



# ENVIRONNEWS

INTERNATIONAL SOCIETY OF ENVIRONMENTAL BOTANISTS

## Newsletter

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### IN THIS ISSUE

Letters . . . . .	02
News Flash . . . . .	04
Opal: A Unique National Public Participatory Environmental Monitoring Project <b>J. Nigel B. Bell (UK)</b> . . . . .	05
Impact of Global Climate Change on Floriculture in India <b>S.C. Sharma &amp; R.K. Roy (India)</b> . . . . .	07
<i>Pyxine Coccoes</i> Nyl. - A Foliose Lichen as a Potential Bioindicator/biomonitor of Air Pollution in Philippines: an Update <b>Isidro T. Savillo (Philippines)</b> . . . . .	08
News and Views . . . . .	9
Conferences . . . . .	12
Books . . . . .	12

### Fourth International Conference on Plants & Environmental Pollution (ICPEP-4)

8-11 December 2010

Venue: NBRI, Lucknow, India

Organized by

**National Botanical Research Institute (NBRI), Lucknow, India and International Society of Environmental Botanists (ISEB)**

**Dr. Rakesh Tuli**

Director NBRI &  
President ISEB  
E-mail: dofficenbri@sify.com

**Dr. K.J. Ahmad**

Secretary ISEB &  
Organizing Secretary ICPEP-4  
E-mail: isebrilko@sify.com

**Dr. R.D. Tripathi**

Scientist NBRI &  
Organizing Secretary ICPEP-4  
E-mail: isebrilko@gmail.com

Registration open (Online or by mail)

**Contact: Organizing Secretaries, ICPEP-4  
National Botanical Research Institute, Rana Pratap Marg  
Lucknow-226001, India**

**E-mail: isebrilko@sify.com; Website: <http://isebindia.com>**

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**Council of Scientific & Industrial Research (CSIR), New Delhi**



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**Department of Biotechnology, Ministry of Science & Technology, Govt. of India, New Delhi**



**Ministry of Environment & Forests, Govt. of India, New Delhi**

\*A large number of national and international organizations, corporates and funding agencies are likely to join as sponsors in the near future.

## Happy New Year 2010

President and members of the Executive of International Society of Environmental Botanists wish  
**A Very Happy and Prosperous New Year**  
to all members of ISEB and valued readers of 'Environews'



## LETTERS

This is a very special time at Kew. Archives for October 1759 show a contract indicating the creation of Princess Augusta's physic garden – The first mention of the work that began our long history of scientific collection and research.

Many famous names built on this foundation – especially Joseph Banks, William Hooker and Joseph Hooker. By 1900, their contributions had established Kew as a leading centre for plant research with global collections and an important role in economic development. Along the way, an international network of botanic gardens and research centres had developed. This has now grown and transformed into a wide collaborative system that is taking on the most important crises faced by humanity today – climate change and the widespread loss of habitats and biodiversity.

Plant science has a vital part to play in meeting these challenges. Using energy from the sun, plants take carbon out of the air to produce oxygen and a vast range of useful materials, from food to pharmaceuticals. They also moderate water flows and weather. So, if we are to halt the deforestation that is pushing up CO<sub>2</sub> levels – and, indeed, repair and restore damaged areas, providing communities with the means of improving their quality of life – then we have to make good use of the knowledge and resources at our disposal.

We are now in the final stages of developing a collaborative approach, the Breathing Planet Programme, which will greatly increase the application of resources at Kew, and similar organizations worldwide, to bear on practical outcomes for a better future. If you would like to know more or can see new ways in which we could work together I would very much like to hear from you.

**Prof. Stephen D. Hopper, F.L.S.**  
Director  
Royal Botanic Gardens, Kew, U.K.

My visit to National Botanical Research Institute during my recent trip to Lucknow was a highly educative and intellectual experience. NBRI is a prestigious plant science institute under the aegis of CSIR, where scientists are doing commendable work under the dynamic leadership of Dr. Rakesh Tuli, the Director of the Institute.

International Society of Environmental Botanists (ISEB), a scientific society is located on the campus of NBRI. My visit to ISEB and interaction with its office bearers was a highly refreshing and rewarding experience. This NGO, with limited resources, is promoting and highlighting the role of plants in

environmental protection and biodiversity conservation at the local, regional and global levels.

With over 300 members in India, and some overseas countries, this society has won international recognition in a short span of 15 years. Among the main highlights of its achievements and contributions is the publication of a quarterly newsletter “**Environews**” which has a global reach and impact.

While many young and bright scientists of NBRI provide the work force for this Society, some highly distinguished retired scientists of NBRI form the backbone of this rapidly growing NGO. This mix of young talent and old experience has imparted a unique character to this society. I express my greetings and best wishes to ISEB.

**Mohammad Muazzam**  
Deputy Secretary to the Govt. of India  
Ministry of Environment & Forests, New Delhi (INDIA)  
E-mail: muazzam1953@gmail.com

Congratulations for the increasing global popularity of ISEB website. I am particularly very happy that ISEB keeps track of visitors and feels proud when someone from overseas visits the site (<http://isebindia.com>)

**Prof. Madhoolika Agrawal**  
Department of Botany, Banaras Hindu University,  
Varanasi 221 005 (INDIA)  
E-mail: madhoo58@yahoo.com

I am writing to you from the publisher **Earthscan, U.K** regarding the possibility of being involved in the forthcoming International Conference on Plants and Environmental Pollution (ICPEP-4).

We offer to promote it through our monthly e-newsletter (over 40,000 subscribers), our subject specific New Book E-Alerts (over 12,000 subscribers each) and on our online Conference Diary.

In addition, we would be able to give you a free banner on our new website that would advertise International Conference on Plants and Environmental Pollution as an official Earthscan event partner on our 'Ecology and Biodiversity' front-page.

If you could let me know whether we could have leaflets distributed (preferably as inserts in delegate packs), I would be most grateful.

Could you also let me know how many delegates you are expecting please, and whether delegate lists would be available?

**Emma Barnes**

Dunstan House, 14A St Cross Street, London EC1N 8XA,  
U.K.

Email: Emma.Barnes@earthscan.co.uk

I fully support the offer of collaboration made by Earthscan U.K to ICPEP-4. This is great. I could not contact you earlier as I was away for the last three weeks.

**Sagar V. Krupa**

University of Minnesota, St. Paul, MN, U.S.A.

E-mail: krupa001@umn.edu

I am a Botanist from Pondicherry, currently working in an Eco restoration project in the Tsunami affected coastal villages of Tamil Nadu. I read with great interest the article entitled "Arsenic Threat and its Remediation through Plants: A Step for Environmental Clean Up" by Deepika Sharma &

Sanjay Dwivedi published in October 2009 issue of *EnviroNews*. I would like to know whether the authors have published some other papers related to plants. If so, please provide me detailed information about them.

**Krishnan Moorthy,**

Pondicherry, India

E-mail: can\_do\_krish@yahoo.com

We are residing inside the Botanical Garden and enjoying our visit. The Garden is in an area of 600 hectares with fine landscaping and rich in plant collections. The Plant Houses are marvellous and display of the plant diversity is very educative. My discussion on *Bougainvillea* was very fruitful.

**S.C. Sharma**

Vice-President

International Society of Environmental Botanists

sharmasc\_bougainvilla@yahoo.com;

scsharmagardener@gmail.com

From: Fairy Lake Botanic Garden, Shenzhen, P.R. China

## WELCOME NEW MEMBERS

### INSTITUTIONAL MEMBER

National Backward Classes Finance & Development Corporation, New Delhi

(Mr. A.A. Naqvi, Managing Director)

E-mail: nbcfdc@del.3vsnl.net.in

### LIFE MEMBERS

**Dr. Prabodh K. Trivedi** is a Senior Scientist at the National Botanical Research Institute, Lucknow. Major research interests of Dr. Trivedi has been relate to chloroplast genome organization, molecular biology of fruit ripening, genetic enhancement for biosynthesis of secondary plant products as well as environmental biotechnology. He has successfully applied high throughput genomics infrastructure to analyze heavy metal stress in plants as well as to study regulation of secondary plant product biosynthesis. His recent contribution in deciphering modulation in genome-wide transcriptome in rice during arsenic stress as well as development of insect-resistant transgenic plants through pathway engineering of secondary plants products will lead to some path-breaking findings in near future.

E-mail: prabodht@hotmail.com

**Mr. Diganta Narzary** is a Research Associate (RA) in a DBT funded project entitled "Establishment of National Rice Resource Database" at NBPGR, New Delhi. He has

submitted his Ph.D. thesis on "**The genus *Punica* L. – Assessment of diversity and systematics using PCR-based methods**" at the University of Lucknow.

E-mail: d\_narzary@yahoo.co.in;

digantanbri@gmail.com

**Dr. Chandra Shekhar Nautiyal**, an internationally reputed microbiologists of the country is a Senior Scientist & Head, Division of Plant Microbe Interactions at the National Botanical Research Institute, Lucknow, India

E-mail: csn@nbri.res.in; csnnbri@yahoo.com

**Dr. Ram Sewak Chaurasia** is a Scientist in the Division of Botanic Garden & Floriculture Division at the National Botanical Research Institute, Lucknow, India.

E-mail: rsnbri@gmail.com;

drsrchaurasia@gmail.com

**Er. A.A. Malick** is Superintending Engineer at the National Botanical Research Institute, Lucknow, India. He has keen interest in development of parks, gardens and landscaping.

**Mr. Kuljeet Singh Sodhi** is a Senior Scientist at the Pre-Landscape Architecture at the Institute of Microbial Technology, Chandigarh, India.

E-mail: kuljeet@imtech.res.in

**Dr. Debasis Chakrabarty** started his research career in the field of induced mutagenesis for crop improvement using biotechnological tools at the National Botanical Research

Institute, Lucknow. Dr. Chakrabarty continued his further research activities at Chungbuk National University, South Korea on physiology and molecular basis of somatic embryogenesis as well as bioreactor technology. Dr Chakrabarty also visited France in 2003. There, he was involved in characterization of oligopeptide transporter gene family from *Arabidopsis*. In 2005, he joined NBRI as a scientist, where he is working on molecular basis for arsenic metabolism and development of transgenic rice with low grain arsenic. Dr. Chakrabarty has published over 60 research papers on different aspects of plant biology in national and international journals, and has contributed chapters in several books and published a series of review research papers.

E-mail: debasis1972@rediffmail.com

**Dr. Pankaj K. Srivastava** is a Scientist in the Division of Environmental Sciences at the National Botanical Research Institute, Lucknow, India. His current research interest is based on soil science that includes bioremediation of metal-contaminated soil, amelioration of sodic soils using environment-friendly techniques and improving soil carbon sequestration. He has also carried out several environmental auditing and environmental impact assessment studies.

E-mail: drpankajk@gmail.com;  
pankajk@nbri.res.in

**Dr. (Mrs.) Sayyada Khatoon** is a Scientist in the Pharmacognosy & Ethnopharmacology Division at the National Botanical Research Institute, Lucknow. Her fields of specialization are: Plant Anatomy, Chemotaxonomy and Pharmacognosy. She has been associated with active research & development (R&D) since 1985 in the field of quality evaluation of herbal drugs/formulations.

She is one of the authors of two books i.e. *Bark Drugs-vol.1* and *Paramparic Chikitsa evam Gharelu Upchar ke Padap-*

*Sankchipt Parichey* and also contributed more than 50 research papers/articles in various national & international journals. She has attended several national and international seminars/conferences on herbal drugs and more than 55 abstracts have been published by her in the souvenirs. She receive Dr. P.D. Sethi's Best research Paper Award 2005 "On application of TLC/HPTLC in Pharmaceuticals analysis & standardization of herbal drug". Besides, she has developed 7 herbal products, filed 14 patents and awarded 8 International patents and 3 Indian patents for cosmaceuticals & herbal health drinks.

E-mail: ayyadak@yahoo.com,  
sayyadak@gmail.com,  
sayyadakhatoon@rediffmail.com

**Dr. (Mrs) Tanuja** is presently the Head of the Department of Botany, B.M.D College, Dayalpur, Vaishali. Her areas of research interests are Medicinal and Aromatic Plants, Environmental Microbiology and Fermentation Technology. She did her PhD from Magadh University. She has 18 years of teaching experience. She was a Visiting Scientist at the Research Centre of Mahavir Cancer Sansthan, Patna, Bihar. She has been the convener of the U.G.C sponsored seminar on "Cultivation of Aromatic and Medicinal Plants in Bihar" and is actively engaged in the University Grants Commission funded research projects. She contributes regularly to the professional literature of National and International status and more than thirty papers/articles to her credit. She is the Associate Editor of Agrobios newsletter, published by Agrobios India, Jodhpur and has authored/co-authored several books.

E-mail: tantnj@yahoo.com

**Dr. Laxman P. Deshmukh** is a Reader in J.D.M.P.V.S. Arts, Commerce and Science College at Jalgaon, Maharashtra, India.

E-mail: lpdeshmukh30@rediff.com



## NEWS FLASH

**National Botanical Research Institute, Lucknow (NBRI)** has taken up a research programme on "Plant based management of Ganga water pollution" which is sponsored by National River Conservation Directorate, Ministry of Environment & Forests, Govt. of India, New Delhi. To initiate the project work and to ensure the involvement of local people, a team of NBRI scientists led by Dr. Rakesh Tuli, Director of the Institute,

inaugurated a constructed wetland at Matri Sadan Haridwar. It was followed by a one day workshop-cum-panel discussion on 24<sup>th</sup> November 2009 at Dev Sanskriti Vishwavidyalaya Haridwar to develop a road map for future programme.

The workshop was attended by professionals and individuals, officials of local boards, educational institutions,

industrial associations and voluntary and spiritual organizations concerned about the upkeep of the Ganga river.

The workshop involved local people who will be benefited by training and sensitization on the role of plants in improving the quality of Ganga water and providing opportunities for employment generation.

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The aim of the project is to promote this small-scale technology among the rural population as a model. As yet, whatever steps have been implemented to treat the sewage released into Ganga, only one-fourth of the sewage is treated before releasing in to the river. Until the people living on the river banks are

sensitized about this, it is not possible to achieve the desired result, says Dr. UN. Rai, Project Leader of the team of scientists.

**Dr. R.D. Tripathi**, Scientist & Group Leader, Bioremediation & Ecotoxicology Group of National Botanical

Research Institute, Lucknow and Organizing Secretary ICPEP-4 has been conferred 'Saryu Ratna Award' for his outstanding contributions towards the cause of Environmental Protection and Management by the Saryu Mahotasava Ayojan Samiti and Mukti Path Sewa Sansthan Barhalganj, Gorakhpur, India.

## OPAL: A UNIQUE NATIONAL PUBLIC PARTICIPATORY ENVIRONMENTAL MONITORING PROJECT

**J. Nigel B. Bell**

*Professor of Environmental Pollution, Centre for Environmental Policy,  
Mechanical Engineering Building, Imperial College, London, SW7 2AZ, UK.  
E-mail: n.bell@imperial.ac.uk*

In 2007 the Open Air Laboratories Project (OPAL) was established in England, as a unique 5 year programme involving the public in a wide range of environmental monitoring projects across the entire area of this part of the United Kingdom. While public participatory projects have been carried out in the UK previously, the scope, extent and duration of OPAL are on a scale far greater than any other exercise. Examples of past projects, which in some ways form a model for key parts of OPAL, are nation-wide surveys by school children of air and water pollution, using lichens and invertebrates, respectively, in the early 1970s, the results of which were published in the journal "Environmental Pollution." Other more recent examples some 20 years ago were carried out by school children measuring the acidity of rain and biomonitoring tropospheric O<sub>3</sub> with the sensitive tobacco cultivar, Bel – W3. In the early years of the present decade a major European Commission funded project, Eurobionet, performed a major biomonitoring programme for air pollutants, utilising a range of plant species in cities across a number of western and central European countries. While this did not involve direct public participation, it had a high profile in terms of raising the awareness of the general population of air pollution and its impacts.

The OPAL programme has extended

massively the scope of these earlier projects but incorporating much of their underlying philosophy. It is funded by the Big Lottery Fund, which awards grants for community based projects, using the profits of the UK National Lottery, which was established in 1994. The total value of the award is around £12,000,000, supporting the work of 15 partners and a total of 31 projects. The main partners are Imperial College Centre for Environmental Policy (CEP) and its close neighbour in London, the Natural History Museum (NHM). The OPAL objectives are:

- A change of lifestyle – a purpose to spend time outside observing and recording the world around us. The aim here is get over one million people more aware of their natural environment and how to protect it.
- An exciting and innovative educational programme that can be accessed and enjoyed by all ages and abilities. Thus through a range of new approaches to learning, people will become involved in natural history activities with consequent enhancement of their knowledge and understanding.
- A new generation of environmentalists. It is aimed to stimulate membership of natural history societies, including from under-represented sections of society.

- A much greater understanding of the state of the natural environment. This will ensure that everybody will have the opportunity to monitor the state of the natural environment and generate important scientific data on a vast scale. 'Some of the most disadvantaged communities will be helped to identify, quantify and highlight environmentally deprived spaces.'
- Stronger partnerships between the community, voluntary and statutory sectors. Scientists at 10 universities in different English regions, with the aid of specialist national centres, will build connections with individuals and organisations, which wish to improve local environments, aiming to involve over 500,000 people.

Central to the activities of OPAL are 5 national surveys which are being carried out sequentially over the life of the programme and overseen by a Biomonitoring Committee, of which I am the Chair. The first of these, led by Imperial College, is on soil quality and earthworm populations. This utilises a workbook and recording guide, carefully designed, (as in all 5 surveys), by the Field Studies Council, for use by the non-specialist in a laminated form suitable for use under field conditions in the wet English climate! It contains a key to 12 common earthworm species, indicator papers for pH measurement

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and instructions for a simple set of soil quality tests, including porosity, compaction and particle size/distribution. After a number of pilot studies, with subsequent modification of the pack, the survey was launched in March 2009. Results are entered by the participants into a web-site (as for the other surveys), which is continuously updated and which can be interrogated by the public to determine the current distribution of records. The data are being analysed statistically, seeking relationships between worm populations and soil characteristics. At the same time they are being subjected to rigorous quality assurance procedures to ensure the validity of the data, which will be sufficiently robust for publication in international refereed journals.

The remaining 4 surveys follow essentially the same pattern as for the soil quality/earthworms. The second survey on air quality is also led by Imperial College and was launched in September 2009. This consists of two parts. Firstly the lichen flora of the trunks and twigs of free-standing trees is surveyed, concentrating on 9 species – 3 nitrogen-loving, 3 nitrogen-sensitive and 3 which are intermediate, which will be related to the air quality at the sites of investigation, thus following the long-established practice of lichen biomonitoring, but taking into account recent changes in air pollution characteristics. The second part is a survey of tarspot of sycamore, which is a fungal disease infecting the leaves that have been shown to be adversely affected by both SO<sub>2</sub> and NO<sub>2</sub>. This involves counting the number of tarspots per leaf and calculating a tarspot index, based on leaf size, which can then be related to the prevailing air quality. The third survey on water quality is led by University College London and will be launched in May 2010. It involves estimates of invertebrate species and tests for water clarity and pH. The Open University (distance learning) will run the Biodiversity Survey, which will start in September 2010. It is closely

associated with the OPAL funded Open University's Biodiversity Observatory ("iSpot), which is an online social networking site, connecting beginners to experts. The final element, the Climate Survey run from the Meteorological Office, will commence in March 2011. The exact nature of this is still being worked out, but suggestions include chasing soap bubbles to record wind characteristics.

In addition to the surveys, centres have been set up in Air, Soil and Climate Change (Imperial College), Water (University College London) and Biodiversity (Open University). These act as focal points for research into these areas, with a high level of public interaction, as well as the relevant national surveys. In view of the requirement for OPAL activities other than the surveys to cover all of England, 9 regional centres have been set up in local universities, which address different environmental issues, of particular interest to the regions concerned. Thus the University of Hertfordshire concentrates on the ecology of orchards, covering the East Anglia region; Imperial College covers impacts of road traffic pollution in South East England and the characteristics of the urban climate of London; University of Nottingham studies heathlands, particularly the deleterious effects of nitrogen deposition; University of Birmingham concentrates on the environment of urban green spaces; University of Plymouth covers effects of pollution on woodlands; University of York concentrates on a wide range of environmental activities in Yorkshire and Humberside, with the University of Newcastle-on-Tyne having a similar broad range of activities in North East England; University of Central Lancashire operates in North West England and concentrates on people's experience, especially of communities which have not had the opportunity previously to explore the delights of nature. All these regional centres employ community scientists who are

involved in a very wide range of outreach activities.

OPAL has not yet reached its halfway stage and, indeed, has only recently held its first annual conference. However, there is every indication that it is proving to be an outstanding success, amply fulfilling its original objectives. Thus all stakeholders are benefiting, including academics, who are receiving a vast amount of original data which will be published in the scientific literature. The survey packs are immensely popular and are being progressively refined with each new survey, in view of experience. Amateur societies are being encouraged, with a programme of grants being awarded and the recent formation of the first Earthworm Society of Britain. However, the most pleasing aspect is the keen involvement of many marginalised and disadvantaged groups, such as handicapped children and adults, black and ethnic minorities, the long term unemployed and even prisoners. Thus many people are encountering nature for the first time and learning new skills, not the least in plant and animal identification, which hopefully will lead to opportunities of employment, filling the gap left by the decline in taxonomy teaching in UK universities at a time when the demand for field ecologists is growing rapidly.

While the OPAL programme is restricted to England, there is considerable interest elsewhere in the UK and I feel that it can form the model for transfer to other countries. As has been discussed previously in *EnviroNews*, biomonitoring is particularly suitable for use in the developing world and I would love to see an OPAL scheme developed in India and elsewhere. Finally, I would like to pay tribute to all the members of the OPAL team, but in particular to its Director, Dr. Linda Davies, whose idea it was entirely, arising out of her PhD research under my supervision into the effects of changing air quality on London's lichen flora.

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## IMPACT OF GLOBAL CLIMATE CHANGE ON FLORICULTURE IN INDIA

S.C. Sharma\* & R.K. Roy\*\*

\*Former Head, Botanic Garden & Floriculture and Emeritus Scientist (CSIR),  
National Botanical Research Institute, Lucknow-226001.  
E.Mail:scsharmagardener@gmail.com

\*\*Sr. Scientist (Floriculture), Botanic Garden Division,  
National Botanical Research Institute, Lucknow-226001.  
E. mail: roynbri@rediffmail.com

Climate change is one of the most important global environmental challenges in the history of mankind. It is mainly caused by increasing concentration of Green House Gases (GHGs) in the atmosphere. In 1980s, scientific evidences linking GHGs emission due to human activities causing global climate change, started to concern everybody. Subsequently, United Nations General Assembly in 1992 formed Intergovernmental Negotiating Committee for Framework Convention on Climate Change (UNFCCC) which finally adopted the framework for addressing climate change concerns.

The Intergovernmental Panel on Climate Change (IPCC) has been publishing periodic assessment reports on atmospheric carbon concentration and its likely impact on the environment. The IPCC in its 4<sup>th</sup> Assessment Report states that emission of global GHGs has increased since pre-industrial times, with an increase of 70% between 1970 and 2004. The big challenge before the international community is to limit the emission of green house gases by 2050 and measurably by 2020.

Climate of the planet earth is always in a state of change as a natural process influenced by both natural variability and induced environmental changes due to anthropogenic reasons. Natural causes include continental drift, volcanoes, earth's tilt, and ocean current while human causes are GHGs, agricultural practices, energy sources, waste disposal, depleting forest cover, etc. However, the reason for worry is that climate change is taking place at a much faster rate than expected by the human interference. The consequences

of such rapid change are - global warming, change of seasonal pattern, excessive rain, melting of ice cap, flood, rising sea level, drought, etc. leading to extremity of all kinds. The implications will be wide spread but specially on the food production (agriculture/horticulture), forest ecosystem, health, energy, etc. Vulnerability, rarity and rapid extinction of plant species will be among other consequences.

Plants are key components of the ecosystem and are greatly influenced by climatic and geographical factors. Therefore, climate change has a direct impact on agriculture and horticulture as the basic factors for crop production are being influenced. Overall, a low production of horticultural crops is feared due to the climate change. Assuming a global temperature rise of 4.4°C by 2080 over the cultivated areas, India's agricultural output is projected to fall by 30-40% which would be quite alarming unless proper remedial measures are taken. Further, occurrence of new diseases, pests together with severity of the existing ones is also foreseen. Some of the well established commercial varieties of fruits, vegetables and flowers will perform poorly in an unpredictable manner.

### Floricultural Scenario

India is becoming a strong centre of commercial floriculture in the international market. During the last 5-7 years, there was a great surge in the floricultural activity in the production of flowers (cut and loose), ornamental plants (potted and cut-greens) and dry flowers (value added products), besides marketing. The horticultural sector contributed around 28% of the GDP annually from 13.08% of the area and

37% of the total exports of agricultural commodities (2004-05).

Albeit, India's present contribution in the global floricultural export market is negligible (about 0.4%) as compared to Netherlands (58%), Columbia (14%), Ecuador (7%), Kenya (5%), Israel (2%), Italy (2%), Spain (2%) and others 10%, it is not far when India will come up as a major grower/exporter by virtue of well planned policies formulated by the Government of India backed with foreign technologies for green house production.

### Impact of Climate Change on Floriculture

The impact of climate change on flowering plants and crops will be more pronounced. Melting of ice cap in the Himalayan regions will reduce chilling required for the flowering of many of the ornamental plants like Rhododendron, Orchid, Tulipa, Alstromerea, Magnolia, Saussurea, Impatiens, Narcissus etc. Some of them will fail to bloom or flower with less abundance while others will be threatened. Indigenous species in the natural habitat will be under threat for not getting favourable agro-climatic conditions for their proliferation. Western Ghats and surrounding regions may be deprived of normal precipitation due to abnormal monsoon. Plant species requiring high humidity and water may find them under difficult conditions for survival. Plains of India will also have similar kind of problems and will be affected either by drought or excessive rains, floods and seasonal variations.

Commercial production of flowers particularly grown under open field conditions will be severely affected

leading to poor flowering, improper floral development and colour besides reduction in flower size and short blooming period.

### Future Strategies

In view of these problems, horticulturists will have to play a significant role in the climate change scenario and proper strategies have to be envisaged for saving horticulture/floriculture from future turmoil. The most effective way to address climate change is to adopt a

sustainable development pathway, besides using renewable energy, forest and water conservation, reforestation etc. Awareness and educational programmes for the growers, modification of present horticultural practices and greater use of green house technology are some of the solutions to minimize the effect of climate change. Hi-tech horticulture is to be adopted in an intensive way. It is necessary that selection of plant species/cultivars is to be considered keeping in view the effects of climate change. The perfor-

mance of different seasonals may not be satisfactory due to shorter and warmer winter. Judicious water utilization in the form of drip, mist and sprinkler will be a key factor to deal with the drought conditions. Development of new cultivars of floricultural crops tolerant to high temperature, resistant to pests and diseases, short duration and producing good yield under stress conditions, will be the main strategies to meet this challenge.

## PYXINE COCOES NYL. - A FOLIOSE LICHEN AS A POTENTIAL BIOINDICATOR/BIOMONITOR OF AIR POLLUTION IN PHILIPPINES: AN UPDATE

**Isidro T. Savillo**

*Professor of Lichenology*

*P.O. Box 203, Iloilo City, Philippines 5000*

*E-mail: lichens\_2001@yahoo.com*

In the 1990s, literatures identifying pollution tolerant lichens have started to proliferate. In Europe, a lichen known as *Lecanora conizaeoides* hit the limelight by being recognized as pollution tolerant lichen against sulfur dioxide, one of the most notorious atmospheric pollutants.

However in Asia, there was no specific pollution tolerant lichen that can be used to gauge the environment's air pollution index. Therefore, in the present study, common growth of lichens common in an urban area in the

Philippines were examined. A foliose lichen known as *Pyxine cocoes* (Swartz) Nyl. (Physciaceae) was identified to be the most abundant common species in the busy district parks of the Iloilo city including a church yard. This species is recommended as a possible bioindicator for atmospheric pollution. Six years after this report, W. Gruezo a lichenologist from the University of the Philippines Los Banos and his team reported the ubiquitousness and abundance of *P. cocoes*. Their study area spanned four Metro Manila sites and two sites near and around coal fired

power plants, where they concluded that the lichen *P. cocoes* as being abundant and ubiquitous in all their six study sites. Hence they considered it as potential biomonitor for atmospheric pollution after analyzing the samples for several air pollution related elements using x-ray fluorescence spectrometry. This finding has supported the first pioneering report of the present author in 2003 in the Philippines regarding the common abundance of this lichen and its usefulness in determining atmospheric pollution.

### ICPEP-4 Registration Fee Schedule

Category	Indian/SAARC Residents*		Foreign Nationals/NRIs	
	Up to 31.07.2010	After 31.07.2010	Up to 31.07.2010	After 31.07.2010
Members of ISEB	Rs. 2500	Rs. 3500	US \$ 350	US \$ 400
Non Members	Rs. 3000	Rs. 4000	US \$ 400	US \$ 450
Students	Rs. 1500	Rs. 2500	US \$ 150	US \$ 200
Accompanying person	Rs. 1500	Rs. 2500	US \$ 175	US \$ 225

### ISEB Membership Fee Schedule

Patron Member	Rs. 15,000.00	US \$ 1000	Payable once only
Life Member	Rs. 3,000.00	US \$ 350	Payable once only
Institutional Member	Rs. 3,000.00	US \$ 300	Per year
Annual Member	Rs. 300.00	US \$ 50	Per year
Student Member	Rs. 200.00	US \$ 20	Per year

\*Post Docs are not eligible for student membership.





## LOBSTERS SUPERSIZED BY CLIMATE CHANGE

More acidic oceans, a consequence of rising atmospheric carbon dioxide (CO<sub>2</sub>) levels, can produce jumbo-size shelled marine species, including lobsters, crabs, and shrimp according to a study carried out by scientists of the University of North Carolina at Chapel Hill, U.S.A. However it is not true with all sea creatures and oysters, scallops, and clams suffered more acidic waters because they had more trouble building their shells. The researchers grew 18 species of shelled marine animals in conditions that mimicked the elevated CO<sub>2</sub> levels predicted in Earth's atmosphere over the next two centuries. The lobsters and other animals that thrived under higher CO<sub>2</sub> levels during the experiment are better able to convert the inorganic carbon in sea water into a form they can use to produce shells.

The research team also found that some species, such as calcifying algae, benefited from increased CO<sub>2</sub> up to a point—and then quickly began to experience problems building their shells. This may illustrate a specific CO<sub>2</sub> "tipping point," which could be identified and monitored in future studies.

**Brian Handwerk**  
in *National Geographic News*

## JET CONTRAILS BLOCK SUNSHINE

Vapour trails caused by jet aircraft over Britain can cause clouds covering 20,000 square miles, according to Met office research. Analysis of contrails from large military aircraft circling over the North Sea showed the creation of a thin layer of cloud, at its peak, covered an area more than 20,000 square mile. The Met office research suggests that the collective impact of hundred of vapour trails can cause a blanket of thin cloud, reducing sunshine for millions who live under busy flight paths.

## NEWS AND VIEWS

Contrails, which are clouds of condensed water vapour and soot particles made by the exhaust of jet engines, sometimes disperse within minutes but can also be present in the sky for many hours. They can also act as a catalyst for the formation of further wispy cirrus cloud.

Globally, vapour trails are thought to cut sunshine levels by less than one per cent, but this figure could rise to 10 per cent in areas under busy air corridors, such as the south-east of England.

**Alastair Jamieson**  
*Times*

## 2010 TO BE HOTTEST YEAR EVER

2010 is likely to be World's warmest year on record, predicted British Met Office. Man-made climate change will be a factor and natural weather patterns would contribute less to 2010's temperature than they did in 1998, the current warmest year in the 160 years record. While EL Nino effect, the cyclical heating of the Pacific Ocean is much weaker than it was in 1998, the warming effect of green house gas emissions will more than make up the difference.

It is predicted that the global average temperature in 2010 will be about 0.6 °C warmer than the 1961-1990 average and annual average will be 14.56 °C. It is also expected that half the years between 2010 and 2019 will be warmer than 1998.

*London Times*

## DIATOMS REVEAL CLIMATE CHANGE

Knowledge of how the climate has varied in the past is necessary if we are to understand the causes and mechanisms behind today's climate changes. Using diatoms in sediments from Swedish mountain lakes, a team of scientists from Stockholm University has studied changes in atmospheric circulation.

Northern Sweden is sensitive to changes in atmospheric circulation since the region is affected by air masses of differing origin from the North Atlantic, the Baltic, and the Arctic. Depending on which air mass dominates, the temperature and the amount of precipitation changes.

Changes in precipitation in turn influence the oxygen content of lake water and are picked up by tiny diatoms living in the lakes. Shells from these algae are preserved in the sediment on the bottom of the lake and can be analyzed to reveal changes in circulation and variation in climate since the latest ice age, that is, during the last 10,000 years.

*Science Daily*

## PAPER FROM ELEPHANT EXCRETA

The use of handmade paper is catching on as people realize that ordinary paper means cutting more trees – 17 trees go into making one tonne of paper. Handmade paper uses waste material such as dung. Elephant dung is considered the best because it has a lot of fibre. An elephant excretes more than half of all that it eats, so the fibres are soft and long. An elephant eats about 200 kg of food every day and generates upto 50 kg of dung, which is enough to make 15 sheets of paper.

The paper may be brown but actually very 'green' as no bleach is used to whiten the paper. The mix is 80% dung and 20% cotton rag. In making the paper the dung is washed, boiled, disinfected and dried. Then it is beaten into a pulp and mixed with water and dried flat into paper.

All kinds of waste can be used – from hosiery, rice, jute, silk, etc. Banana trunk paper is fine and is used to make lampshades. The paper making industry is becoming increasingly agro-based rather forest based.

**Shobha John**  
in *Times of India*

## PARTICLES FROM CAR BRAKES HARM LUNGS

Particles released by cars when they brake have been found to cause damage to lung cells. Researchers at the University of Bern and the Institute of Health in Switzerland found that in laboratory tests the metals in brake wear particles can damage junctions between cells. Despite being responsible for 20 per cent of all traffic emissions, the health implications of brake wear have not been studied.

In the study, 'Toxic effects of brake wear particles on epithelial lung cells in vitro', researchers found that brake wear particles contained large amount of iron, copper and organic carbon.

It was exposure to these pollutants that caused the damage and inflammation to the cells. Researchers found that particles were still released even when the brakes were not being applied, indicating residual brake particles were being released from the turning axle and the braking system.

This finding underscores the importance of reducing brake particle emissions at the same time as exhaust particles.

**Ecologist**

## IMPACTS OF CLIMATE CHANGE ON MENTAL HEALTH

Leading mental health researchers are warning that some of the most important health consequences of climate change will be on mental health and these effects will be felt most by those with pre-existing serious mental illness. There is an urgent need to undertake research into the mechanism that causes the damaging effects of climate change on mental health.

Natural disasters, such as floods, cyclones and droughts are predicted to increase as a consequence of climate change. Adverse psychiatric outcomes are well documented in the aftermaths of natural disorders and include post-traumatic stress disorders. As global temperature increases, people with mental illness are particularly vulnerable to heat related death. In addition, maladaptive coping

mechanisms and poor quality housing are likely to further increase vulnerability, and death by suicide may also increase above a certain temperature threshold. Adverse impacts such as psychological distress, anxiety and traumatic stress resulting from emerging infectious disease outbreaks are also likely to increase.

**Science Daily**

## DESTRUCTION OF RAINFORESTS

We are losing upwards of 80,000 acres of tropical rain forest daily and degrading another 80,000 acres of land every day. Some 135 plant, animal and insect species – or some 50,000 species a year are lost as the forests fall.

Tropical rainforests are incredibly rich ecosystems that play a key role in the basic functioning of the plants. They help maintain the climate by regulating atmospheric gases and stabilizing rain forests, and provide many other important ecological functions.

Rainforests are also home to some 50 per cent of world's species. A quarter of our modern pharmaceuticals are derived from rainforest ingredients, but less than one per cent of the trees and plants in the tropics have been tested for curative properties. We don't really know the true value of what we are losing as we slash, burn, and plant over what was once a treasure trove of biodiversity. According to the FAO, overall tropical deforestation rates this decade are 8.5 per cent higher than during the 1990s.

Despite increased public awareness on the importance of tropical rainforests, deforestation rates are actually on the rise, mostly due to activities such as commercial logging, agriculture, cattle ranching, dam-building and mining, but also due to subsistence agriculture and collection of the wood.

**Earth Talk**

## CLEANING OIL FROM WATER

Small amounts of oil leave a fluorescent sheen on polluted water. Oil sheen is hard to remove, even when the

water is aerated with ozone or filtered through sand. Now scientists at the University of Utah have developed an inexpensive new method to remove oil sheen by repeatedly pressurizing and depressurizing ozone gas, creating microscopic bubbles that attack the oil so it can be removed by sand filters.

The method uses two existing technologies - ozone aeration and sand filtration - and adds a big change to the former. Instead of just bubbling ozone through polluted water, repeated cycles of pressurization of ozone and dirty water are used, so the ozone saturates the water, followed by depressurization so the ozone expands into numerous microbubbles in the polluted water, similar to the way a carbonated beverage foams and overflows if opened quickly.

The tiny bubbles provide much more surface area – compared with larger bubbles from normal ozone aeration – for the oxygen in ozone to react chemically with oil. Pollutants tend to accumulate on the bubbles because they are not very water-soluble. The ozone in the bubble attacks certain pollutants because it is a strong oxidant.

The reactions convert most of the dispersed oil droplets – which float on water to cause sheen – into acids and chemicals known as aldehydes and ketones. Most of those substances, in turn, help the remaining oil droplets clump together so they can be removed by conventional sand filtration.

This study shows that the new method not only removes oil sheen, but also leaves the treated water so that any remaining acids, aldehydes and ketones are more vulnerable to being biodegraded by pollution-eating microbes. These are much more biodegradable than the parent compounds.

The water is clean enough to be discharged after the ozonation and sand filtration, but that some pollution sources may want to use conventional methods to biodegrade remaining dissolved organic material.

**Science Daily**

**SUMMIT WILL  
CREATE 46,000 TONNES OF CO<sub>2</sub>**

The Copenhagen climate talks will generate more carbon emissions than any previous climate conference.

Delegates, journalists, activists and observers from almost 2000 countries have gathered at the Dec 7-18 summit and their travel and work will create 46,200 tonnes of carbon dioxide, most of it from their flights. This would fill nearly 10,000 Olympic swimming pools, and is the same amount produced each year by 2,300 Americans or 660,000 Ethiopians. Despite efforts by the Danish government to reduce the conference's carbon foot-print, around 5,700 tonnes of carbon dioxide will be created by the summit and a further 40,500 tonnes created by attendees' flights to Copenhagen. The figure for the flights was calculated by the United Nations Framework Convention on Climate Change (UNFCCC), while the domestic carbon footprint from the summit was calculated by accountants Deloitte, and Deloitte consultant Stine Balslev.

This is much bigger than the last talks because there are many more people and 18,000 people were expected to pass through the conference every day.

These are preliminary figures but we expect that when we do the final calculations after the conference is over, the carbon footprint will be about the same.

Deloitte included in their calculations emissions caused by accommodation, local transport, electricity and heating of the conference centre, paper, security, transport of goods and services as well as energy used by computers, kitchens, photocopiers and printers inside the conference centre.

**Reuters**

**OZONE HOLE PROTECTING  
ANTARCTICA FROM GLOBAL WARMING**

Antarctica has been protected from the affects of global warming by the impacts of another environmental disaster – the hole in the ozone layer according to a recent study by experts at the International Scientific Committee on Antarctic Research. According to them, the ozone layer has changed south polar weather systems.

Westerly winds over the Southern Ocean have intensified by about 15 per cent isolating Antarctica from the warming elsewhere on the planet. As a result, during the past 30 years there has

been little change in surface temperature over much of the vast continent, though west Antarctica has warmed somewhat. The most astonishing evidence is the way that one man-made environmental impact – the ozone hole – has shielded most of Antarctica from another – global warming.

For years, climate change scientists have been puzzling over why most of the Antarctic has shown relatively little warming and why in some areas the ice cover has, in fact, been increasing. The Financial Times reported.

The failure of the Antarctic to melt across most of its extent – in sharp contrast to the Arctic where the decline of sea ice and the melting of Greenland's glaciers have been well-documented – has been held up by climate change skeptics as evidence of how global warming is not that serious.

The report further said that when the hole in the layer closes up – which it is doing, as the ozone depleting chemicals that caused it are phased out – temperatures are expected to rise across most of the continent by only about .3 degrees Celsius which will not be enough to melt the main ice sheet.

**PTI, London**

**\*ISEB WEBSITE – VISITS FROM ACROSS THE GLOBE**

**(January 2008 – December 2009)**

**COUNTRIES**

Algeria	Czech Republic	Iraq	Nepal	Spain
Antigua and Barbuda	Denmark	Ireland	Netherlands	Sri Lanka
Argentina	Egypt	Israel	New Zealand	Sudan
Australia	Ethiopia	Italy	Nigeria	Sweden
Austria	European country	Ivory Coast (Cote D'Ivoire)	Norway	Switzerland
Azerbaijan	Fiji	Jamaica	Oman	Syria
Bangladesh	Finland	Japan	Pakistan	Taiwan
Belarus	Former Czechoslovakia	Jordan	Palestinian Territories	Tanzania
Belgium	France	Kenya	Philippines	Thailand
Benin	Gambia	Kuwait	Poland	Togo
Bosnia-Herzegovina	Germany	Latvia	Portugal	Trinidad and Tobago
Botswana	Ghana	Lebanon	Puerto Rico	Tunisia
Brazil	Great Britain	Libya	Qatar	Turkey
Bulgaria	Greece	Lithuania	Romania	Uganda
Burkina Faso	Guatemala	Macedonia (FYROM)	Russian Federation	Ukraine
Cameroon	Guyana	Malaysia	Saudi Arabia	United Arab Emirates
Canada	Haiti	Mali	Senegal	United States
Chile	Hong Kong	Malta	Singapore	Venezuela
China	Hungary	Mauritius	Slovak Republic	Vietnam
Colombia	India	Mexico	Slovenia	Zambia
Costa Rica	Indonesia	Moldova	South Africa	
Croatia	Iran	Morocco	South Korea	
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\*ISEB Website: <http://isebindia.com>



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Contact: Prof. Arun Arya The Maharaja Sayajirao University of Baroda, Vadodara-390002, India  
E-mail: aryaarunarya@rediffmail.com; vspatel\_usa@yahoo.com  
Coordinator Environmental Science Programme & Head, Department of Botany

### International Conference on Climate Change and Developing Countries

19-22 February 2010; Kottayam, Kerala, India  
Contact name: Dr.C.T.Aravindakumar  
Website: <http://www.ceetindia.org>

### 2010 International Conference on Environmental Science and Technology (ICEST-2010)

23-25 April 2010; Bangkok, Thailand  
Contact name: Conference Secretary  
E-mail: icest@vip.163.com  
Website: [www.icest.org](http://www.icest.org)

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28-29 April 2010; London, United Kingdom  
Contact name: Lauren Goozee  
Website: [http://www.ciwem.org/events/annual\\_conference/](http://www.ciwem.org/events/annual_conference/)

### Environmental Toxicology 2010

Third International Conference on Environmental Toxicology  
4-6 May 2010; Limasoll, Cyprus  
Website: <http://www.wessex.ac.uk/10-conferences/environmental-toxicology-2010.html>

### 5th Annual International Symposium on Environment

20-23 May 2010; Athens, Greece  
Contact name: Dr. Theophilos Theophanides  
Website:

### Urban Environmental Pollution

20-23 June, 2010; Boston, MA, U.S.A.  
Contact name: Gert-Jan Geraeds  
Website: <http://www.uep2010.com/index.asp>

### 2nd International Conference on Climate Change: Impacts and Responses

8-10 July 2010; University of Queensland, Brisbane, Australia  
Contact: Common Ground Publishing  
University of Illinois Research Park  
600 Hazelwood Dr., Suite 226, Champaign, IL 61820, U.S.A.  
E-mail: [support@on-climate.com](mailto:support@on-climate.com)

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12-14 July 2010; Tallinn, Estonia  
Contact name: Alice Jones  
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19-23 September 2010; Amsterdam RAI, the Netherlands  
E-mail: [ghgt10@ghgt.info](mailto:ghgt10@ghgt.info)

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Tel. 2297821: 2205831-35 Extn. 821  
Fax : 2205836  
E-mail : [isebnbrilko@sify.com](mailto:isebnbrilko@sify.com)  
Website : <http://isebindia.com>