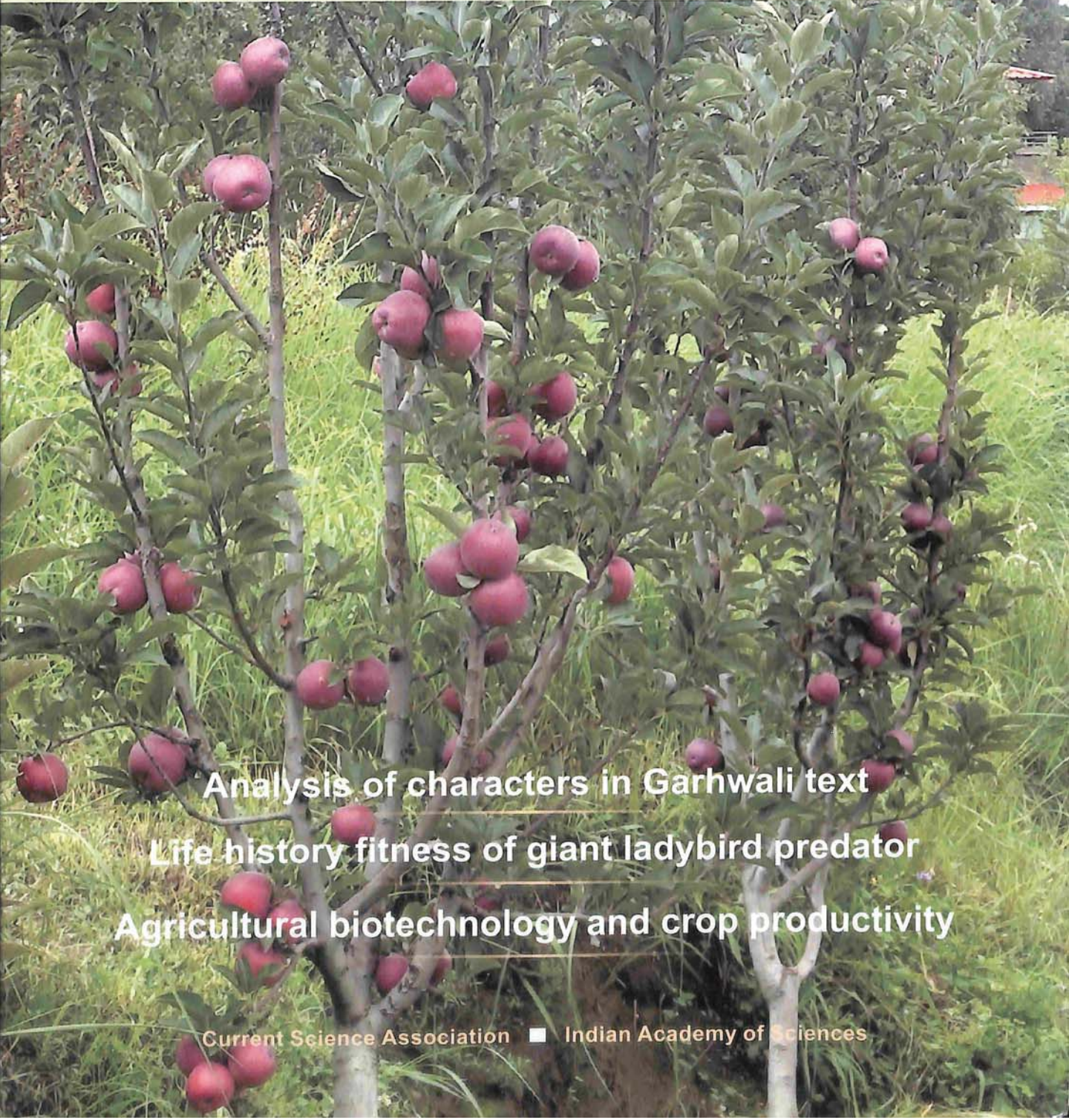


# CURRENT SCIENCE

Volume 110 Number 3

10 February 2016



**Analysis of characters in Garhwali text**

**Life history fitness of giant ladybird predator**

**Agricultural biotechnology and crop productivity**

# CURRENT SCIENCE

Volume 110 Number 3

10 February 2016

---

**282 In this issue**


---

**GUEST EDITORIAL**

- 283 Are volcanic eruptions causing the current global warming?**  
G. Bala
- 

**CORRESPONDENCE**

- 285 Waste management: new challenge after the recent earthquake in Nepal,** Daya Gautam and Til Bahadur Chhetri ■ **286 Citation of papers vis-à-vis quality of research in agricultural sciences,** B. S. Dhillon and T. S. Thind ■ **287 Information and communication technology for effective integrated pest management,** S. Vennila ■ **288 CSIR in SIR 2015,** Gangan Prathap
- 

**NEWS**

- 290 Awareness and capacity building in carbon capture and utilization,** Malti Goel
- 

**RESEARCH NEWS**

- 292 From a benchtop microscope to a pocket microscope**  
Bhagya Gupta, Vishal Dubey, Rakesh Kumar, Ramendra Lal Mukherjee and Rajib Bandopadhyay
- 

**OPINION**

- 294 Enhancing the efficacy of the 'DBT and DST Open Access Policy'**  
Praveen Chaddah
- 

**SCIENTIFIC CORRESPONDENCE**

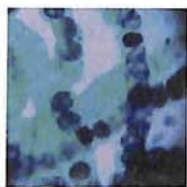
- 296 Modern pollen rain in Kedarnath: implications for past vegetation and climate**  
Ratan Kar, Ruchika Bajpai and Kriti Mishra
- 299 *In situ* occurrence of *Vertebraria* roots in the Raniganj Formation of Singrauli Coalfield and its palaeoecological significance**  
Kamal Jeet Singh, Anju Saxena and Shreerup Goswami
- 302 Application of DInSAR technique for post-earthquake land deformation mapping of Eastern Nepal**  
Shweta Sharma, Y. S. Rao, Ajai and A. K. Mathur
- 304 Secondary craters detection from Mini-SAR for lunar surface age dating**  
Kedovikho Yhoshü, R. S. Chatterjee and P. K. Champati Ray
- 

**GENERAL ARTICLE**

- 307 Research competitiveness of Indian institutes of science education and research**  
Tanu Solanki, Ashraf Uddin and Vivek Kumar Singh
- 

**RESEARCH ACCOUNT**

- 311 Agricultural biotechnology and crop productivity: macro-level evidences on contribution of *Bt* cotton in India**  
Shivendra Kumar Srivastava and Deepthi Kolady
- 



## REVIEW ARTICLES

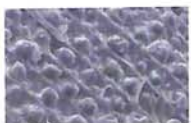
- 320 **Role of soil physical properties in soil health management and crop productivity in rainfed systems–II. Management technologies and crop productivity**  
A. K. Indoria, K. L. Sharma, K. Sammi Reddy and Ch. Srinivasa Rao
- 329 **Conversion of biomass-generated syngas into next-generation liquid transport fuels through microbial intervention: potential and current status**  
Dipti Verma, Ashish Singla, Banwari Lal and Priyangshu M. Sarma

## RESEARCH ARTICLES

- 337 **Is gamma irradiation as a secondary sterilization procedure required for decellularized xenogenic tissue material?**  
S. Guhathakurta, V. Balasubramanian, B. V. R. Tata and S. Ponraju
- 345 **Assessing climate change impacts on forest ecosystems for landscape-scale spatial planning in Nepal**  
Gokarna Jung Thapa, Eric Wikramanayake, Shant Raj Jnawali, Judy Ogleshorpe and Ramesh Adhikari
- 353 **Effect of sandblasting, annealing and hydrophobic treatment on the nano-mechanical and corrosion behaviour of *n*-TiO<sub>2</sub>-coated 316L stainless steel**  
Zaki Ahmad, Faheemuddin Patel, Naila Riaz Mastoi and Ayesha Saddiq
- 363 **Sediment pathways and emergence of Himalayan source material in the Bay of Bengal**  
K. S. Krishna, M. Ismaiel, K. Srinivas, D. Gopala Rao, J. Mishra and D. Saha
- 373 **A comparative study on application of time series analysis for traffic forecasting in India: prospects and limitations**  
Kartikeya Jha, Nishita Sinha, Shrinivas S. Arkatkar and Ashoke K. Sarkar

## RESEARCH COMMUNICATIONS

- 386 **High cadmium contamination at the gateway to Sundarban ecosystem driven by Kolkata metropolitan sewage in India**  
Anirban Akhand, Abhra Chanda, Sourav Das, Pranabes Sanyal and Sugata Hazra
- 392 **Cr(VI) removal from synthetic textile effluent using *Tamarindus indica* bark: a kinetic and thermodynamic study**  
Sudesh and Varsha Goyal
- 399 **Chromium toxicity to tomato (*Lycopersicon esculentum* Mill) susceptible to *Fusarium* wilt pathogen**  
Saba Kurshid, Amna Shoaib and Arshad Javaid
- 405 **Rice (*Oryza sativa* L.) yield gap using the CERES-rice model of climate variability for different agroclimatic zones of India**  
P. K. Singh, K. K. Singh, L. S. Rathore, A. K. Baxla, S. C. Bhan, Akhilesh Gupta, G. B. Gohain, R. Balasubramanian, R. S. Singh and R. K. Mall
- 414 **A study on general allometric relationships developed for biomass estimation in regional scale taking the example of *Tectona grandis* grown in Bundelkhand region of India**  
D. Deb, A. Ghosh, J. P. Singh and R. S. Chaurasia
- 419 **Evidence of wildfires in the Late Permian (Changhsinghian) Zewan Formation of Kashmir, India**  
André Jasper, Dieter Uhl, Deepa Agnihotri, Rajni Tewari, Sundeep K. Pandita, José Rafael Wanderley Benicio, Etienne Fabbrin Pires, Átila Augusto Stock Da Rosa, Gulam D. Bhat and S. Suresh K. Pillai





- 424 Soybean (*Glycine max*) microRNAs display proclivity to repress *Begomovirus* genomes  
Shunmugiah V. Ramesh, Girish K. Gupta and Syed M. Husain
- 429 Rank-frequency analysis of characters in Garhwali text: emergence of Zipf's law  
Manoj Kumar Riyal, Nikhil Kumar Rajput, Vinod Prasad Khanduri and Laxmi Rawat
- 434 Life history fitness of giant ladybird predator (Coleoptera: Coccinellidae) of woolly aphids (Hemiptera: Aphididae) in varying prey densities from northeast India  
Basant K. Agarwala and Joydeb Majumder
- 438 Variations in the abundance and diversity of insects in apple orchards of Kumaun, Western Himalaya, India  
Bhawana Kapkoti, Ravindra K. Joshi and Ranbeer S. Rawal

---

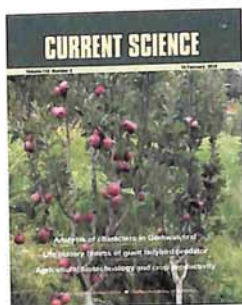
#### BOOK REVIEWS

- 444 NANOPARTICLES for Catalysis, Energy and Drug Delivery, Ramesh S. Chaughule and Anant R. Kapdi (eds), reviewed by G. D. Yadav
- 444 Annual Review of Cell and Developmental Biology, 2014, Randy Schekman, Larry Goldstein and Ruth Lehmann (eds), reviewed by Ramakrishnan Nagaraj
- 445 Annual Review of Public Health 2015, Jonathan E. Fielding, Ross C. Brownson and Lawrence W. Green (eds), reviewed by Mario Vaz
- 447 Landscapes and Landforms of India, Vishwas S. Kale (ed.), reviewed by L. S. Chamyal

---

#### PERSONAL NEWS

- 449 Subramania Ranganathan (1934–2016), D. Balasubramanian
- 



- ◀ COVER. Apple trees. See page 438 for an article on 'Variations in the abundance and diversity of insects in apple orchards of Kumaun, Western Himalaya, India'.

Indexed in CURRENT CONTENTS/GEODATABASE/CHEMICAL ABSTRACTS/IndMED/SCOPUS/  
WEB OF SCIENCE

# CURRENT SCIENCE

Volume 110 Number 4

25 February 2016

474 **In this issue**

**GUEST EDITORIAL**

- 475 **Bridging the gap between intentions and contributions requires determined effort**  
Shoibal Chakravarty and Dilip R. Ahuja

**CORRESPONDENCE**

- 477 **M.C. Mehta Vs Union of India: how is compulsory environmental education doing in India?**, Anwsha Borthakur and Pardeep Singh ■ **477 Make in India**, B. A. Dasannacharya; *Response by* E. Arunan ■ **479 Is the Scyphozoan jellyfish *Lychnorhiza malayensis* symbiotically associated with the crucifix crab *Charybdis feriatus*?**, R. Jeyabaskaran, Gishnu Mohan, K. S. Abhilash, D. Prema and V. Kripa ■ **480 How reliable are the data on the recent coral bleaching event in Malvan Reef, India?**, Manickam Nithyanandan; *Response by* Baban Ingole



**NEWS**

- 482 **Bridging innovations in academic institutions to society**, T. Pradeep ■ **486 Traditional ethnomedicinal knowledge of Indian tribes**, Naveen K. Sharma, Prashant K. Singh, Vijay Pramanik, Biswjit Maji and Virendra K. Mishra ■ **488 Krishi Vigyan Kendras: engines for skill-intensive agriculture**, Rajbir Singh and Ashish Santosh Murai

**IN CONVERSATION**

- 490 **Mahan Mj**, B. Sandhya Rani ■ **492 Amit Sharma**, Rajashree Ramaswamy

**RESEARCH NEWS**

- 495 **Does the recent IUPAC definition on hydrogen bonding lead to new intermolecular interactions?**, Rajendra Parajuli

**OPINION**

- 499 **Redesigning environmental courses for effective environmental protection**, Chong Shimray

**SCIENTIFIC CORRESPONDENCE**

- 502 **Toxic effects of iron on green and brown hydra**, Goran Kovačević, Gordana Gregorović, Ana Matijević and Mirjana Kalafatić ■ **504 *Aquilaria malaccensis* fruit borer in Peninsular Malaysia**, S. P. Ong and K. H. Lau ■ **506 Sea buckthorn leaves – a better substitute for green tea**, Deepak Gupta and Veenu Kaul



**GENERAL ARTICLES**

- 508 **Quantification and monitoring of forest cover changes in Agasthyamalai Biosphere Reserve, Western Ghats, India (1920–2012)**  
Kalloli Dutta, C. Sudhakar Reddy, Subrat Sharma and C. S. Jha
- 521 **Biodiversity hotspot of Bhutan and its sustainability**  
Aparna Banerjee and Rajib Bandopadhyay



**SPECIAL SECTION: ADVANCEMENTS IN BIOTECHNOLOGY**

- 528 **Preface**  
K. VijayRaghavan
- 529 **Biology across scales: historical perspective on some Indian contributions**  
Shekhar C. Mande
- 533 **Human resource development in biotechnology**  
K. Dharmalingam





- 535 **The legacy of G. N. Ramachandran and the development of structural biology in India**  
M. Vijayan
- 543 **DBT propelled national effort in creating mutant resource for functional genomics in rice**  
S. V. Amitha Mithra, M. K. Kar, T. Mohapatra, S. Robin, N. Sarla, M. Seshashayee, K. Singh, A. K. Singh, N. K. Singh and R. P. Sharma
- 549 **New pathogen discovery**  
Balachandran Ravindran
- 552 **Biofuels for India: what, when and how**  
Arvind Lali
- 556 **The largest distributed network of bioinformatics centres in the world: Biotechnology Information System Network (DBT-BTISNET)**  
S. Krishnaswamy and T. Madhan Mohan
- 562 **Role of DBT in promoting biotechnology-based development in North East India**  
Pawan Sharma and T. Madhan Mohan
- 573 **Biotechnology communication needs a rethink**  
Archita Bhatta and Kinkini Dasgupta Misra



---

#### REVIEW ARTICLE

- 579 **Chemopreventive prospective of dietary spices against hepatocellular carcinoma**  
Tasleem Akhtar and Nadeem Sheikh

---

#### RESEARCH ACCOUNT

- 584 **How long does it take for tropical marine fish stocks to recover after declines? Case studies from the Southwest coast of India**  
K. S. Mohamed and S. Veena

---

#### RESEARCH ARTICLES

- 595 **Clinical effectiveness of preoperative neoadjuvant chemotherapy for patients with borderline resectable pancreatic cancer: an updated meta-analysis**  
Yao Liu, Shan-Miao Gou, Yong Tang and Chi-Dan Wan
- 603 **Soft fuzzy model for mining amino acid associations in peptide sequences of *Mycobacterium tuberculosis* complex**  
Amita Jain and Kamal Raj Pardasani
- 619 **Influence of urban spatial morphology on air temperature variance**  
Guixin Zhang, Zhenchun Hao and Shanyou Zhu
- 627 **Comparing the spatio-temporal variability of remotely sensed oceanographic parameters between the Arabian Sea and Bay of Bengal throughout a decade**  
Sourav Das, Abhra Chanda, Suparna Dey, Sanjibani Banerjee, Anirban Mukhopadhyay, Anirban Akhand, Amit Ghosh, Subhajit Ghosh, Sugata Hazra, D. Mitra, Aneesh A. Lotliker, K. H. Rao, S. B. Choudhury and V. K. Dadhwal
- 640 **Normal faults near the top of footwall of Ramgarh Thrust along Kosi River valley, Kumaun Lesser Himalaya**  
S. S. Bhakuni and Khayingshing Luirei
- 649 **Petrogenesis of an early Cretaceous potassic lamprophyre dyke from Rongjeng, East Garo Hills, Shillong plateau, north-eastern India**  
Rajesh K. Srivastava, Leone Melluso and Anup K. Sinha
- 659 **Molecular phylogeny of rediscovered Travancore flying squirrel (*Petinomys fuscocapillus*) and its conservation implications**  
Ashutosh Singh and Archana Bahuguna
- 667 **Identification of the major language families of India and evaluation of their mutual influence**  
Debapriya Sengupta and Goutam Saha



## RESEARCH COMMUNICATIONS

- 682 **Diurnal variations in rainfall over Indian region using self recording raingauge data**  
Kamaljit Ray, A. H. Warsi, S. C. Bhan and A. K. Jaswal
- 687 **Classification of CT liver images using local binary pattern with Legendre moments**  
B. Vijayalakshmi and V. Subbiah Bharathi
- 692 **Development of agro-technology to increase yields of a shy-bearer desi cotton species, *Gossypium arboreum* race *cernuum* in a non-traditional area of cultivation**  
M. V. Venugopalan, K. R. Kranthi, Shubhangi Lakade and N. R. Tandulkar
- 695 **Modelling fluid flow through fractured reservoirs: is it different from conventional classical porous medium?**  
G. Suresh Kumar
- 701 **Delineation of groundwater saturation indicators and their distributions in the complex argillaceous geological units of Ezza north local government area of Ebonyi state, Nigeria**  
Daniel N. Obiora, Johnson C. Ibuot, Nyakno J. George and Solomon U. Offiah
- 708 **Haematological and immunological response of *Achyranthes aspera* leaf and root extracts in arsenic-intoxicated female mice (*Mus musculus*)**  
Veena Sharma and Rashmi Singh
- 713 **Collembolans and mites communities as a tool for assessing soil quality: effect of eucalyptus plantations on soil mesofauna biodiversity**  
Gleidson Gimenes Rieff, Tiago Natal-da-Luz, José Paulo Sousa, Marcelo Osório Wallau, Leandro Hahn and Enilson Luiz Saccol de Sá

---

## BOOK REVIEWS

- 720 **An Introduction to Astronomy and Astrophysics** by Pankaj Jain, *reviewed by* B. S. Shylaja  
■ **721 Annual Review of Nutrition, 2014**, Robert J. Cousins, Dennis M. Bier and Barbara A. Bowman (eds), *reviewed by* Indu Mani and Anura V. Kurpad ■ **722 Plant Biochemistry: Techniques and Procedures** by G. Nagaraj, *reviewed by* R. Srinivasan ■ **723 Mammals of South Asia, Volume II**. A. J. T. Johnsingh and Nima Manjrekar (eds), *reviewed by* H. S. Sushma and Mewa Singh

- 
- 725 **Publications received – 2015**
- 



- ◀ **COVER.** DNA replication and *typhimurium* methyl citrate synthase decamer structure. See special section.

Indexed in CURRENT CONTENTS/GEOTitles/CHEMICAL ABSTRACTS/IndMED/SCOPUS/  
WEB OF SCIENCE

# CURRENT SCIENCE

Volume 110 Number 5

10 March 2016

746 **In this issue**

**GUEST EDITORIAL**

747 **IISERs: emerging science universities of India**  
N. Sathyamurthy

**CORRESPONDENCE**

749 **Recognition of traditional medicine in the Nobel for artemisinin is inescapable, Abhay Sharma ■ 749 Indian Science Congress – a circus or a forum for showcasing hard science?, Om P. Sharma ■ 750 Teaching-based research is a requirement in institutions of higher learning to impart quality education, Suvendra Kumar Ray**

**NEWS**

752 **Current Science Editorial Meeting – Scientific sessions, Rajashree Ramaswamy and Swetha Gopal ■ 756 India International Science Festival 2015, Veeru Kant Singh, Anju Saxena, Poonam Verma, Parminder Singh Ranhotra, Deepa Agnihotri, Jyoti Srivastava, M. C. Manoj and Md. Firoze Quamar ■ 758 Litchi fruit borers, P. V. Rami Reddy, Kuldeep Srivastava and Vishalnath ■ 759 Palaeoanthropology, Parth R. Chauhan and Prabhin Sukumaran**

**IN CONVERSATION**

761 **Jonardon Ganeri, Swetha Gopal**

**OPINION**

763 **IISERs: new initiative towards excellence in science, Avinash Khare**

**COMMENTARY**

766 **Publication phishing: a growing challenge for researchers and scientific societies**  
Shahryar Sorooshian

**SCIENTIFIC CORRESPONDENCE**

768 **Signal enhancement in fluorescence microscopy by microsecond pulsed excitation**  
Arijit K. De and Debabrata Goswami

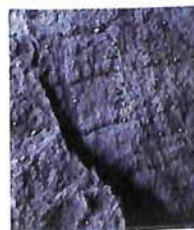
770 ***Schismatomma galactinum* (lichenized ascomycota), a lichen species new to India**  
Reema Goni and Namrata Sharma

771 **Soil organic carbon pool under different land uses in Achanakmar Amarkantak Biosphere Reserve of Chhattisgarh, India**  
Sheikh Iqbal and S. C. Tiwari

774 **Soft-bodied fossil preservation in the Cambrian Parahio Formation of Spiti**  
Nigel C. Hughes

**GENERAL ARTICLE**

776 **Machines (non-human) and thinking: can they coexist?**  
Pinaki Roy Chowdhury





## REVIEW ARTICLE

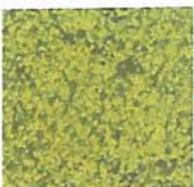
- 782 **Nuclear forensics: what, why and how?**  
Suresh Kumar Aggarwal

## RESEARCH ARTICLES

- 792 **Effective estimation of GAGAN signals with adaptive equalization**  
M. A. Khadar Baba and V. Malleswara Rao
- 800 **Evaluation of the effect of size reduction and thermal treatment on metal extraction from PCBs of mother board and digital video drive of desktop PC**  
Sushant B. Wath, Mayuri N. Katariya, Amit K. Bansiwala, Vilas M. Shinde and Atul N. Vaidya
- 808 **Traffic data analysis using image processing technique on Delhi–Gurgaon expressway**  
Nipjyoti Bharadwaj, Pallav Kumar, Shriniwas Arkatkar, Akhilesh Maurya and Gaurang Joshi
- 823 **Virological perspectives and characterization of seasonal influenza B viruses in Mumbai**  
Devanshi Gohil, Sweta Kothari, Daphne Correa, Ranjana Deshmukh and Abhay Chowdhary
- 828 **Classification and domain analysis of protein kinases in hominids**  
Saranya Jayapalan and Jeyakumar Natarajan
- 839 **Fission–fusion species under restricted living conditions: a comparative study of dyadic interactions and physical proximity in captive bonobos and Bornean orangutans**  
Dorothee Classen, Stefanie Kiessling, Madhur Mangalam, Werner Kaumanns and Mewa Singh
- 851 **Effect of elevated temperature on life-history parameters of rice yellow stem borer (*Scirpophaga incertulas* Walker)**  
Narayanansamy Manikandan, J. S. Kennedy and V. Getthalakshmi
- 857 **ERRATA: Understanding transitions in a rural Indian building typology in the context of well-being**  
Kumari Moothedath Chandran, Nallaval Chinnaswamy Balaji and Monto Mani [*Curr. Sci.*, 2015 109(9), 1610–1621]

## RESEARCH COMMUNICATIONS

- 858 **Air-pollution and economics: diesel bus versus electric bus**  
S. R. Adheesh, M. Shravanth Vasisht and Sheela K. Ramasesha
- 863 **Analysis of the constituents of urinary calculi of dog using various scientific techniques**  
Pragnya A. Bhatt, Riddhi P. Laiya, Deepak B. Patil, Pinesh V. Parikh and Parimal Paul
- 867 **Economic analysis of different greenhouse gas mitigation technologies in rice–wheat cropping system of the Indo-Gangetic Plains**  
Dipak Kumar Gupta, Arti Bhatia, T. K. Das, Parmendra Singh, Amit Kumar, Niveta Jain and Himanshu Pathak
- 874 **Clay dispersion induced by changes in some soil properties in undulating salt-affected landscapes of southern Karnataka, India**  
K. Rajan, A. Natarajan, V. Kasthuri Thilagam, K. S. Anil Kumar, D. Dinesh, N. M. Alam, O. P. S. Khola and R. C. Gowda
- 884 ***Cannabis sativa* (Cannabaceae) in ancient clay plaster of Ellora Caves, India**  
M. Singh and M. M. Sardesai



- 891 **Induction of sperm-head abnormality in Swiss albino mice *Mus musculus* by administration of fresh and processed betel nut extracts**  
Pritikana Saha and Sekhars Bhattacharya
- 897 **Circadian rhythm determines the timing of activity, and ingestive and grooming behaviours in Indian house crows, *Corvus splendens***  
S. K. Tahajjul Taufique, Neelu Anand Jha and Vinod Kumar
- 902 **Electrophysiological and behavioural responses of sweetpotato weevil, *Cylas formicarius* to green leaf volatiles and terpenoids**  
Tanmayee Samantaray and Rajasekhara Rao Korada
- 908 **Distribution and conservation status of the caenophidian snake, *Xylophis captaini* Gower & Winkler, 2007 in the Western Ghats, India**  
Subramanian Bhupathy, V. J. Jins, Santhanakrishnan Babu and Joyce Jose



### BOOK REVIEWS

- 913 **In Search of Biohappiness: Biodiversity and Food, Health and Livelihood Security** by M. S. Swaminathan, *reviewed by* Rai S. Rana ■ **914 Public Transport Planning and Management in Developing Countries** by Ashish Verma and T. V. Ramanayya, *reviewed by* Kshitija Joshi ■ **916 Annual Review of Neuroscience, 2014**, Steven E. Hyman, Thomas M. Jessell, Carla J. Shatz, Charles F. Stevens and Huda Y. Zoghbi (eds), *reviewed by* S. K. Sikdar ■ **918 The Water Book: The Extraordinary Story of Our Most Ordinary Substance**, Alok Jha; **The Last Drop: The Politics of Water**, Mike Gonzalez and Marianella Yanes, *reviewed by* Sudhirendar Sharma ■ **919 Annual Review of Earth and Planetary Sciences, 2015**, Raymond Jeanloz and Katherine H. Freeman (eds), *reviewed by* C. P. Rajendran

### PERSONAL NEWS

- 922 **Chirayathumadom Venkatachaliar Subramanian (1924–2016)**  
H. Y. Mohan Ram

### HISTORICAL NOTES

- 923 **On the villainous saltpetre in pre-independent India**  
Ramya Raman, S. Sudha Revathy and Anantanarayanan Raman



- ◀ **COVER.** Bonobos at Cologne Zoo, Germany. (Photo Credit: Rolf Schlosser). See page 839.

Indexed in CURRENT CONTENTS/GEOTitles/CHEMICAL ABSTRACTS/IndMED/SCOPUS/  
WEB OF SCIENCE

# CURRENT SCIENCE

Volume 110 Number 6

25 March 2016

954 In this issue

**GUEST EDITORIAL**

955 **Ethics and Indian science**  
Sunil Mukhi

**CORRESPONDENCE**

957 **Where do the hybrids go?**, Usha Padmanabhan ■ 957 **How well are we managing laboratory waste in India?**, Anwasha Borthakur and Pardeep Singh ■ 958 **Drones: new tools for natural risk mitigation and disaster response**, D'Alessandro Antonino ■ 959 **Rajaji Tiger Reserve: conservation opportunities and challenges**, Ritesh Joshi

**NEWS**

961 **Iran launches the Mustafa Prize for Sciences**, Sameen Ahmed Khan ■ 962 **Science Last Fortnight**, Gita Madhu and K. P. Madhu ■ 964 **Climate change in the Indian perspective and its societal impacts**, Dhruv Sen Singh and Rajesh Agnihotri ■ 965 **Electronic theses and dissertations**, Anup Kumar Das

**RESEARCH NEWS**

967 **Onions can bend, contract and elongate just like muscles**  
Ujjal Kumar Sur

**OPINION**

969 **Integrated farming system: is it a panacea for the resource-poor farm families of rainfed ecosystem?**  
Sujit K. Nath, H. K. De and B. K. Mohapatra

**COMMENTARY**

972 **Is research mandatory for teaching undergraduate chemistry?**  
Lakshmy Ravishankar, Savita Ladage and Gomathi Shridhar

**SCIENTIFIC CORRESPONDENCE**

974 **Atmospheric N and P deposition in the Ganges Basin**  
J. Pandey, U. Pandey, A. V. Singh, S. Tripathi and V. Mishra

976 **Artificial pollination and fruit set in double coconut growing in India**  
Saheed Shahul Hameed

979 **Upwelling-initiated algal bloom event in the coastal waters of Bay of Bengal during post-northeast monsoon period (2015)**  
Gouri Sahu, A. K. Mohanty, R. K. Sarangi, S. N. Bramha and K. K. Satpathy

982 **Red-tide of *Mesodinium rubrum* (Lohmann, 1908) in Indian waters**  
Biraja Kumar Sahu, R. C. Panigrahy, S. K. Baliarsingh, C. Parida, K. C. Sahu and Aneesh A. Lotliker

983 **Karyotype of the Indian giant squirrel (*Ratufa indica*)**  
R. Venkataramanan, N. Murali, C. Sreekumar and K. V. Gowrimanokari





- 985 **Breeding tubercles in scales of male *Barilius bendelisis* (Hamilton, 1807) identified as sexual dimorphic character**  
Jafrin Farha Hussain and Sabitry Bordoloi



- GENERAL ARTICLES**
- 987 **Geological marvels, hallowed shrines and unification of people of India**  
K. S. Valdiya
- 996 **On the symmetry of the central dome of the Taj Mahal**  
Dilip R. Ahuja and M. B. Rajani

- REVIEW ARTICLE**
- 1000 **DNA-based methods for detection of genetically modified events in food and supply chain**  
Gurinderjit Randhawa, Monika Singh and Payal Sood

- RESEARCH ARTICLES**
- 1010 **El Niño and the Indian rainfall in June**  
Sulochana Gadgil and P. A. Francis
- 1023 **Biocompatibility studies of electron beam cured pressure sensitive adhesive tape for medical application**  
Anil Kumar Singh and Gurdeep Singh
- 1031 **Comparison of data mining approaches for estimating soil nutrient contents using diffuse reflectance spectroscopy**  
M. C. Sarathjith, B. S. Das, S. P. Wani, K. L. Sahrawat and A. Gupta
- 1038 **Prediction of sediment erosion pattern in Upper Tapi Basin, India**  
Prabhat Chandra, P. L. Patel and P. D. Porey
- 1050 **Methodology for the estimation of groundwater flux across simplified boundary using GIS and groundwater levels**  
Kuldeep Kushwaha and Rohit Goyal

- RESEARCH COMMUNICATIONS**
- 1059 **Extraction and analysis of ketamine (a rave drug) from spiked fruit juices using MEPS-MS for forensic purposes**  
Sandeep Singh Sahota, Jaswinder Singh, Gulsan Bansal and Rakesh Kumar Garg
- 1063 **Assessment of driver vision functions in relation to their crash involvement in India**  
Ashish Verma, Neelima Chakrabarty, S. Velmurugan, B. Prithvi Bhat, H. D. Dinesh Kumar and B. Nishanthi
- 1072 **Study of traffic noise in urban street canyons of Bengaluru city**  
Halesh Koti, G. Ranganath and H. N. Rajakumara
- 1079 **Water environment remote sensing atmospheric correction of Geostationary Ocean Color Imager data over turbid coastal waters in the Bohai Sea using artificial neural networks**  
Liqiao Tian, Qun Zeng, Xiaojuan Tian, Jian Li, Zheng Wang and Wenbo Li
- 1086 **Towards morphological variability of symbiotic algae**  
Mirjana Kalafatić, Nives Rajević and Goran Kovačević
- 1088 **Changes in the seasonal cycle of carbon stocks and fluxes due to fires in the grassland ecosystem of Manipur, Northeast India**  
A. Thokchom and P. S. Yadava





- ◀ 1094 **Development of ductile shear zones during diapiric magmatism of nepheline syenite and exhumation of granulites – examples from central Rajasthan, India**  
A. B. Roy, Krishan Dutt and Sanjeeb Rathore

- 1102 **Breeding and nesting behaviour of *Rhacophorus maximus* (Anura: Rhacophoridae) in Meghalaya, North East India**  
S. Khongwir, R. N. K. Hooroo and S. K. Dutta



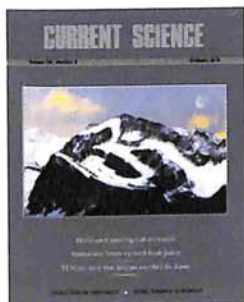
- ◀ 1105 **A new ant species of the genus *Anochetus* (Hymenoptera: Formicidae) from India with a remarkable nest entrance architecture**  
Aniruddha Marathe and Dharma Rajan Priyadarsanan

### BOOK REVIEWS

- 1108 **Air Pollution and Health Effects**, Srikanth S. Nadadur and John W. Hollingsworth (eds), reviewed by Tirthankar Banerjee and Nandita Singh ■ 1109 **Dielectric Relaxation in Biological Systems: Physical Principles, Methods and Applications**, Valerica Raicu and Yuri Feldman (eds), reviewed by Shilpee Jain ■ 1110 **Some Pioneers of Mathematics: Biographical Accounts for the General Audience** by Subodh Mahanti, reviewed by Sucharita Ranganathan ■ 1110 **Nature and Nation: Essays on Environmental History** by Mahesh Rangarajan, reviewed by T. R. Shankar Raman

### PERSONAL NEWS

- 1112 **Deepak Kumar (1946–2016)**  
Shankar Prasad Das



- ◀ COVER. 'A geological marvel crafted by nature in snow and ice on the 220 to 160 million years old folded sedimentary rocks in the Himalaya in NE Uttarakhand. See page 987.

Indexed in CURRENT CONTENTS/GEOBASE/CHEMICAL ABSTRACTS/IndMED/SCOPUS/  
WEB OF SCIENCE



# CURRENT SCIENCE

Volume 110 Number 7

10 April 2016

**1130 In this issue**

**GUEST EDITORIAL**

- 1131 Seeing the universe in a new light**  
Rajesh Gopakumar and Spenta R. Wadia

**CORRESPONDENCE**

- 1134 Improving physics education in the country needs joint efforts**, Ashutosh Kumar Shukla ■ **1134 Are national level conferences 'end of season sales'?**, S. Chandrasekaran ■ **1135 India's contribution in the journal Nature**, Nitin Kumar, Yatish Panwar, Monika Verma and G. Mahesh ■ **1137 IISERs**, Richard N. Zare; *Response by N. Sathyamurthy*

**NEWS**

- 1138 Science Last Fortnight**, Gita Madhu and K. P. Madhu ■ **1140 2016 King Faisal International Prize for Science and Medicine**, Sameen Ahmed Khan ■ **1142 Grasslands and pastoralism**, Ankila J. Hiremath, Ramya Ravi and Abi Tamim Vanak ■ **1144 Singhbhum craton**, Ajay Manglik and Prantik Mandal

**RESEARCH NEWS**

- 1146 Double bonanza at the LIGO gravitational wave detectors**  
C. S. Unnikrishnan

**COMMENTARY**

- 1153 Marine debris – the global problem least studied in India**  
A. Arun Kumar and R. Sivakumar

**OPINION**

- 1155 'Fish festivals' in the Garhwal Himalaya: conservation options amidst age-old practices**  
Kartikeya Sharma, Nishikant Gupta, J. A. Johnson and K. Sivakumar

**SCIENTIFIC CORRESPONDENCE**

- 1157 Rare earth element potential of the felsite dykes of Phulan area, Siwana Ring Complex, Rajasthan, India**  
Utpol Kumar Das, Arindam Gantait, Lopamudra Panda and Shabbir Hussain
- 1162 Mineral compositional studies of slag from Galla village, Uttarakhand, India**  
Arindam Das, Amitava Kundu and P. V. S. Rawat
- 1165 Spatial distribution of suspended particulate matter in the Mandovi and Zuari estuaries: inferences on the estuarine turbidity maximum**  
S. Suja, Pratima M. Kessarkar, R. Shynu, V. Purnachandra Rao and Lina L. Fernandes

**GENERAL ARTICLES**

- 1169 Temporal adaptation of agricultural extension systems in India**  
A. K. Singh, S. K. Dubey, Uma Sah and Lakhan Singh
- 1178 Mapping of breast cancer research in India: a bibliometric analysis**  
Nirmal Singh, Tarvinder Singh Handa, Dhiraj Kumar and Gurpreet Singh



- 1184 **Scientometrics of rare earths research in India**  
R. S. Vishnumaya, P. Nishy and S. Mini

---

**SPECIAL SECTION: CLIMATE CHANGE IMPACTS AND ADAPTATION**

- 1193 **Preface**  
Pinki Mondal, Harini Nagendra and Ruth DeFries
- 1195 **Evaluating the resilience of forest dependent communities in Central India by combining the sustainable livelihoods framework and the cross scale resilience analysis**  
Alark Saxena, Burak Guneralp, Robert Bailis, Gary Yohe and Chadwick Oliver
- 1208 **Carbon neutral village/cluster: a conceptual framework for envisioning**  
Mihir Mathur and Suchita Awasthi
- 1216 **Adaptation of farming community to climatic risk: does adaptation cost for sustaining agricultural profitability?**  
S. Naresh Kumar, Anuja, Md. Rashid, S. K. Bandyopadhyay, Rabindra Padaria and Manoj Khanna
- 1225 **Multi-scale vulnerability assessment for adaptation planning**  
Tashina Esteves, Darshini Ravindranath, Satyasiba Beddamatta, K. V. Raju, Jagmohan Sharma, G. Bala and Indu K. Murthy
- 1240 **Effects of climate change on household economy and adaptive responses among agricultural households in eastern coast of India**  
K. Narayanan and Santosh K. Sahu
- 1251 **Economic benefits of climate-smart agricultural practices to smallholder farmers in the Indo-Gangetic Plains of India**  
Arun Khatri-Chhetri, Jeetendra P. Aryal, Tek B. Sapkota and Ritika Khurana
- 1257 **The impacts of climate change on Tamil Nadu rainfed maize production: a multi-model approach to identify sensitivities and uncertainties**  
Sonali McDermid, R. Gowtham, K. Bhuvaneshwari, Geethalakshmi Vellingiri and Lakshmanan Arunachalam
- 1272 **Climatic and non-climatic factors influencing changing agricultural practices across different rainfall regimes in South Asia**  
Gopal Datt Bhatta, Pramod Kumar Aggarwal, Patti Kristjanson and Amit Kumar Shrivastava

---

**REVIEW ARTICLES**

- 1282 **Breastfeeding, a child survival strategy against infant mortality in Nigeria**  
Itse Jacdonmi, M. S. Suhainizam and G. R. Jacdonmi
- 1288 **Application of stable isotopes in ecosystem research**  
Mukesh Kumar Gautam and Kwang-Sik Lee

---

**RESEARCH ARTICLES**

- 1307 **Mapping of computational biology research inventions through quantitative patent analysis**  
Ankit Tripathi, Tarakanta Jana, Nupur Wadia, Deepak Bindal and Swarnil Dey
- 1315 **A new approach for tracking moving objects in underwater environment**  
M. N. V. S. S. Kumar, Nagamani Modalavalasa, L. Ganesh, K. Satya Prasad and G. Sasibhushana Rao

---

**RESEARCH COMMUNICATIONS**

- 1324 **Characterization of carbohydrates and proteins in *Phalaris minor* seeds by Cornell net carbohydrate and protein system**  
Jasmine Kaur and S. S. Thakur



- 1330 **Importance of agriculture and crop residues in carbon sequestration and nutrient enrichment at agricultural farms of East Kolkata Wetland area, a Ramsar site**  
Sudin Pal, Buddhadeb Chattopadhyay and Subhra Kumar Mukhopadhyay
- 1337 **Incidence of alien Asteraceae in Telangana and residual Andhra Pradesh and possible ecological implications**  
Sateesh Suthari, Ramesh Kandagatla, Ajmeera Ragan and Vatsavaya S. Raju
- 1343 **Food resource exploitation in ladybirds: consequences of prey species and size**  
Desh Deepak Chaudhary, Bhupendra Kumar, Geetanjali Mishra and Omkar
- 1350 **High nitrate content in the surface water of Balipara, North Brahmaputra river basin, Sonitpur district, Assam, India: a multivariate approach**  
Richa Chaturvedi, Saumen Banerjee, Bodhaditya Das, Pronobesh Chattopadhyay, Chira R. Bhattacharjee and Vijay Veer

---

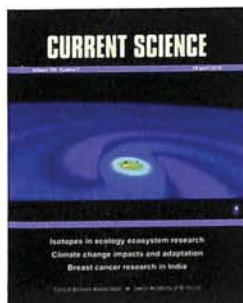
#### BOOK REVIEWS

- 1361 **Lives and Times of Great Pioneers in Chemistry** by C. N. R. Rao and Indumati Rao, *reviewed by* Jai Pal Mittal ■ 1363 **Atmospheric and Aerosol Chemistry**, V. Faye McNeill and Parisa A. Ariya (eds), *reviewed by* Tirthankar Banerjee and Vishnu Murari ■ 1364 **Annual Review of Nutrition, 2015**, Barbara A. Bowman and Patrick J. Stover (eds), *reviewed by* Indu Mani ■ 1366 **Introduction to Pattern Recognition and Machine Learning** by M. Narasimha Murty and V. Susheela Devi, *reviewed by* P. S. Sastry

---

#### PERSONAL NEWS

- 1368 **Kanwar Lal Sahrawat (1941–2016)**  
Tapas Bhattacharyya
- 



- ◀ **COVER:** Supercomputer simulation of the merger of two black holes. The expected gravitational-wave signal from this process is shown below. See pages 1131 and 1146. Photo credit: SXS Collaboration/black-holes.org.

The editor thanks Dr Pinki Mondal, Dr Harini Nagendra and Dr Ruth DeFries for agreeing to be guest editors for the special section.

Indexed in CURRENT CONTENTS/GEODATABASE/CHEMICAL ABSTRACTS/IndMED/SCOPUS/  
WEB OF SCIENCE



# CURRENT SCIENCE

Volume 110 Number 10

25 May 2016

1878 In this issue

## GUEST EDITORIAL

- 1879 **Rediscovering our universities**  
T. V. Ramakrishnan

## CORRESPONDENCE

- 1881 **Is India lax in its e-journals preservation efforts?**, G. Mahesh ■ 1882 **Rich biodiversity of River Kulsi**, Shah Nawaz Jelil ■ 1883 **A rare incidence of unusual flowering in *Crateva adansonii* DC. (Capparaceae)**, A. N. Chandore and N. B. Yemul

## NEWS

- 1884 **Science Last Fortnight**, Sarah Iqbal, Manish Kumar Tekam and K. P. Madhu ■ 1886 **Micropalaeontology and stratigraphy**, Md. Firoze Quamar, Arindam Chakarborty and Syed Azharuddin ■ 1887 **Climate change education**, P. Ghosh, Manju Sundriyal, Durgesh Pant and N. S. Bhandari

## OPINION

- 1888 **Can industrial utilization of invasive aromatic weeds be a sustainable approach for their management?**  
Ram S. Verma, Rajendra C. Padalia, Amit Chauhan, Prakash Goswami and Ved R. Singh

## COMMENTARY

- 1890 **Essential oils: a traditionally realized natural resource for food preservation**  
Bhanu Prakash and S. Kiran

## SCIENTIFIC CORRESPONDENCE

- 1893 **Severe heat wave during May 2015 in Andhra Pradesh**  
B. Hema Malini, K. Lalitha, M. Ganga Raju and Kakani Nageswara Rao
- 1894 **Meteorite fall at Komargaon, Assam, India**  
T. K. Goswami, D. Ray, R. K. Sarmah, U. Goswami, P. Bhattacharyya, D. Majumdar, D. Bezbaruah and P. Borgohain
- 1896 **Geochemical data on the 2005 lava flow of Barren Island volcano, Andaman Sea**  
Alba Patrizia Santo
- 1900 **Growth and physiological responses to an elevation gradient by co-occurring tree species in a shola forest of Kerala, India**  
U. M. Chandrashekhara
- 1901 **Observations on morphometry, egg size and juveniles of the endemic caenophidian snake *Xylophis perroteti* (Dumeril, Bibron and Dumeril, 1854) in the Nilgiris, Western Ghats, India**  
P. Santhoshkumar and P. Kannan



## GENERAL ARTICLES

- 1904 **Measuring the university–industry–government collaboration in Indian research output**  
Rupika, Ashraf Uddin and Vivek Kumar Singh
- 1910 **Improved recovery in H<sub>2</sub>S–H<sub>2</sub>O exchange process for increasing heavy water production**  
A. K. Agarwal
- 1916 **Predictive modelling for archaeological sites: Ashokan edicts from the Indian subcontinent**  
Thomas W. Gillespie, Monica L. Smith, Scott Barron, Kanika Kalra and Corey Rovzar

## REVIEW ARTICLE

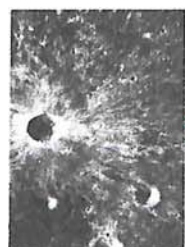
- 1922 **Lipid links inflammation, immunity and insulin resistance to cause epidemic diabetes**  
Samir Bhattacharya and Sandip Mukherjee

## RESEARCH ARTICLES

- 1929 **Impact ejecta characterization for small-sized fresh and degraded lunar craters using radar data**  
Ami J. Desai, Shiv Mohan and Sripada V. S. Murty
- 1939 **A district level assessment of vulnerability of Indian agriculture to climate change**  
C. A. Rama Rao, B. M. K. Raju, A. V. M. Subba Rao, K. V. Rao, V. U. M. Rao, Kausalya Ramachandran, B. Venkateswarlu, A. K. Sikka, M. Srinivasa Rao, M. Maheswari and Ch. Srinivasa Rao
- 1947 **Seismic vulnerability of monastery temples of stone masonry in Sikkim Himalaya**  
Durgesh C. Rai, Vaibhav Singhal, Tripti Pradhan and Anu Tripathi
- 1958 **Analysis of environmental regulation and total factor energy efficiency**  
Chuan Zhang, Weida He and Rong Hao
- 1969 **Leaf litter translocation and consumption in mangrove ecosystems: the key role played by the sesarmid crab *Neosarmatium malabaricum***  
K. Shanij, V. P. Praveen, S. Suresh, Mathew M. Oommen and T. S. Nayar
- 1977 **Population structuring of land and coastal ducks (*Anas platyrhynchos*) using microsatellite markers**  
Uma Gaur, Madhu Sudan Tantia, Bina Mishra, S. T. Bharani Kumar, Ramesh Kumar Vijn and Ashok Chaudhury

## RESEARCH COMMUNICATIONS

- 1984 **Levitation of charged dust grains and its implications in lunar environment**  
J. P. Pabari and D. Banerjee
- 1989 **Photonic crystal-based force sensor to measure sub-micro newton forces over a wide range**  
T. Sreenivasulu, Venkateswara Rao Kolli, T. R. Yadunath, T. Badrinarayana, Amaresh Sahu, Gopalkrishna Hegde, S. Mohan and T. Srinivas
- 1994 **Study of relationship between daily maxima in ozone and temperature in an urban site in India**  
S. S. Gunthe, G. Beig and L. K. Sahu
- 1999 **Diversity of cyanobacteria in biological crusts on arid soils in the Eastern region of India and their molecular phylogeny**  
Dhanesh Kumar, Petr Kaštánek and Siba P. Adhikary





- 2005 **Assessment of carbon storage potential and area under agroforestry systems in Gujarat Plains by CO2FIX model and remote sensing techniques**  
R. H. Rizvi, Ram Newaj, Rajendra Prasad, A. K. Handa, Badre Alam, S. B. Chavhan, Abhishek Saxena, P. S. Karmakar, Amit Jain and Mayank Chaturvedi
- 2011 **Green synthesis of copper bionanoparticles to control the bacterial leaf blight disease of rice**  
Antony Kala, Sebastin Soosairaj, Subramanian Mathiyazhagan and Prakasam Raja
- 2015 **Managing rubber plantations for advancing climate change mitigation strategy**  
Biplab Brahma, Arun Jyoti Nath and Ashesh Kumar Das
- 2019 **CORRECTION – Preface: Special section on ‘Soil and water management’**  
[*Curr. Sci.*, 2016, **110**, 1651]

---

#### BOOK REVIEWS

- 2020 **Annual Review of Physical Chemistry, 2015**, Mark A. Johnson, Todd J. Martinez and Jay T. Groves (eds), *reviewed by* Srihari Keshavamurthy ■ **2023 Noncommutative Mathematics for Quantum Systems**, Uwe Franz and Adam Skalski, *reviewed by* B. V. Rajarama Bhat

---

#### PERSONAL NEWS

- 2025 **Walter Kohn (1923–2016)**, T. V. Ramakrishnan
- 2026 **M. V. Bhatt (1924–2016)**, M. S. Shashidhar and M. Periasamy
- 



- ◀ COVER. The sesamid crab *Neosarmatium malabaricum* holding a senescent leaf of *Avicennia officinalis* to translocate into its burrow for consumption. (Photo: K. Shanij). See page 1969.

Indexed in CURRENT CONTENTS/ GEOBASE/CHEMICAL ABSTRACTS/IndMED/SCOPUS/  
WEB OF SCIENCE

# CURRENT SCIENCE

Volume 110 Number 11

10 June 2016



**2042 In this issue**

**GUEST EDITORIAL**

- 2043 Ayurvedic biology**  
M. S. Valiathan

**CORRESPONDENCE**

- 2045 Carbon-negative biochar from weed biomass for agricultural research in India,** Shaon Kumar Das, R. K. Avasthe and Matber Singh ■ **2046 Need for phytolith-occluded carbon research in India,** Arun Jyoti Nath ■ **2047 Time to publish: the scientific efficiency of nations,** Gangan Prathap

**NEWS**

- 2048 Utilization of vertical spaces for horticultural crop production in urban and peri-urban areas**  
C. Aswath, G. Selvakumar, Christine Zimmerman and Mohan Bajjkar

**OPINION**

- 2050 Classical mechanics, complexity and the methodology**  
Kuiying Deng

**COMMENTARY**

- 2054 All that is green does not conserve: green certification of aquarium fishes in India**  
Priyanka Iyer, Rajeev Raghavan, Neelesh Dahanukar, Nikhil Sood and Sanjay Molur

**SCIENTIFIC CORRESPONDENCE**

- 2057 Monitoring of forest fires from space – ISRO’s initiative for near real-time monitoring of the recent forest fires in Uttarakhand, India**  
Chandra Shekhar Jha, Rajashekar Gopalakrishnan, Kiran Chand Thumaty, Jayant Singhal, C. Sudhakar Reddy, Jyoti Singh, S. Vazeed Pasha, Suresh Middinti, Mutyala Praveen, Arul Raj Murugavel, S. Yugandhar Reddy, Mani Kumar Vedantam, Anil Yadav, G. Srinivasa Rao, Gururao Diwakar Parsi and Vinay Kumar Dadhwal



- 2060 Inheritance of andromonoecy in ridge gourd (*Luffa acutangula Roxb.*) L.**  
B. Varalakshmi and Y. Suchitha

- 2062 Feasibility of quinoa cultivation in Ladakh**  
Anup Raj and Sanjai K. Dwivedi



- 2064 New orchids record in the flora of China**  
Qiang Liu and Jiang-Yun Gao



**GENERAL ARTICLES**

- 2067 Some contributions to neutron scattering in India and Asia-Oceania Region: 1958–2012**  
B. A. Dasannacharya
- 2079 Impact of parental socio-economic factors on the performance of students in IIT-JEE**  
Naresh Kumar



- 2082 **Role of financial agencies in integrating small farmers into a sustainable value chain: a synthesis-based on successful value chain financing efforts**  
Shridhar Patil, Aditya and Ajay K. Jha

- 2091 **Heritage as life-values: a study of the cultural heritage concept**  
Johan Josefsson and Inga-Lill Aronsson



#### REVIEW ARTICLE

- 2099 **Occurrence of ornamental fishes: a looming danger for Inland fish diversity of India**  
S. Sandilyan

#### RESEARCH ARTICLES

- 2105 **Impact of the upper tropospheric cooling trend over Central Asia on the Indian summer monsoon rainfall and the Bay of Bengal cyclone tracks**

P. V. Joseph, G. Bindu and B. Preethi

- 2114 **Characterizing fruit and vegetable peels as bioadsorbents**

Pranav D. Pathak, Sachin A. Mandavgane and Bhaskar D. Kulkarni

- 2124 **An alternative approach of toxic heavy metal removal by *Arthrobacter phenanthrenivorans*: assessment of surfactant production and oxidative stress**

Goutam Banerjee, Arun Kumar Ray, Shubhant Pandey and Ravi Kumar

- 2129 **One-step production of biodiesel from waste cooking oil catalysed by SO<sub>3</sub>H-functionalized quaternary ammonium ionic liquid**

Jing-Juan Qi, Jin-Qing Lin and Hong-Quan Fu

#### RESEARCH COMMUNICATIONS

- 2135 **Development of a cerium-doped lanthanum bromide gamma-ray spectrometer for planetary missions and feasibility studies for determination of elemental abundances of radioactive elements (Th, K and U)**

D. K. Panda, D. Banerjee, S. K. Goyal, A. R. Patel and A. D. Shukla

- 2138 **The effect of meteorological events on sea surface height variations along the northwestern Persian Gulf**

Mohammad Reza Khalilabadi

- 2142 **Flow properties of sandstone and carbonate rocks by X-ray computed tomography**

T. R. Zakirov, A. A. Galeev, E. A. Korolev and E. O. Statsenko

- 2148 **Variations in soil alter availability of carlinoside: an anti-hepatitic compound from *Cajanus cajan* (Linn.) leaves**

Subhasish Das, Sandip Mukherjee, Rakesh Kundu, Pradip Bhattacharyya, Buddhadeb Duary and Satya Sundar Bhattacharya

- 2155 **The new invasive pest *Tuta absoluta* (Meyrick) (Lepidoptera: Gelechiidae) in India and its natural enemies along with evaluation of Trichogrammatids for its biological control**

Chandish R. Ballal, Ankita Gupta, M. Mohan, Y. Lalitha and Abraham Verghese

- 2160 **Teak (*Tectona grandis* L.f.): a preferred timber for shipbuilding in India as evidenced from shipwrecks**

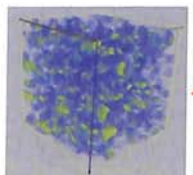
Sila Tripathi, S. R. Shukla, S. Shashikala and Areef Sardar

- 2166 **Discrimination of basmati and non-basmati rice types using polarimetric target decomposition of temporal SAR data**

Vineet Kumar, Mamta Kumari and S. K. Saha

- 2170 **The gut-associated *Klebsiella* sp. of the apple snail produces multiple polysaccharide degrading enzymes**

Md. Imran, Bhukya Saida, Sanjeev C. Ghadi, Pankaj Verma and Yogesh S. Shouche



- 2172 **Application of computational methods in fish species identification based on mitochondrial DNA sequences**  
R. K. Negi, Bheem Dutt Joshi, J. A. Johnson and S. P. Goyal
- 2177 **Habitat preference of Indian peafowl (*Pavo cristatus*) in selected areas of Palakkad district, Kerala, India**  
V. Ranjith and Bobby Jose
- 

#### BOOK REVIEWS

- 2183 **The Most Wanted Man in China: My Journey from Scientist to Enemy of the State** by Fang Lizhi, *reviewed by* Chintamani Mande and Shekhar C. Mande ■ 2184  
**Annual Review of Pathology: Mechanisms of Disease, 2015**, Abul K. Abbas, Stephen J. Galli and Peter M. Howley (eds), *reviewed by* Sanjay A. Pai
- 

#### PERSONAL NEWS

- 2186 **Noshir Hormusji Wadia (1925–2016)**, Asha Kishore
- 



◀ COVER. Photograph of the neutron instruments at Dhruva reactor. See page 2067.

Indexed in CURRENT CONTENTS/GEOTitles/CHEMICAL ABSTRACTS/IndMED/SCOPUS/  
WEB OF SCIENCE

# CURRENT SCIENCE

Volume 110 Number 12

25 June 2016

2206 In this issue

**GUEST EDITORIAL**

- 2207 **Bengaluru's reality: towards unlivable status with unplanned urban trajectory**  
T. V. Ramachandra and Bharath H. Aithal

**CORRESPONDENCE**

- 2209 **Are we finally walking the Planck?**, B. G. Sidharth ■ 2210 **India's share of world research according to Science and Engineering Indicators 2016**, Gangan Prathap ■ 2210 **DBT/MST should fund prudently**, A. S. Rao

**NEWS**

- 2211 **IARI library dedicated in the name of Professor M. S. Swaminathan**, P. C. Kesavan ■ 2212 **Big and open data**, Usha Mujoo Munshi and Neeta Verma ■ 2213 **Management of *Phytophthora* – a deadly plant pathogen**, P. Chowdappa, V. Sridhar, P. V. R. Reddy, S. Sriram and S. P. Mohan Kumar

**COMMENTARY**

- 2216 **Futurology of farm extension services in India**  
S. K. Dubey, U. S. Gautam, J. P. Sharma, A. K. Singh and Uma Sah

**SCIENTIFIC CORRESPONDENCE**

- 2218 **Assessment of schoolchildren for congenital heart disease using murmurs and blood pressure as markers**  
Prasanta K. Borah, Utpala Devi, Hem Ch Kalita, Suman K. Paine, Meenakshi Sharma and Jagadish Mahanta
- 2219 **Comparative evaluation of protein content in groundnut samples by near infrared reflectance spectroscopy and Skalar colorimetric methods**  
Swati Chaudhury, Kanwar L. Sahrawat, K. Srinivasu, Suhas P. Wani and Naveen Puppala
- 2220 **Advertisement calls of Amboli leaping frog *Indirana chiravasi* (Anura: Ranixalidae) from northern Western Ghats, India**  
Nikhil Modak, Neelesh Dahanukar, Hemant Ogale and Anand Padhye
- 2223 **Ground foraging behaviour of Malayan giant squirrel (*Ratufa bicolor*)**  
Samrat Sengupta, Hilloljyoti Singha and Panna Deb

**GENERAL ARTICLES**

- 2226 **Research productivity of Indian physiotherapists – a review of MEDLINE**  
K. Hariohm, V. Prakash and J. Saravan Kumar
- 2231 **Training, research and application in hydrology and water resources development and management – how to bridge the gap?**  
Rakesh Kumar, R. D. Singh, Manohar Arora, J. P. Patra and T. R. Sapra
- 2239 **How do the stakeholders perceive plant variety protection in Indian seed sector?**  
P. Venkatesh, I. Sekar, G. K. Jha, Premlata Singh, V. Sangeetha and Suresh Pal

**RESEARCH ARTICLES**

- 2245 **Ground-zero met-ocean observations and attenuation of wind energy during cyclonic storm *Hudhud***  
R. Harikumar, T. M. Balakrishnan Nair, B. M. Rao, Rajendra Prasad, P. Ramakrishna Phani, C. Nagaraju, M. Ramesh Kumar, C. Jeyakumar, S. S. C. Sheno and Shailesh Nayak

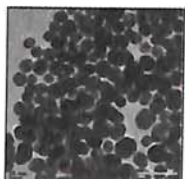


- 2253 **Carbon stocks in natural and planted mangrove forests of Mahanadi Mangrove Wetland, East Coast of India**  
S. C. Sahu, Manish Kumar and N. H. Ravindranath
- 2261 **Autodetection in *Helicoverpa armigera* (Hubner)**  
N. Bakthavatsalam, J. Vinutha, P. Ramakrishna, A. Raghavendra, K. V. Ravindra and A. Verghese
- 2268 **Exploring South Indian Iron Age megalithic burial site for its habitational and spatial distribution over the Kaveri landscape at Koppa, Karnataka, India**  
R. Arjun



#### RESEARCH COMMUNICATIONS

- 2276 **Exploring the *h*-type measure and its theoretical model in the context of e-commerce**  
Bingjia Shao, Feng Xiao and Star X. Zhao
- 2280 **Nutritional status and infant mortality rate in Saiha district, Mizoram, India**  
Vishwambhar Prasad Sati and Lalrinpuia Vangchhia
- 2285 **Assessment of polycyclic aromatic hydrocarbons and heavy metals pollution in soils of Guwahati city, Assam, India**  
Momita Das, Devendra Kumar Patel, Arup Kumar Sarma, Binode Kumar Baruah, Sofia Banu and Jibon Kotoky
- 2292 **Measurement of tsunami wave eigenfunctions in deep, intermediate and shallower regions**  
Sudhir Kumar Chaturvedi, Ugur Guven and Pankaj Kumar Srivastava
- 2297 **A method for synthesis of gold nanoparticles using 1-amino-2-naphthol-4-sulphonic acid as reducing agent**  
Pooja Rawat, Y. S. Rajput, Mahesh K. Bharti and Rajan Sharma



#### LIVING LEGENDS IN INDIAN SCIENCE

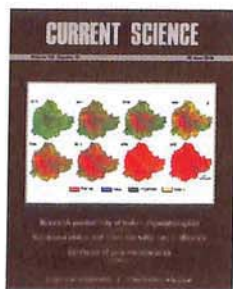
- 2301 **M. S. Raghunathan, T. N. Venkataramana**

#### BOOK REVIEWS

- 2305 **Drug Design and Discovery in Alzheimer's Disease**, Atta-ur-Rahman and Muhammad Iqbal Choudhary (eds), *reviewed by* Sarada Subramanian ■ 2306 **Waves and Oscillations in Nature: An Introduction**, A. Satya Narayanan and Swapan K. Saha, *reviewed by* M. Lakshmanan ■ 2307 **Solar Energy: An Introduction** by Michael E. Mackay, *reviewed by* Sheela K. Ramasesha

#### HISTORICAL NOTES

- 2309 **Ghulām Husain Jaunpūrī, an early 19th century modern Indian astronomer**  
R. C. Kapoor



- ◀ COVER. Urban growth in Bengaluru (based on temporal data acquired through space-borne sensors). See page 2207.

Indexed in CURRENT CONTENTS/GEOBASE/CHEMICAL ABSTRACTS/IndMED/SCOPUS/  
WEB OF SCIENCE



# CURRENT SCIENCE

Volume 111 Number 1

10 July 2016



6 **In this issue**

**GUEST EDITORIAL**

7 **Rare diseases need our attention**

V. M. Katoch, P. P. Majumder and A. Bhattacharya

**CORRESPONDENCE**

- 9 **A snapshot of research papers in non-English languages**, Nitin Kumar, Yatish Panwar and G. Mahesh ■ 10 **Plate tectonics at the blink of an eye**, Vineet Gahalaut ■ 11 **The exclusion zone of Narora Atomic Power Station – a control hothouse**, Arti Garg, Vineet Singh and Jitendra Pandey

**NEWS**

- 13 **Science Last Fortnight**, edited by K. P. Madhu and Gita Madhu ■ 17 **Learning from the Nepal's earthquake for preparedness through transboundary collaboration among experts of Himalayan countries**, Clementine Makower and Pushkin Phartiyal ■ 19 **Sustainable tea production**, Kavya Dashora, Ravi Khetarpal, Akanksha Nagpal, N. Muraleedharan and Somnath Roy

**OPINION**

- 21 **Cultivation of potato on abiotic stress-affected soils of India**  
Sunil Londhe

**COMMENTARY**

- 23 **Forensic analysis of narcotic drugs – challenges and opportunities**  
Kanak Lata Verma, Madhulika Sharma and Rajendra Kumar Sarin

**SCIENTIFIC CORRESPONDENCE**

- 25 **Auxin transport inhibitor 2,3,5 triiodobenzoic acid induced direct shoot morphogenesis in *Millingtonia hortensis* L.f.**  
Smitha Hegde and L. D'Souza
- 27 **Radiocarbon dating of charcoal samples from Rakhigarhi, Haryana, India using accelerator mass spectrometer**  
Mayank N. Vahia, Pankaj Kumar, Abhijeet Bhogale, D. C. Kothari, Sundeep Chopra, Vasant Shinde, Nilesh Jadhav and Ranvir Shastri

**GENERAL ARTICLES**

- 29 **A retrospective view of noise pollution control policy in India: status, proposed revisions and control measures**  
N. Garg and S. Maji
- 39 **Roadmap for rural India**  
Anil K. Rajvanshi
- 44 **Redesigning the instructional act in Romanian higher education**  
Cristina Silvia Nistor and Adela Deaconu

**SPECIAL SECTION: RAWEX-GVAX**

52 **Preface**

K. Krishna Moorthy, S. K. Satheesh and V. R. Kotamarthi

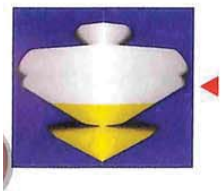


- 53 **Evolution of aerosol research in India and the RAWEX–GVAX: an overview**  
K. Krishna Moorthy, S. K. Satheesh and V. R. Kotamarthi
- 76 **Simulation of aerosol fields over South Asia using CHIMERE – part-I: spatio-temporal characteristics and heterogeneity**  
N. Srivastava, S. K. Satheesh, Nadege Blond and K. Krishna Moorthy
- 83 **Simulation of aerosol fields over South Asia using CHIMERE – part-II: performance evaluation**  
N. Srivastava, S. K. Satheesh, Nadege Blond and K. Krishna Moorthy
- 93 **Humidity bias and effect on simulated aerosol optical properties during the Ganges Valley Experiment**  
Yan Feng, M. Cadet, V. R. Kotamarthi, R. Renju and C. Suresh Raju
- 101 **Doppler Lidar observations over a high altitude mountainous site Manora Peak in the central Himalayan region**  
D. V. Phanikumar, K. K. Shukla, M. Naja, N. Singh, S. Sahai, R. Sagar, S. K. Satheesh, K. K. Moorthy, V. R. Kotamarthi and Rob K. Newsom
- 109 **Variations in the cloud-base height over the central Himalayas during GVAX: association with the monsoon rainfall**  
Narendra Singh, Raman Solanki, N. Ojha, M. Naja, U. C. Dumka, D. V. Phanikumar, Ram Sagar, S. K. Satheesh, K. Krishna Moorthy, V. R. Kotamarthi and S. K. Dhaka
- 117 **Spring-time enhancement in aerosol burden over a high-altitude location in western trans-Himalaya: results from long-term observations**  
Sobhan Kumar Kompalli, S. Suresh Babu, Lakshmi N. Bharatan and K. Krishna Moorthy
- 132 **High-frequency vertical profiling of meteorological parameters using AMF1 facility during RAWEX–GVAX at ARIES, Nainital**  
Manish Naja, Piyush Bhardwaj, Narendra Singh, Phani Kumar, Rajesh Kumar, N. Ojha, Ram Sagar, S. K. Satheesh, K. Krishna Moorthy and V. R. Kotamarthi

---

#### RESEARCH ARTICLES

- 141 **Moon echoes from the 53 MHz MST radar at Gadanki, India**  
A. K. Patra and T. Rajendra Prasad
- 147 **Modelling biome shifts in the Indian subcontinent under scenarios of future climate change**  
Dina N. Rasquinha and Mahesh Sankaran
- 157 **Laboratory similarity test relevant to salt cavern construction in interlayer-containing moulded saliferous aggregates specimen**  
De-Yi Jiang, Liang Yi, Jie Chen, Song Ren, Hua-Fu Qiu and Yin-Ping Li
- 168 **Organic matter source in the freshwater tropical lakes of southern India**  
R. Vijayaraj and Hema Achyuthan
- 177 **Diversity of *Magnetospirillum* sp. from the southern coast of India**  
Jobin John Jacob, T. Revathy, M. A. Jayasri and K. Suthindhiran
- 184 **Analysis of community structure and species richness of protozoa-enriched rumen metagenome from Indian Surti by shotgun sequencing**  
Ravi K. Shah, Amrutlal K. Patel, Tejas M. Shah, Krishna M. Singh, Neelam M. Nathani and Chaitanya G. Joshi
- 192 **Evaluation of the counting success of pheromone-baited trap with electronic control unit**  
Gon a Ece Özcan, Osman Çiçek, Korhan Enez and Mustafa Yildiz
- 



## RESEARCH COMMUNICATIONS

- 198 **Very low latitude whistlers ( $L = 1.08$ ): arrival azimuth determination**  
Sneha A. Gokani and Rajesh Singh
- 201 **A synoptic-scale perspective of heavy rainfall over Chennai in November 2015**  
A. Chakraborty
- 207 **Impact of temporal change of land use and cropping system on some soil properties in northwestern parts of Indo-Gangetic Plain**  
Jaya N. Surya, G. S. Sidhu, Tarsem Lal, D. K. Katiyar and Dipak Sarkar

---

## BOOK REVIEWS

- 213 **||Parāśaratantra|| Ancient Sanskrit Text on Astronomy and Natural Sciences** by R. N. Iyengar, *reviewed by* S. Balachandra Rao ■ **214 Environmental Policies in Asia: Perspectives from Seven Asian Countries**, Jing Huang and Shreekant Gupta (eds), *reviewed by* Shalini Dhyani and S. K. Goyal

---

## PERSONAL NEWS

- 216 **Pradeep Baburao Joshi (1957–2016)**  
Shrikant R. Kokare

---

## HISTORICAL NOTES

- 217 **Meghnad Saha and his contributions**  
Pramod V. Naik
- 



- ◀ COVER. WRF-Chem model simulations of aerosols and meteorology over India and surrounding regions for the last week of March, 2012, carried out as a part of RAWEX–GVAX. See special section.

The editor thanks Dr K. Krishna Moorthy, Dr S. K. Satheesh and Dr V. R. Kotamarthi for agreeing to be guest editors for the special section.

Indexed in CURRENT CONTENTS/GEOTitles/CHEMICAL ABSTRACTS/IndMED/SCOPUS/  
WEB OF SCIENCE



# CURRENT SCIENCE

238 **In this issue**

**GUEST EDITORIAL**

- 239 **Biomedical research in India: paradigm shift to translation**  
Govindarajan Padmanaban and Renu Swarup

**CORRESPONDENCE**

- 241 **Rediscovering our universities by increasing their level of support**, M. Periasamy  
 ■ 241 **Leading Indian higher education institutions and the Leiden 2016 ranking**, Gangan Prathap ■ 243 **Relocation of *Ophioglossum gramineum* Willd (Ophioglossaceae)**, Kishore S. Rajput, Ronak N. Kachhiyapatel, V. M. Raole and Anirudh Pratap Singh

**NEWS**

- 244 **Science Last Fortnight**, edited by K. P. Madhu and Gita Madhu ■ 246 **Visit KKNPP – an initiative for public understanding of nuclear power**, J. Devaprakash  
 ■ 247 **Science writing workshop**, K. P. Madhu

**OPINION**

- 250 **Would scientists be willing to write anonymous papers?**

**COMMENTARY**

- 252 **Drug discovery research in India**  
Madhu Dikshit and D. K. Dikshit

**SCIENTIFIC CORRESPONDENCE**

- 256 **Natural resource conservation through weather-based agro-advisory**  
D. R. Palsaniya, S. K. Rai, Purusottam Sharma, Satyapriya and P. K. Ghosh
- 258 **Mitochondrial genome sequence of *Oryza sativa indica* cultivar RP Bio-226**  
Mettu Madhavi Reddy and Kandasamy Ulaganathan
- 261 **Cysted forms of halophilic microalga *Dunaliella salina* under different stress conditions**  
Suman Keerthi, Uma Devi Koduru, Subba Rao Durvasula Venkata and Nittala Subrahmanya Sarma

**GENERAL ARTICLES**

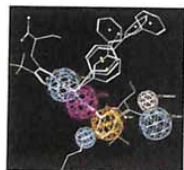
- 263 **Evolving human dimensions and the need for continuous health assessment of Indian rivers**  
Ipsita Nandi, Ananya Tewari and Kavita Shah
- 272 **Scaling-up of protected cultivation in Himachal Pradesh, India**  
Anil K. Choudhary

**SPECIAL SECTION: INTEGRATIVE MEDICINE**

- 278 **Preface**  
S. R. Narahari, Terence J. Ryan and M. Guruprasad Aggithaya
- 280 **Expanding the scientific horizon of integrative medicine**  
S. R. Narahari, Terence J. Ryan and M. Guruprasad Aggithaya



- 283 **Manasamitra Vataka and Shirodhara treatments preserve slow wave sleep and promote sleep continuity in patients with generalized anxiety disorder and comorbid generalized social phobia**  
Basavaraj R. Tubaki, Anupriya Verma, Arun Sasidharan, S. Sulekha, T. N. Sathyaprabha, D. Sudhakar, C. R. Chandrashekar, G. S. Lavekar and Bindu M. Kutty
- 293 **Status of regulation on traditional medicine formulations and natural products: Whither is India?**  
Nandini K. Kumar and Pradeep Kumar Dua
- 302 **Developing an integrative medicine patient care protocol from the existing practice of Ayurveda dermatology**  
S. R. Narahari, Madhur G. Aggithaya, Sara E. Morrow and Terence J. Ryan
- 318 **Integrative medicine atlas of skin diseases**  
S. R. Narahari and Madhur G. Aggithaya
- 325 **Disorders of pigmentation of the skin – hypotheses underlying interventions by multiple systems of medicine: is there a role for integrated medicine?**  
Sanju Arianayagam and Terence J. Ryan
- 337 **Reverse pharmacology effectuated by studies of Ayurvedic products for arthritis**  
Ashwinikumar Raut, Girish Tillu and Ashok D. B. Vaidya
- 343 **The integration of complementary and alternative medicine: the way forward for the health of skin and gut**  
Dilraj S. Kalsi and Terence J. Ryan
- 351 **Integrated care and leprosy in India: a role for Indian systems of medicine and traditional health practice in the eradication of leprosy**  
David Chandler




---

#### RESEARCH ARTICLES

- 356 **Chemometric modelling of PPAR- $\alpha$  and PPAR- $\gamma$  dual agonists for the treatment of type-2 diabetes**  
Neha Verma and Usha Chouhan
- 368 **Influence of variable bifurcation angulation and outflow boundary conditions in 3D finite element modelling of left coronary artery on coronary diagnostic parameter**  
Kalimuthu Govindaraju, Irfan Anjum Badruddin, Girish N. Viswanathan, Sarfaraz Kamangar, N. J. Salman Ahmed and Abdullah A. A. Al-Rashed
- 375 **Canopy temperature and water relations of kiwifruit cultivar Allison in response to deficit irrigation and *in situ* moisture conservation**  
Preet Pratima, N. Sharma and D. P. Sharma
- 380 **Conservation effectiveness across state and community forests: the case of Jaintia Hills, Meghalaya, India**  
Rajkamal Goswami, Muneeswaran Mariappan, Thangjam Somendro Singh and T. Ganesh
- 388 **Studies on bio-pretreatment of pine needles for sustainable energy thereby preventing wild forest fires**  
R. K. Dwivedi, R. P. Singh and T. K. Bhattacharya

---

#### RESEARCH COMMUNICATIONS

- 395 **Histological analysis of somatic embryogenesis in Itoh peony**  
E. V. Boltenev, E. V. Kuritskaya and E. V. Vrzhošek
- 398 **Nature of forest fires in Uttarakhand: frequency, size and seasonal patterns in relation to pre-monsoonal environment**  
Ripu Daman Singh, Surabhi Gumber, Pankaj Tewari and S. P. Singh





- 404 **Flowering and fruiting patterns of woody species in the tropical montane evergreen forest of southern India**  
D. Mohandass, Alice C. Hughes and Priya Davidar
- 416 **Record of Gondwana plant mega- and microfossils in Nimugudem area, Telangana, India: palynodating and palaeoenvironmental interpretation**  
Neerja Jha, Harinam Joshi and Shreya Mishra

---

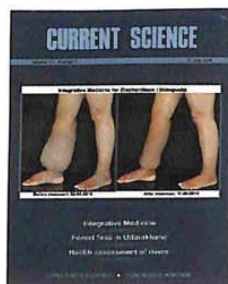
#### BOOK REVIEWS

- 425 **Water Resource Economics: Towards a Sustainable Use of Water for Irrigation in India** by M. G. Chandrakanth, *reviewed by* Mahadev G. Bhat ■ 426 **Reaction Mechanism in Organic Chemistry, Revised Edition**, S. M. Mukherji and S. P. Singh, *reviewed by* E. N. Prabhakaran ■ 427 **Combating Hunger and Achieving Food Security** by M.S. Swaminathan, *reviewed by* S. Mahendra Dev

---

#### PERSONAL NEWS

- 429 **Vinod V. Modi (1929–2016)**  
Anjana Desai
- 



- ◀ COVER. Integrating Modern Medicine and Ayurveda for treating chronic diseases. See special section.

The editor thanks Dr S. R. Narahari and Dr M. Guruprasad Aggithaya, Institute of Applied Dermatology, Uliyathadka, Madhur Road, Kasaragod 671 124, India; Dr Terence J. Ryan, Department of Dermatology, Churchill Hospital, Oxford, Headington OX3 7LE, UK for agreeing to be guest editors for the special section.

Indexed in CURRENT CONTENTS/GEODATABASE/CHEMICAL ABSTRACTS/IndMED/SCOPUS/  
WEB OF SCIENCE

# CURRENT SCIENCE

Volume 111 Number 3

10 August 2016

---

**450 In this issue**


---

**GUEST EDITORIAL**

- 451 Fundamental and applied research for the 'Make in India' programme**  
S. V. Ghaisas and S. Ananthkrishnan
- 

**CORRESPONDENCE**

- 453 Selecting science journals: riddles and revelations**, Govindasamy Agoramoorthy  
 ■ **454 Publication of nomenclatural novelties**, Gopal Krishna, Shuvadeep Majumdar, Subir Bandyopadhyay and Avishek Bhattacharjee
- 

**NEWS**

- 455 Science Last Fortnight** ■ **457 Physics training and talent search programme**, Raghavan Rangarajan, G. Rajasekaran, S. V. M. Satyanarayana, M. Sivakumar and Sudha Shenoy ■ **458 Predhiman Krishan Kaw bags the 2015 Subrahmanyam Chandrasekhar Prize of Plasma Physics**, Sameen Ahmed Khan
- 

**RESEARCH NEWS**

- 459 Factories, microbes and biotechnology**  
Sarah Iqbal
- 

**COMMENTARY**

- 461 World university rankings and subject ranking in engineering and technology (2015–2016): a case for greater transparency**  
M. K. Surappa
- 

**SCIENTIFIC CORRESPONDENCE**

- 465 Early Eocene (~50 m. y.) legume fruits from Rajasthan**, Anumeha Shukla and R. C. Mehrotra ■ **467 Pallas's or Great Black-headed gull's (*Larus ichthyæetus*) feeding preference for toxic Lunartail puffer (*Lagocephalus lunaris*)**, Tridip Kumar Datta, Surajit Bhadra Roy, Shruti Sengupta, Anil Mohapatra and G. Maheswaran
- 

**GENERAL ARTICLE**

- 470 Mapping excellence and diversity of research performance in India**  
Gangan Prathap
- 

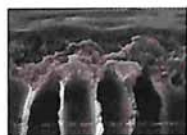
**REVIEW ARTICLE**

- 475 Diversity of the germplasm of *Saccharum* species and related genera available for use in directed breeding programmes for sugarcane improvement**  
A. K. Shrivastava and Sangeeta Srivastava
- 

**RESEARCH ARTICLES**

- 483 A parametric study of the effect of arterial wall curvature on non-invasive assessment of stenosis severity: computational fluid dynamics study**  
Kalimuthu Govindaraju, Girish N. Viswanathan, Irfan Anjum Badruddin, Sarfaraz Kamangar, N. J. Salman Ahmed and Abdullah A. A. Al-Rashed
- 492 Wind turbine noise – a pilot study in India**  
G. Arivukkodi, S. Kanmani and S. Gomathinayagam

- 500 **Climatology of horizontal winds in the lower and middle atmosphere over an equatorial station – Thiruvananthapuram**  
Geetha Ramkumar and Veena Suresh Babu



- 509 **An assessment of ambient air quality in Shimla city**  
Rajiv Ganguly and Shabnam Thapa

- 517 **Treatment of wastewater containing volatile organics using hollow fibre PDMS-polysulfone membrane system: recovery of organics and water reclamation**  
Bhavika H. Rajai, Ankit M. Kansara and Puyam S. Singh



- 524 **Estimation of aquifer parameters from surficial resistivity measurement in a granitic area in Tamil Nadu**  
N. C. Mondal, A. Bhuvaneshwari Devi, P. Anand Raj, S. Ahmed and K. V. Jayakumar

- 535 **Hematite-rich concretions from Mesoproterozoic Vindhyan sandstone in northern India: a terrestrial Martian 'blueberries' analogue with a difference**  
Jayanta K. Pati, Kamal L. Pruseth, Rajat S. Chatterjee, Suresh C. Patel, Kuldeep Prakash, Munmun Chakravorty, Ram P. Singh, Rabi Bhushan, Vivek P. Malviya, Richa Sharma and Prashanta K. Champati Ray

- 543 **Conservation of a fragmented population of blackbuck (*Antelope cervicapra*)**  
M. B. Prashanth, A. Saravanan, M. Mathivanan and T. Ganesh

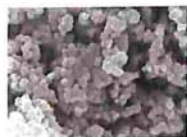
#### RESEARCH COMMUNICATIONS



- 550 **Permafrost studies in Kullu district, Himachal Pradesh**  
S. K. Allen, J. Fiddes, A. Linsbauer, S. S. Randhawa, B. Saklani and N. Salzmann

- 553 **Identification of potential glacial lake sites and mapping maximum extent of existing glacier lakes in Drang Drung and Samudra Tapu glaciers, Indian Himalaya**

U. S. Maanya, Anil V. Kulkarni, Alok Tiwari, Enakshi Dasgupta Bhar and J. Srinivasan



- 560 **Characterization of hazardous solid waste (soot) accumulated in tailpipe of typical Indian share autos**  
Ravi Sahu, Prasenjit Adak and Suresh Pandian Elumalai

- 565 **Climate change impacts on crop water balance of maize (*Zea mays* L.) in lower Krishna River Basin of South India**  
K. S. Reddy, M. Kumar, V. Maruthi, P. Lakshminarayana, Vijayalakshmi, B. Umesha and Y. V. K. Reddy

#### BOOK REVIEWS

- 571 **The Triumph of Seeds** by Thor Hanson, *reviewed by* Sudhirendar Sharma ■ **571 Mathematics of Planet Earth: Mathematicians Reflect on How to Discover, Organize, and Protect our Planet**, Hans Kaper and Christiane Rousseau (eds), *reviewed by* Shrisha Rao

#### PERSONAL NEWS

- 573 **Sailendra Nath Roy Chaudhury (1923–2016)**, S. C. Kaushal and S. N. Ghosh



◀ COVER. Pallas's gull (*Larus ichthyaetus*). See page 467.

Indexed in CURRENT CONTENTS/GEOBASE/CHEMICAL ABSTRACTS/IndMED/SCOPUS/  
WEB OF SCIENCE



# CURRENT SCIENCE

Volume 111 Number 4

25 August 2016

598 In this issue

## GUEST EDITORIAL

599 **Solar-DC: India towards energy independence**  
Ashok Jhunjunwala

## CORRESPONDENCE

601 **Shanghai rankings 2016: poor performance of Indian universities**, Hardev Singh Virk ■ 601 **Coping with disability – suggestions to institutions**, M. Vijayan  
■ 602 **Measurement of background radiation**, R. Mohanty; *Response by* Debashish Sengupta

## NEWS

605 **Science Last Fortnight** ■ 609 **CSIR-NPL establishes facility for efficiency validation of solar cells**, Sushil Kumar and D. K. Aswal ■ 609 **Technology Vision 2035**, Parul R. Sheth

## OPINION

612 **Air pollution linked to destruction of green belts in Delhi: a harsh reality**  
Mayank Tripathi

## COMMENTARY

613 **Enabling holistic approach towards women's health through Draft National Health Policy, 2015**  
Sunita Sangar

## SCIENTIFIC CORRESPONDENCE

615 **Genetic fidelity studies in tissue culture raised plantlets of Himalayan poplar (*Populus ciliata* Wall.)**

Ayesh Gaur, Gaurav Aggarwal, Pankaj Kumar and D. K. Srivastava

617 **Influence of flower colour and seasonality on plant invasion success**

R. Indhar Saidanyan, N. Kamaladhasan, N. Krishnankutty and S. Chandrasekaran

620 **Automobile exhaust pollution: an imperceptible threat to sericulture in Kashmir, India**

Faroz Ahmad Ahanger, Ruqeya Nazir and Irfan Illahi

621 **Siderophores of haloalkaliphilic archaea from Lonar lake, Maharashtra, India**

Jaysing Patil, Priyanka Suryawanshi and Shyam Bajekal

## TECHNICAL NOTES

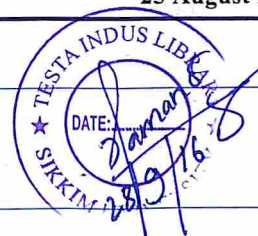
624 **A differential electrometer for vector electric field measurements on a balloon platform**

K. Jawahar, S. Manu and S. Gurubaran

## GENERAL ARTICLES

627 **Reflecting on the International Year of Light and light-based technologies**

Sameen Ahmed Khan



- 632 **Food security indicators in India compared to similar countries**

A. Amarender Reddy

---

**REVIEW ARTICLE**

- 641 **Advanced trends in treatment of wounds**

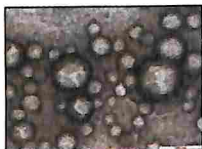
Oshin John Miranda and Ganga Srinivasan

---

**RESEARCH ARTICLES**

- 648 **Hepatitis B virus genome analysis in patients of hepatocellular carcinoma and asymptomatic carriers from northern, southern and North East India**

Manash Pratim Sarma, Giasuddin Ahmed, Subhash Medhi and Premashis Kar



- 662 **Ligand-tagged cationic liposome facilitates efficient gene delivery to folate receptors**

Sridevi Gorle, Alisha Sewbalas, Mario Ariatti and Moganavelli Singh

- 671 **Upregulation of Th1 polarization by *Taraxacum officinale* in normal and immune suppressed mice**

Kiranjeet Kour, Sarang Bani, Payare Lal Sangwan and Ajaydeep Singh

- 686 **Perennial to ephemeral transformation of a Lesser Himalayan watershed**

Jiwan Singh Rawat, Ajit Govind, Geeta Rawat, Mallickarjun Joshi, Shive Prakash Rai and Navneet Gahlot

- 694 **Effect of numerical truncation error on implicit finite difference methods in groundwater transport models**

K. V. Sruthi and Kim Hyun-su

- 700 **Bus travel time prediction under high variability conditions**

Kranthi Kumar Reddy, B. Anil Kumar and Lelitha Vanajakshi

---

**RESEARCH COMMUNICATIONS**

- 712 **Low-cost renewable hydrogen production using solar photovoltaic panel**

Saurabh Sonwani and Ram Prasad

- 717 **Modelling of declining groundwater depth in Kurukshetra district, Haryana, India**

G. T. Patle, D. K. Singh and A. Sarangi

- 723 **DB IndAlgae: an on-line resource of marine algae from India identified on the basis of molecular and morphological features**

Satej Bhushan, Richa Mehra, Pooja Rani and Felix Bast



- 727 **Trends, periodicities and discontinuities of precipitation in the Huangfuchuan Watershed, Loess Plateau, China**

Yi He, Xingmin Mu, Peng Gao, Guangju Zhao, Fei Wang, Wenyi Sun, Pengfei Li and Jinxi Song

- 733 **Predatory stress paradigm to induce anxiety-like behaviour in juvenile male C57BL/6J mice**

Abraão Tiago Batista Guimarães, Joyce Moreira de Souza, Wellington Alves Mizaél da Silva, Bruna de Oliveira Mendes, Joice Gomes de Queiroz, André Luis da Silva Castro and Guilherme Malafaia

- 739 **Transplantation worthiness of cryopreserved germ cells of Indian major carp rohu, *Labeo rohita***

S. Patra, G. Mishra, S. K. Dash, D. K. Verma, S. Nandi, P. Jayasankar and P. Routray



- 747 **Foliar litter decomposition of four dominant tree species in the Hollongapar Gibbon Wildlife Sanctuary, Assam, North East India**

Moumita Sarkar, Ashalata Devi and Monoranjan Nath

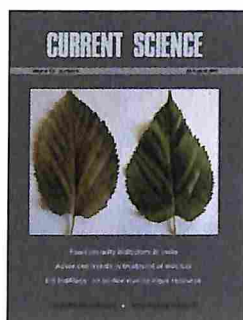
- 753 **ERRATUM: Status of regulation on traditional medicine formulations and natural products: Whither is India?**  
Nandini K. Kumar and Pradeep Kumar Dua [*Curr. Sci.*, 2016, **111**, 293–301]
- 

**BOOK REVIEWS**

- 754 **Essentials of Botanical Extraction: Principles and Applications**, Subhash C. Mandal, Vivekananda Mandal and Anup Kumar Das, *reviewed by* Sarada Subramanian
- 755 **Where Mathematics Goes Wrong...: Mathematical Fallacies, Howlers & Number Tricks....**, Sachin Vyavahare and V. K. Mangwani, *reviewed by* Wallace Jacob
- 

**PERSONAL NEWS**

- 756 **B. P. Chandra (1946–2015)**  
Hardev Singh Virk
- 



- ◀ **COVER.** Effect of automobile pollution on the quality of fresh mulberry leaves. Left, Leaf from a plantation near the roadside; right, Leaf from a plantation far away from the road. See page 620.

Indexed in CURRENT CONTENTS/GEOBASE/CHEMICAL ABSTRACTS/IndMED/SCOPUS/  
WEB OF SCIENCE