need for continuous effort for encouraging faculty, staff and students to participate in reducing power consumption programmes by making it a practice to switch off all the lights, fans and gadgets when not needed.
7. NEDA (Non-Conventional Energy Development Agency) is situated in Lucknow. Scientists and officials may be invited to the Institute to make cost-effective suggestions for use of non conventional energy.
8. PCRA (Petroleum Conservation Research Association) people may be invited for creating better awareness about petroleum conservation among the faculty, staff and students.

9. Automatic light/electric equipment installation: It has been observed that many a time, the lights remain switched on in the classrooms as there is no one to switch them off in the rooms. An automatic electricity switch off system could be installed leading to efficient energy utilization.

10. Diesel Engine emissions of carbon mono-oxide (Co) are very large in cu-m capacity and this is very hazardous gas for the health of living beings. An inverter (a device to convert DC in AC) is now a feasible replacement for DG sets. Therefore, if inverter is purchased in place of DG set of 600 KVA, its higher capital cost is compensated by the non-use of diesel within six months. It is, therefore, suggested that Institute should go for inverter so as to totally eliminate production of hazardous gases namely carbon dioxide and carbon mono-oxide.

11. Students may be asked to service their vehicles regularly and check tyre pressure periodically.

Issue 3: Water Management

Water is an indispensable natural resource on this earth on which all life depends. Now-a-days, water is the burning foreign policy issue for water-short countries.

Institute lawns are watered daily from 1 to 2 hours. Usually gardeners water plants through *hazara* (cane with multiple holes) and lawns through rubber or plastic pipe.

Following strategies can be used in the institutes for effective water management:

1. Water should not be wasted and reused wherever possible. For example, the waste water being left out of the usage of the water coolers can be diverted for irrigating the lawns.
2. Rain water should be harvested. Every roof is a potential water harvesting structure. The roofs

should be slanting and beneath it trenches should be dug so that water seeps into the ground and water level is maintained.

3. The drip irrigation system should be used in lawns and gardens.

Issue 4: Carbon Footprint

Carbon Footprint is the amount of carbon dioxide emitted due to daily activities. It is also a measure of the amount of carbon dioxide emitted through the combustion of fossil fuels in the case of a business organization.

The institutes as centers of learning are not only propagators of the concepts of prevention of environmental damage but are also practitioners. There are a number of sources that add to environmental pollution, for example, the generator, the usage of electricity, the usage of water and unprecedented usage of energy forms for example in cooking etc. Hence, the concept of carbon footprint is very relevant for the institutes.

Suggested Strategies:

Following strategies can be used in the institutes for reducing carbon footprint:

1. Plantation of trees in the universities institutes can be promoted. This will not only provide beauty, shade, shelter and food items to the institutes, but also will act as a life time sink of pollutant. Evergreen trees are good collectors of dust. *Ficus*, *Mangifera*, *Tectona* and *Polyalthia* have been reported to be efficient dust collectors (Varshney, 1992). *Solanum melongena* and *Cyamopsis tetragonoloba* are efficient removal of sulphur dioxide. A proper green belt consisting of these trees should be formed all over the institute.
2. For the institute canteen, more in-season foods instead of tinned, preserved and imported foods can be purchased. Tinned, preserved and imported foods need more fuel inputs, which means a bigger carbon footprint.

3. Common mass public transport system: There could be a common mass transport system that can be used for connection to the Public Transport System or even a system which could be used to supplement the existing Public Transport System (PTC) for the employees and students of the institutions. For this purpose battery driven automobiles could be used. The system could also be used to connect the two institutes. This action will reduce the fuel emissions from various automobiles.
4. Placards small posters display in and around the institute: In order to generate awareness amongst the various stakeholders on the institute an easy learning and a continuous sense of environmental protection could be brought about by displaying placards/small indicators on the institute.
5. Common oath taking on issues of environment by the institute employees: A common oath could be a good help and motivator to have better environmental commitment amongst the stakeholders of the organization.
6. Faculty, employees and students who stay nearby should be encouraged to use bicycles.
7. Role model display of environment-friendly techniques by the senior employees of the institution.
8. Special plantation drive by the employees and students in the month of July every year.

BETEL VINE (PIPER BETLE), A PAN-ASIATIC CULTURAL PLANT IN THE PROCESS OF RECLAIMING ITS PAST GLORY

Nikhil Kumar

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Plants are integral part of life and human dependence on plants is too well known to emphasize. Besides providing food shelter and clothing it also provides oxygen which is essential for all aerobic life forms including humans. This absolute dependence has been recognized by different cultural Diasporas round the world. Some of the ancient cultures have integrate many plants than those which evolved later, for example, the culture born out of industrial revolution which considered everything as exploitable resource be it humans, animals or plants. While this approach accelerated rapid changes (growth depending on definition), it very much failed to integrate plants to culture. This was noticed by one of the founding fathers of America (USA) Thomas Jefferson who observed "the greatest service that can be rendered to any nation is integration of plants to its culture". With respect to cultural integration of plants the distinct divide is visible between North and South and East and West.

Integration of plants to culture grants autonomy to individuals (of that society) so far as its use is concerned and may also offer protection from introduction of taxes by the state as the plant being a

commodity acquires a status beyond it. Cultural integration of plants therefore is also a most effective way to judicious use and an effective conservation.

Present day India (and more so for undivided India) is also a unique place in Asia (may be in the whole world) where all the practicing religions of the world today, exists and thrive. With this diversity of faiths there are also sets of cultural plants. Interestingly some of such plants cut across the religious divides (it must be emphasized that in spite of the extra efforts by the bigots and also petro money from foreign lands; the divide have not harmed the society significantly so far) and patronized by the two major faiths in India. *Piper betle* (PB) is one such plant that is the symbol of love, civility and respect for both the major religious groups in India. Its heart shape leaf and how deep the lips and tongue becomes reddish due to chewing is considered as the depth of love as goes this saying '*Paan ka rang mohabat ka rang*'. In almost all the written languages of India there is a word for PB; largely derived from Sanskrit and also in Dravidian languages. The Latin name PB is derived from Malayalam. Thus, PB is the rightful national symbol and assertion of

cultural bonding in India and the carved out states in the past due to the well known imperialistic machinations. In the past due to the well developed trade links PB was also patronized by the Arabs and Persians as there are words for PB in both the languages having Sanskrit roots showing the introduction PB earlier to the advent of Islam.

Before going through the properties which makes its cross cultural acceptance it may serve a great purpose to make an analysis that why its use has declined over years. India was a British colony in the recent past (just a generation back if 50 years is considered for generation change) and their interest lied in making us consumers of their products and a source of raw material. It will be useful to recall how cigarettes were promoted and made a whole generation to believe that modernity meant cigarette smoking. Cigarettes being industrial product generated profits to a few in the name of enterprise and free economy irrespective of health issues and in the name of free multiple choice different brands were offered and promoted in the name of modernity. It was only after millions and millions of deaths world over due to tobacco, primarily, due to

smoking cigarettes, it is now being slowly withdrawn. This is one example to illustrate what aggressive free trade with the sole motto of profit can do to humanity. Something similar is also happening in Indian context where recently introduced Pan Masalas (due to similar set of factors) causing serious health issues but surviving due to tax payment to the state and organized industrial activity. This will go as modern India's contribution to human misery similar to cigarettes once promoted by Europe and USA.

In this is the age of organized trade where packaging and marketing plays a great role in the trade which is also promoted and protected by state due to revenue generation through taxes. The total tax revenue in PB trade is either very low which makes state unwilling player so far this plant is concerned. In other words state is not a stake holder and it is largely left between grower and consumer to manage on their own. It may be a unique case where a non-food, non-spice plant with no narcotic effect has acquired such a great importance that nearly 600 million people use it every day; a number second only to coffee and tea. It is not only the number but the extent of spread makes it a truly pan-Asiatic cultural plant as its cultivation/consumption goes from as far as extending 11,000 km west to east and 6000 km north to south, an area stretching from east Africa to Polynesia.

This underscores the faith of users and also realization of overall beneficial effects. PB is a plant with known ethnomedicinal properties and its use in India and other centuries of Indochina region- Indonesia, Malaysia, Vietnam, Laos, Kampuchea, Thailand, Myanmar, Singapore and far-east. Use of PB leaf was known for centuries for curative properties such as: to reduce / get rid of bad bodily odor and bad breath, throat and lung problems, cough prevention and healing, to reduce unwanted vaginal secretion and bad smell, to prevent itch problems caused by fungus

and internal/external bacteria. In Chinese folk medicine betel leaves are used for the treatment of various disorders and claimed to have detoxication, antioxidation, and antimutation properties. It may be mentioned that the traditional health systems recognized the value of PB and discovered many uses. Several tribes in India still use it for curing and protecting from different ailments and several of the claimed PB uses have been validated over a period of time. Some of the work done earlier did show the useful effects of PB including a sense of well being. PB use involved chewing, ingestion and topical applications.

Though the beneficial effects of PB were known to the communities for more than 3000 years, its validation was seriously taken up in last twenty years. This was could begin only after demonstration by a group led by Dr Bhide, a lady scientist (they have greater faith in traditions than male counterparts) working in Tata Memorial Hospital & Cancer Research Institute demonstrated presence of anti cancer compound in the leaves. This is considered to be the turning point in PB research which opened the field of investigation in PB. In last fifteen twenty years almost all the activities outlined in Shushrut Samhita and also based on ethnomedicinal uses has been validated. The activities shown are The leaf extract, fractions and purified compounds showed role in oral hygiene, anti-diabetic, cardiovascular, anti-inflammatory / immunomodulatory, anti-ulcer, hepatoprotective and anti infective etc. Patents were also awarded for some of the biological activities like anti-inflammatory, anticancer and immunomodulatory associated with leaf extracts and purified compounds. The active compounds isolated from leaf and other parts are hydroxychavicol, hydroxylchavicol acetate, allypyrocatechol, chavibetol, piperbetol, methylpiperbetol, piperol A,

and piperol B. Phenols rich leaves of PB show high antioxidant activities. A number of biologically active compounds from PB have potential for use as medicines, nutraceuticals and industrial compounds. Since the traditional use of PB involves chewing, it offers possibilities of its use in drug delivery through buccal mucosa bypassing the gastric route.

Abuse of anything is bad so is the case with PB, its excessive use can lead to tooth decay, loss of appetite and other problems. It has been recommended that the best time to use PB is just after meals as it is claimed to help in digestion. It is also advised to used PB while going to attend any function or meeting as it is a very good mouth freshener and suppresses bad breath. Use of PB has been also recommended by Vatsyayana in *Kama Sutra* to be aphrodisiac.

Besides array of biological activities associated with this plant there is another first to its PB. The plant is native of tropics and once its properties were recognized and cultural integration it became essential to transfer this plant to not so favorable climates in the subtropical regions of India. Cultivation of PB in such regions lead to the evolution of whole set of technologies for cultivation which was recently recognize as first fully controlled cultivation in the world. This technology though based on totally naturally available materials it is as effective as the modern high material and energy intensive cultivation which has the history of not more than hundred years compared to almost 2000-2500 years for the humble hut evolved for PB cultivation. The message is that do not reject everything that is part of traditions, pause, examine and if not useful only then reject it and not because of opinions shrouded in the garb modernity. No aping, believe in science and the ability of your analysis!

GLOBAL CHALLENGES AND ROLE OF ENVIRONMENTAL BOTANISTS

C. R. Bhatia

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The major problems, the human society faces globally are, water, food, energy, and economic security. In addition, most developing countries, including India, face the problems of poverty, growing population, employment, inequality and clean environment. Above all, there are the uncertainties of climate change that could further aggravate these problems.

Science and application of the scientific knowledge alone can contribute towards amelioration of the above problems. A balance between population, consumption, waste, use of natural resources, and environment would be necessary for the survival and well being of the human societies. Plant scientists are better off than others because of their collective knowledge of plants that are the primary producers in the food chain, as well as indicators of the healthy environment represented by the area under forest cover. Plants use the solar energy and carbon-di-oxide – two free resources and convert them into carbohydrates, proteins and lipids. These are either consumed directly as food by humans or after conversion into milk, meat and eggs through animals. Primary productivity of plants, both in natural as well as agro-ecosystems, depends on the availability of suitable land, water, temperature and soil nutrients. Ever since the humans domesticated the plants, and started cultivating them, they have attempted to enlarge the harvest. Development of hybrid maize, semi-dwarf wheat, rice and sorghum are the classical examples. Application of nitrogenous fertilizers, pesticides to control insect pests, pathogens and weeds and mechanization of farm operations helped in realizing the enhanced genetic potential of the crop genotypes. The increased productivity led to higher income for the farmers, rural jobs and

prosperity. The increased availability of cereals, kept the food prices moderate, providing easy access within the purchasing capacity of the poor. The improved production technology – so called Green Revolution, also prevented cutting down the forests to bring additional land under cultivation which would have been unavoidable to meet the food demand.

The green revolution technology also led to inadvertent environmental degradation of the resource base in some areas. This included erosion of top soil due to the extensive ploughing, depletion of ground water due to excessive use, contamination of soil from pesticides, and of water bodies with the nitrates from fertilizer runoff and ill effects of the pesticides on human health. Therefore, sustainability of the production technology has been questioned.

However, in future, we have to produce additional food to meet the demand of rising population that is still growing at annual growth rate of 1.6 - 1.7. The increased amount of food must be produced on the same, finite land area, with depleting soil, water and energy resources, without further damaging the resource base and the environment. Hence, the question, what the Environmentalists/Botanists can do?

Plants are very sensitive to environmental perturbations. After the end of the second world war, following the use of nuclear bombs at Hiroshima and Nagasaki in Japan, plants were extensively used in USA and elsewhere to monitor the biological effects of radiations. Simple experiments using barley seeds or a specific clone of *Tradescantia* were extensively used. The same can be easily used for monitoring the radiation effects from telephone towers and micro-wave

ovens. Specific plant genotypes can be developed for monitoring other environmental perturbations. Extensive field experiments were also carried out to decontaminate soils or growing crops that will not accumulate radio-nuclides resulting from the nuclear fallout.

As the former Prime Minister of India, late Indira Gandhi said "Poverty is the worst kind of environmental pollution". The first priority in India should be to reduce poverty by enhancing plant productivity. Increased output is not possible without increased inputs and better management. Collective wisdom of the Environmentalists/Botanists can provide:

1. Location specific solutions, such as change to high value crops, and value addition to the produce at village level.
2. Proactive identification of environment damaging practices.
3. Develop technologies to prevent and reverse the adverse environmental impact on the resource base.
4. Enhance carbon sequestration through increased green cover to add soil organic matter.
5. Means to reduce green house gases, including methane and oxides of nitrogen.
6. Increasing photosynthetic, water and nitrogen use efficiencies by plants.
7. Enhance trapping of solar energy through human designed artificial leaves.
8. Create greater social awareness of the environmental problems. To some extent the environmental impact can be reduced by reducing wastage and consumption.

Let us start an electronic brain storming on "What Environmentalists/Botanists can do to improve the global issues of water, food, hunger, malnutrition, energy, poverty, environment and climate change".

NEWS & VIEWS

Biofuels cause pollution

Producing more biofuels to fight climate change could actually worsen a little known type of air pollution and cause almost 1400 premature deaths a year in Europe by 2020, according to a recent report from Lancaster University of U.K. The report said that trees grown to produce wood fuel – seen as a cleaner alternative to oil and coal – released a chemical, isoprene into the air, that when mixed with other pollutants, could also reduce crop yields. Poplar, willow or eucalyptus trees all used as fast-growing source of renewable wood fuel emit high levels of isoprene as they grow. Isoprene forms toxic ozone when mixed with other air pollutants in sunlight. Large-scale production of biofuels have small but significant effects on human mortality and crop yields. Burning biofuels is viewed as neutral for climate change because plants soak up carbon when they grow and release it, when they burn or rot, fossil fuels on the other hand add carbon to be atmosphere from underground stores millions of years old. Biofuels are often blamed for causing food price rise by competing for cropland. Responding to such criticisms the European commission has decided to limit crop-based biofuels – such as from maize or sugar to 5% of transport fuels.

Source: Alister Doyle

Environment Correspondent, Norway

Use of Palm leaves for water treatment

Date palm leaves – currently a waste product of date farming, could be used to remove pharmaceuticals and dyes from hospital waste water according to researchers from Sultan Qaboos University in Oman (SQU). Since 2010, SQU scientists have been working to establish a hospital wastewater treatment unit which would treat

wastewater loaded with microorganisms and pharmaceuticals – before its release into the sewers, and potentially produce water that could be used in crop irrigation.

The team has been working to produce 'dehydrated carbon', a greener alternative to 'activated carbon', which is derived from charcoal and requires the use of high temperatures. Using dehydrated carbon made from waste date leaves is greener, cheaper and more sustainable. Waste leaves are carbonized by sulphuric acid treatment at 170°C, before being used to treat waste water.

This technique could be used across most of the Middle East and North Africa where 180,000 tonnes of date palm leaves are produced annually. The scientists have found that dehydrated carbon produced from date palm leaves is as efficient as activated carbon for removing pharmaceuticals and dyes from waste water. Date palm dehydrated carbon was also extraordinary in removing heavy metals and can be reused many times. The scientists have also been producing different types of dehydrated carbon from agricultural waste such as rice husks and olive stones, which have all proved useful in removing different pollutants from water.

Source: Rehab Abd Almohsen

Sci Dev Net

Arctic Climate Change

The Arctic is a focal point for some of the most profound impacts of climate change. One of the world's top ice experts, from Cambridge University calls the situation a "global disaster," suggesting that ice is disappearing faster than predicted and could be gone within a few years. Due to global warming there has been ten ice growth during the winter and more ice melt

during the summer. Over the past 30 years, permanent Arctic sea ice has shrunk to half its previous area and thickness. As it diminishes, global warming accelerates. This is due to a number of factors, including release of the potent greenhouse gas methane trapped under nearby permafrost, and because ice reflects the Sun's energy whereas oceans absorb it.

Instead of adopting ameliorative measures, industry and governments are eyeing new opportunities to mine Arctic fossil fuels. Factoring, the numerous species of Arctic creatures-including fish, seabirds, marine mammals and polar bears- makes such an approval even more incomprehensible.

Royal Dutch Shell has been preparing to drill in the Arctic under a \$4.5 billion deal. A drilling rig, which was being towed broke free during a storm and ran aground on an island in the gulf of Alaska. The disastrous BP oil spill in the Gulf of Mexico in 2010 showed how dangerous ocean drilling can be even calm waters. With Arctic ice melting, Australia on fire and increasing droughts, floods and extreme weather throughout the world, it's past time to get serious about global warming.

Source: David Suzuki / Ian Hanington.

In-house Pollution Fatal to Newborns

According to global health experts millions died in India every year due to in-house air pollution. Consequently, Indian Council of Medical Research (ICMR) has launched a first of its kind study on impacts of air pollution on newborns in Tamil Nadu under the guidance of Dr. Kalpana Balakrishnan, Director ICMR Centre for Advanced Research on Environmental Health in Chennai. The study was started in 2011 to check the impact of in-house air pollution right from pregnancy. The research team noted that children and

mothers developed acute respiratory illness and other pulmonary diseases because of in-house air pollution. Smoke Cholas used in the household were the major source of pollution. In-house air pollutants are more toxic than the thick chemical smoke in the outside environment. The most common fuel used for cooking and heating is wood and other solid biomass such as charcoal, dung, agricultural residues and dry leaves. Long-time exposure to chemicals released from these solid fuels would aggravate respiratory diseases and result in death.

Asian Birds threatened from Climate Change

Researches conducted by the Durham University and BirdLife International in its finding concluded that change in the climate is causing a threat to the survival of various Asian bird species including the ones found in India. The research also warned that in case of extreme situations, these birds would be required to be moved physically to climatically-suitable areas. The study was conducted for 370 species of Asian birds. These are the species where conservation is a prime cause of concern in biodiversity hubs. The

findings of the study showed that for survival of these bird species it was important to properly manage the conservation sites.

It was shown that at least 45% and up to 88% of these 370 bird species would face a decrease in the availability of suitable habitats, which in turn would lead to change in the species composition in certain areas. As far as India is concerned, there are in all 466 important Bird Areas which are identified for hosting the different kinds of avian species, most of which also belong to the endangered category.

Toxic chemicals cause brain damage

Toxic encephalopathy or 'brain fog' is a serious but under-diagnosed brain disorder in which brain is toxic or poisoned and does not function properly because of some environmental toxins or chemicals. The symptoms of this disease are Dopey, dizzy, spacy, inability to think clearly or concentrate, poor memory, depression, fatigue unexplained mood swings.

The environmental toxins causing this disease are everyday chemicals found in furnishings, bedding building

construction materials, cosmetics, toiletries, traffic exhaust, office supplies pesticides and the toxins in wood smoke from heating with wood and burning wood and charcoal and forest fires. These chemicals diffuse through the nose lung membranes right into the blood stream and brain rather rapidly. And once there, if the person is low in any vitamins or minerals in the pathways to rapidly detoxify the chemical, the undetoxified amount back up and starts to do its damage, producing these bizarre symptoms. The erratic function of the brain can lead to accidents. For example, the inhalation of exhaust fumes has been the cause of some auto accidents and pilot error. Not knowing you have brain fog considerably jeopardizes personal relationships too, especially when it suddenly provokes mood swings. Or it can cause a child to be erroneously labeled as learning disabled or attention deficit disorder or poor achiever. Physician who is not knowledgeable in environmental medicine will vehemently deny the existence of brain fog or toxic encephalopathy, or erroneously refer the patient for psychiatric care. .

Source:

<http://www.burningissues.org/toxic-brain.htm>

AWARD OF ISEB FELLOWSHIP

International Society of Environmental Botanists like other national scientific bodies has also instituted the award of Fellowships to its Life Members from the present calendar year -2013. Each year a call for nomination shall be made in August/September and the declaration of the Award of ISEB Fellowship on December 03rd, the Foundation day of the Society.

ISEB's JOURNAL

The Society announces to launch a biannual scientific journal '*International Journal of Environmental Botany*'. The First issue of the journal will be released on December 03rd the Foundation day of the Society.

Editors: Prof. R.S. Tripathi & Prof. Mohammad Yunus,

Associate Editors: Dr. R.D. Tripathi & Dr. Nandita Singh

DISTINGUISHED VISITORS TO ISEB OFFICE

Dr. C.R. Bhatia FNA, Former Secretary, Department of Biotechnology Govt. of India, Navi Mumbai (25.02.2013).

Padma shri Dr. P. Pushpangadan Former Director, CSIR-NBRI, Lucknow and presently Director General & Senior Vice President, RBEF, Amity Institute of Herbal and Biotech Products Development (AIHBP), Thiruvananthapuram, Kerala. (04.03.2013)



CONFERENCES

2nd International Conference on Food and Environment

22-24 April, 2013; Budapest, Hungary
Contact: Irene Moreno Millan
Wessex Institute of Technology
Ashurst Lodge, Ashurst, Southampton, SO40 7AA
E-mail: imoreno@wessex.ac.uk

7th International Conference on the Impact of Environmental Factors on Health

23 - 25 April, 2013; Budapest, Hungary
Contact: Irene Moreno Millan
Wessex Institute of Technology
Ashurst Lodge, Ashurst, Southampton, SO40 7AA, U.K.
E-mail: imoreno@wessex.ac.uk

19th International Conference on Urban Transport and the Environment

29 - 31 May, 2013, Kos, Greece
Contact: Genna West
Wessex Institute of Technology
Ashurst Lodge, Ashurst
Southampton, SO40 7AA
E-mail: gwest@wessex.ac.uk

21st International Conference on Modeling, Monitoring and Management of Air Pollution

3 - 5 June, 2013; Siena, Italy
Contact: Rebecca Lawrence
Wessex Institute of Technology
Ashurst Lodge, Ashurst, Southampton, SO40 7AA
E-mail: rlawrence@wessex.ac.uk

9th International Conference on Ecosystems and Sustainable Development

18 - 20 June, 2013; Bucharest, Romania
Conference Secretariat
Irene Moreno Millan
Wessex Institute of Technology
Ashurst Lodge, Ashurst, Southampton, SO40 7AA
E-mail: imoreno@wessex.ac.uk

13th International Conference on Environmental Science and Technology

5-7 September 2013, Athens, Greece
E-mail: cest2013@gnest.org

4th International Conference on Energy and Sustainability

19 - 21 June, 2013; Bucharest, Romania
Conference Secretariat
Irene Moreno Millan
Wessex Institute of Technology
Ashurst Lodge, Ashurst
Southampton, SO40 7AA
E-mail: imoreno@wessex.ac.uk

Waste Management 2014

7th International Conference on Waste Management and the Environment
12 - 14 May, 2014; Ancona, Italy
Contact: Genna West
Wessex Institute of Technology
Ashurst Lodge, Ashurst
Southampton, SO40 7AA
E-mail: gwest@wessex.ac.uk



BOOKS

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Price. INR 1910.00 INR 1719.00

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