

## Unravelling climate change

Hurricane Hannah hit Haiti and Ike struck the Texas Gulf coast, as the Atlantic Ocean continues to churn more storms, leaving people dead and displaced. Back home, it was the overflowing Kosi river that had displaced 25 lakh people in Bihar and 12 lakh in Assam. 'Climate change' is gradually morphing into a gruesome reality. India along with its North West Frontier neighbours and sub-Saharan Africa is at a disadvantage regarding natural calamities due to its social, economic and demographic fabric. Fluctuating climatic conditions are likely to cause heavy rainfall and droughts<sup>1</sup>, affecting the productivity of farmers in Asia and Africa. Approximately, two-thirds of India's population depend directly on the climate-sensitive zone for their survival<sup>2</sup>. An alteration in climate is likely to have heavy consequences on all the natural ecosystems, thereby affecting the socio-economic systems<sup>3</sup>.

The oft-quoted blame on anthropogenic changes for inducing global warming has been authenticated in a study<sup>4</sup> at NASA's Goddard Institute for Space Science in New York. The scientists correlated temperature-related changes in all the continents with responses in physical and biological systems. Changes in natural systems as well as those in regional climate were attributed to anthropogenic warming. The 'joint attribution' method was used to link climate models with statistical models to simulate changes in natural systems and compare them with the observed changes in natural systems. Observed changes in the Arctic and Canada were consistent with the response

due to anthropogenic climate change. However, the retreat of two glaciers in Switzerland and Norway could not be explained by natural variability.

Data ranging from 1970 to 2004 were analysed to study multiple physical and biological systems at a global and continental scale. Maximum temperature-related changes were seen in Europe, North America and North Central Asia, with least responses observed from Latin America, Africa and Australia. The lesser magnitude of warming as seen in the latter regions was thought to be caused by large-scale climate variations than due to anthropogenic factors. Of the 829 documented physical changes, 95% was coherent with warming events such as glacier melt and earlier spring river peak. Phenological plant changes such as leaf unfolding, early blooming and change in migration patterns of animals accounted for 90% of the staggering 28,800 documentations in the biological systems.

Among other drivers of environmental change, land-use change is said to indirectly affect the physical and biological systems through climate. The Fourth Assessment Report of the IPCC Working Group found that since the mid-twentieth century, the increase in global temperature is likely due to increase in anthropogenic greenhouse gas concentrations and concluded that significant warming over the past fifty years occurred in each continent, except Antarctica<sup>5</sup>.

However, the synthesis of a huge amount of data to quantify the climate impact has aggravated fears among

experts, terming it a rather difficult task<sup>6</sup>. The 'spatial congruence' statistic that assumes local climate changes are confined to that region may not be able to enumerate biological impacts arising from remote climate changes. They emphasize that to determine the magnitude of anthropogenic contribution, it is necessary to undertake direct attribution of the causes of change in the affected systems rather than using a two-step joint attribution system that ascribes climate change to external influence and alterations in physical and biological system. Hence, an end-to-end modelling system that gives a holistic view on climate change is required.

1. [www.who.int/global\\_change/climate](http://www.who.int/global_change/climate).
2. Sathaye, J., Shukla, P. R. and Ravindranath, N. H., *Curr. Sci.*, 2006, **90**, 314–325.
3. Report, Ministry of Environment and Forests, New Delhi, 2004.
4. Rosenzweig, C. *et al.*, *Nature*, 2008, **453**, 353–357.
5. IPCC, In *Climate Change 2007: The Physical Science Basis* (eds Solomon, S. *et al.*), Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, Cambridge, 2007.
6. Ziviers, F. and Hegerl, G., *Nature*, 2008, **453**, 296–297.

**Neelam Pereira** (*S. Ramaseshan Fellow*), c/o Dr Abhijit Mazumder, NCAOR, Headland Sada, Goa 403 804, India.  
e-mail: neelam.pereira@gmail.com

## RT-PCR technique for rapid detection of CHIK virus

Chikungunya is a viral disease caused by the Chikungunya (CHIK) virus, which is an alphavirus belonging to the family Togaviridae. CHIK virus is transmitted to humans by various *Aedes* mosquito species. It causes an acute disease which can be fatal. It was first reported in India in 1963 and caused an epidemic<sup>1</sup> here in 2005.

The CHIK virus infection has many similarities with that of dengue virus. Hence its identification was a problem,

resulting in delayed control measures. Earlier, virus isolation and serological testing were the two methods to detect the virus. But both the methods are time-consuming, expensive and sophisticated<sup>1</sup>.

Joseph *et al.*<sup>1</sup> (Molecular Biology Laboratory, SCMS Institute of Bioscience and Biotechnology Research and Development, Cochin) have developed a new, simple, more sensitive and fast method for detection and characterization of

CHIK virus in human serum samples collected from febrile patients during a recent outbreak of viral infections in Kerala. The method is called RT-PCR.

The RT-PCR technique requires no high-precision instrument except a PCR machine. No viral culture for RNA extraction is required; rather RNA is isolated directly from 200 µl of the patient's serum. Joseph *et al.*<sup>1</sup> performed RT-PCR amplification of the viral RNA using two

different primer pairs specific for the envelope glycoprotein (*E1*) and non-structural protein (*nsP1*) genes of the CHIK virus. The RT mixture was used to synthesize and amplify cDNA, which was then sequenced for phylogenetic analysis.

The entire RT-PCR procedure takes less than 4 h. Joseph *et al.* detected chi-

kungunya in five out of 20 samples of serum. According to them, RT-PCR is even more sensitive than ELISA, detecting three samples CHIK-positive which were earlier ELISA-negative.

Thus, RT-PCR is a cheaper but powerful tool for the detection and characterization of CHIK viral infection, helping in the prompt and effective clinical

management of the disease in developing countries.

1. Joseph *et al.*, *Indian J. Exp. Biol.*, 2008, **46**, 573–578.

**Abhay S. D. Rajput**

## 2008 Shanti Swarup Bhatnagar prizes

The Ministry of Science and Technology, Government of India has recently announced the winners of the 2008 Shanti Swarup Bhatnagar (SSB) Award for science and technology. The SSB prizes comprising a citation, a plaque and a cash award of Rs 500,000 are given every year to scientists below 45 years of age. The SSB prize winners for 2008 are as follows.

Biological Sciences: G. P. S. Raghava, Institute of Microbial Technology, CSIR, Chandigarh and L. S. Shashidhara, Cen-

tre for Cellular and Molecular Biology, CSIR, Hyderabad.

Chemical Sciences: Pradeep Thappil, Indian Institute of Technology, Madras and Jarugu Narasimha Moorthy, Indian Institute of Technology, Kanpur.

Earth, Atmosphere, Ocean and Planetary Sciences: P. N. Vinayachandran, Indian Institute of Science, Bangalore.

Engineering Sciences: Ranjan Kumar Mallik, Indian Institute of Technology, Delhi.

Mathematical Sciences: Jaikumar Radhakrishnan, Tata Institute of Fundamental Research, Mumbai.

Medical Sciences: Ravinder Goswami, All India Institute of Medical Sciences, New Delhi.

Physical Sciences: Raghunathan Sri-anand, Inter-University Centre for Astronomy and Astrophysics, Pune and Srikanth Sastry, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore.

**Abhay S. D. Rajput**

## CSIR Young Scientist and CSIR Technology Awards 2008

The CSIR Young Scientist Awards for the year 2008 and CSIR Technology Awards 2008 under various categories were given away by the Union Minister for Science & Technology and Earth Sciences, Kapil Sibal on the occasion of the 66th CSIR Foundation Day in New Delhi.

The 2008 CSIR Young Scientist awardees under the different categories are as follows.

Biological Sciences: Beena Pillai, Institute of Genomics and Integrative Biology, Delhi.

Chemical Sciences: Subhash Ghosh, Indian Institute of Chemical Technology, Hyderabad, and Melepurath Deepa, National Physical Laboratory, New Delhi.

Earth, Atmosphere, Ocean and Planetary Sciences: Sinai Khandeparker Lidita

Dilip, National Institute of Oceanography, Goa and Simanchal Padhy, National Geophysical Research Institute, Hyderabad.

Engineering Sciences: Ranjan Kumar Sahu, National Metallurgical Laboratory, Jamshedpur and Satyajit Vishnu Shukla, National Institute for Interdisciplinary Science and Technology, Thiruvananthapuram.

Physical Sciences: Pankaj Poddar, National Chemical Laboratory, Pune.

The winners of the CSIR Technology Awards 2008 are:

Life Sciences: 'Team CCMB' of the Centre for Cellular and Molecular Biology, Hyderabad won this award for developing a polymerase chain reaction-based novel, universal technique for forensic applications.

Innovation: 'Team CDRI' of the Central Drug Research Institute, Lucknow won this award for discovering guggulsterone and developing analogues with a novel mechanism of action as hypolipidemic agents.

Business Development and Technology Marketing: 'Team URDIP' of the Unit for Research and Development of Information Products, Pune won this award for creating a niche in the knowledge-based service sector.

**Abhay S. D. Rajput** (*S. Ramaseshan Fellow*), H. No. 59, L. No. 1, Munshi Chak, Opp. Old Chungi, Camp Road, Talab Tillo, Jammu 180 002, India.  
e-mail: abhaysdr@yahoo.co.in