

## VOLUME CONTENTS

Volume 89 Number 1

10 July 2005

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3	<b>In this issue</b>
	<b>GUEST EDITORIAL</b>
5	<b>Balancing the equation</b> Gautam R. Desiraju
	<b>CORRESPONDENCE</b>
7	<b>Einstein, Gandhi, Nehru and Tagore and their invariant principles</b> , Arawind S. Parasnis ■ <b>7 Universities and Vice-Chancellors</b> , D. P. Gupta ■ <b>8 Shed cloak of prejudice <i>vis-à-vis</i> women</b> , T. Prem Anand ■ <b>8 Projects in schools and colleges</b> , A. K. Biyani ■ <b>9 Predicting potential geographic distributions of invading species</b> , A. Townsend Peterson ■ <b>10 'Lakes for sale' – A disturbing development</b> , R. V. Karanth ■ <b>10 The living root bridges of Meghalaya</b> , Rosamma Mathew ■ <b>11 Organic farming</b> , M. H. Mehta ■ <b>12 Buckingham Canal saved people in Andhra Pradesh (India) from the tsunami of 26 December 2004</b> , B. Ramalingeswara Rao
14	<b>From the archives</b>
	<b>NEWS</b>
14	<b>P. Balaram takes over as Director, Indian Institute of Science, Bangalore</b> ■ <b>15 Coping with disasters in future: Some Indian initiatives</b> , R. K. Chadha and Kusala Rajendran ■ <b>16 Genetically modified organisms – Biosafety aspects</b> , Monika Koul Moza ■ <b>17 DRDO research grants</b>
	<b>COMMENTARY</b>
18	<b>Relevance of geology</b> , B. P. Radhakrishna
	<b>OPINION</b>
21	<b>Deemed university status to national laboratories: Need for a national debate</b> , N. Raghuram
	<b>TECHNICAL NOTES</b>
23	<b>A precise control of AC servo motor using neural network PID controller</b> , Geum-Bae Cho and Pyoung-Ho Kim
	<b>SCIENTIFIC CORRESPONDENCE</b>
30	<b>Effect of tsunami on coastal crop husbandry in parts of Nagapattinam district, Tamil Nadu</b> , H. Chandrasekharan, V. P. Singh, D. U. M. Rao, M. Nagarajan and B. Chandrasekaran ■ <b>32 Was there active tsunami generation during 28 March 2005 Sumatra earthquake?</b> , Vijay K. Agarwal, Neeraj Agarwal and Rajkumar ■ <b>34 Impact of tsunami on meiofauna of Marina beach, Chennai, India</b> , K. Altaff, J. Sugumaran and Md. S. Naveed ■ <b>38 Phylogeography and origin of Indian domestic cattle</b> , Mumtaz Baig, Albano Beja-Pereira, Rizwan Mohammad, Kashinath Kulkarni, Samira Farah and Gordon Luikart ■ <b>41 Initial colonization of Red Pierrot butterfly, <i>Talicauda nyseus nyseus</i> Guerin (Lycaenidae) in the lower western Himalayas: An indicator of the changing environment</b> , Arun P. Singh
	<b>GENERAL ARTICLE</b>
43	<b>Paediatric ocular trauma</b> Apjit Kaur and Ajai Agrawal
	<b>SPECIAL SECTION: MICROBIAL DIVERSITY</b>
47	<b>Cyanobacterial biodiversity and potential applications in biotechnology</b> N. Thajuddin and G. Subramanian
58	<b>Fungal biodiversity: Distribution, conservation and prospecting of fungi from India</b> C. Manoharachary, K. Sridhar, Reena Singh, Alok Adholeya, T. S. Suryanarayanan, Seema Rawat and B. N. Johri
72	<b>'Unculturable' bacterial diversity: An untapped resource</b> Rakesh Sharma, Ravi Ranjan, Raj Kishor Kapardar and Amit Grover
78	<b>Extremophilic microbes: Diversity and perspectives</b> T. Satyanarayana, Chandralata Raghukumar and S. Shivaji
91	<b>Microbial diversity in desert ecosystems</b> Ashish Bhatnagar and Monica Bhatnagar

- 101 **Microbial diversity: Application of micro-organisms for the biodegradation of xenobiotics**  
Rakesh Kumar Jain, Manisha Kapur, Sumeet Labana, Banwari Lal, Priyangshu Manab Sarma, Dhruva Bhattacharya and Indu Shekhar Thakur
- 113 **Genetic diversity of pathogenic microorganisms: Basic insights, public health implications and the Indian initiatives**  
J. S. Viridi and Pooja Sachdeva
- 124 **Rumen microbial ecosystem**  
D. N. Kamra
- 136 **Diversity of plant growth and soil health supporting bacteria**  
K. V. B. R. Tilak, N. Ranganayaki, K. K. Pal, R. De, A. K. Saxena, C. Shekhar Nautiyal, Shilpi Mittal, A. K. Tripathi and B. N. Johri
- 151 **Microorganism diversity: Strategy and action plan**  
Bhavdish N. Johri, B. N. Ganguly, S. K. Goel, J. S. Viridi, A. K. Tripathi, R. K. Jain, D. N. Kamra and Ashish Bhatnagar

---

#### RESEARCH ARTICLE

- 155 **Inventorying plant biodiversity in homegardens: A case study in Barak Valley, Assam, North East India**  
Tapasi Das and Ashesh Kumar Das

---

#### RESEARCH COMMUNICATIONS

- 164 **Monsoon circulation induced variability in total column ozone over India**  
A. L. Londhe, B. Padma Kumari, J. R. Kulkarni and D. B. Jadhav
- 168 **Levels of free radical scavengers and antioxidants in post-reperused patients of myocardial infarction**  
Pushpa Bhakuni, M. Chandra and M. K. Misra
- 170 **Phototoxic effect of some porphyrin derivatives against the larvae of *Aedes aegypti*, a major vector of dengue fever**  
Veranja Karunaratne, Anura Wickramasinghe, Ajith M. C. Herath, Priyani H. Amarasinghe, S. H. P. Parakrama Karunaratne and Gamini Rajapakse
- 173 **Studies on reproductive biology of a threatened tree fern, *Cyathea spinulosa* Wall. ex Hook**  
P. B. Khare, S. K. Behera, Ruchi Srivastava and S. P. Shukla
- 177 **Isolation of endophytic plant growth promoting *Burkholderia* sp. MSSP from root nodules of *Mimosa pudica***  
Piyush Pandey, S. C. Kang and D. K. Maheshwari
- 181 **Purification of *Tomato leaf curl Bangalore virus* and production of polyclonal antibodies**  
Devaraja, Kirthi Narayanaswamy, H. S. Savithri and V. Muniyappa
- 183 **Ground penetrating radar studies of a point-bar in the Mahi River Basin, Gujarat**  
Alpa Sridhar and Atul Patidar
- 190 **Evidence of elastic strength variation across the Central Indian Tectonic Zone: A support to the Proterozoic collisional tectonics**  
Jimmy Stephen, S. B. Singh and D. B. Yedekar
- 195 **Ecological impact of tsunami on Nicobar Islands (Camorta, Katchal, Nancowry and Trinkat)**  
S. Ramachandran, S. Anitha, V. Balamurugan, K. Dharanirajan, K. Ezhil Vendhan, Marie Irene Preeti Divien, A. Senthil Vel, I. Sujjahad Hussain and A. Udayaraj
- 201 **Biomass availability and forage quality of *Eurotia ceratoides* Mey in the rangelands of Changthang, eastern Ladakh**  
Sanjay Kr. Uniyal, Anjali Awasthi and Gopal S. Rawat

---

#### BOOK REVIEWS

- 206 **Understanding Environment**, Kiran B. Chhokar *et al.* (eds), reviewed by T. V. Ramachandra and A. V. Nagarathna ■ 207 **Amphibians of Peninsular India** by R. J. Ranjit Daniels, reviewed by K. V. Gururaja ■ 208 **Walker's Carnivores of the World** by Ronald M. Nowak, reviewed by Shomita Mukherjee ■ 208 **Viruses and the Evolution of Life** by Luis P. Villarreal, reviewed by J. S. Viridi

---

#### PERSONAL NEWS: OBITUARY

- 210 **T. B. Rajashekar**, Subbiah Arunachalam and N. Balakrishnan

---

#### HISTORICAL NOTES

- 211 **Samanta's planet placing**, Prahallad Chandra Naik
-

236	<b>In this issue</b>
	<b>GUEST EDITORIAL</b>
237	<b>Foretelling the monsoon: Freedom and responsibility</b> Sulochana Gadgil and J. Srinivasan
	<b>CORRESPONDENCE</b>
239	<b>India's contribution to science</b> , Anuradha Ravi ■ <b>239 The future of postdocs</b> , A. Muthusamy and P. Mariappan ■ <b>241 CSIR/UGC (NET) exams suppress research enthusiasts</b> , S. Nilavu ■ <b>241 The American patent model</b> , T. N. Narasimhan ■ <b>242 Citation web-crawler, Google Scholar</b> , Jitendra Narayan Dash ■ <b>242 Hair sheep</b> , B. V. Nimbkar ■ <b>243 Phenology and climate change</b> , Monika Koul Moza and A. K. Bhatnagar ■ <b>244 Need for reassessment in the post-tsunami scenario</b> , A. S. Subrahmanyam and K. S. R. Murthy ■ <b>245 Why is homopterophagous butterfly, <i>Spalgis epius</i> (Westwood) (Lepidoptera: Lycaenidae) myrmecophilous?</b> , M. G. Venkatesha ■ <b>246 Sethusamudram shipping canal project and the eternal silence of the Indian earth scientists</b> , C. P. Rajendran
	<b>NEWS</b>
247	<b>Cholera: The scourge of India and Bangladesh</b> , Minakshi De ■ <b>248 Aswathanarayana receives AGU award</b> ■ <b>248 Towards a tsunami warning system in the Indian Ocean</b> , G. D. Gupta
	<b>RESEARCH NEWS</b>
250	<b>Hunting for pentaquarks</b> , B. Ananthanarayan, Ekta Makhija and K. Shivaraj
	<b>COMMENTARY</b>
252	<b>Organic farming vis-à-vis modern agriculture</b> , Rajendra Prasad
254	<b>From the archives</b>
	<b>TECHNICAL NOTES</b>
255	<b>Development and experimental investigations of extrinsic Fabry-Pérot interferometric sensor-bonding techniques for strain measurement in concrete and metallic structures</b> , Subhash Chander Jain, Nahar Singh, J. K. Chhabra, Veto Varma, J. J. Charan, K. K. Vaze, A. K. Aggarwal, H. S. Kushwaha, S. C. Dhawan and R. P. Bajpai
	<b>SCIENTIFIC CORRESPONDENCE</b>
257	<b>Mycorrhizal fossil fungi from the Miocene sediments of Mizoram, Northeast India</b> , R. K. Kar, B. D. Mandaokar and Ratan Kar ■ <b>259 Occurrence and intensity of some parasites in five sturgeon species (Chondrostei: Acipenseridae) southwest of Caspian Sea</b> , M. Sattari and B. Mokhayer
	<b>GENERAL ARTICLE</b>
264	<b>Current status of ethnomedicinal plants in the Darjeeling Himalaya</b> D. R. Chhetri, Deewa Basnet, Po Fong Chiu, Sujata Kalikotay, Gagan Chhetri and Sippy Parajuli
	<b>REVIEW ARTICLE</b>
269	<b>Anti-HIV natural products</b> Inder Pal Singh, Sandip B. Bharate and K. K. Bhutani
	<b>RESEARCH ARTICLES</b>
291	<b>Temporal and intra-plant variability of Cry1Ac expression in <i>Bt</i>-cotton and its influence on the survival of the cotton bollworm, <i>Helicoverpa armigera</i> (Hübner) (Noctuidae: Lepidoptera)</b> K. R. Kranthi, S. Naidu, C. S. Dhawad, A. Tatwawadi, K. Mate, E. Patil, A. A. Bharose, G. T. Behere, R. M. Wadaskar and S. Kranthi
299	<b>Comparative studies on trace metal geochemistry in Indian and Chinese rivers</b> Rengasamy Alagarsamy and Jing Zhang
	<b>SPECIAL SECTION: CHROMOSOMES TO FOOD SECURITY</b>
310	<b>The M. S. Swaminathan I know</b> Bruce Alberts
312	<b>Chemical mutagenesis: From plants to human</b> A. T. Natarajan

- 318 **Oxygen effect in radiation biology: Caffeine and serendipity**  
P. C. Kesavan
- 329 **Biochemical mechanisms of initiation and termination of plasmid DNA replication**  
Deepak Bastia
- 335 **Chromosome aberrations: Plants to human and Feulgen to FISH**  
A. T. Natarajan
- 341 **Mutants dissecting development and behaviour in *Drosophila***  
Adita Joshi, Shanti Chandrashekar and R. P. Sharma
- 353 **Mutagenesis: Investigating the process and processing the outcome for crop improvement**  
V. L. Chopra
- 360 **Cytogenetics for dosimetry in cases of radiation accidents and assessing the safety of irradiated food material**  
A. T. Natarajan and P. C. Kesavan
- 366 **BOOK REVIEWS: Scientist and Humanist: M. S. Swaminathan. R. D. Iyer; The Man Who Harvests Sunshine – The Modern Gandhi: M. S. Swaminathan. Andréi Erdélyi; Toward a Hunger-Free World: Life and Work of M. S. Swaminathan. Anwar Dil (ed.), Science and Agriculture: M. S. Swaminathan and the Movement for Self-Reliance. S. Ramanujam *et al.* (eds), reviewed by T. N. Ananthkrishnan**

---

#### RESEARCH COMMUNICATIONS

- 368 **Analysis of string-searching algorithms on biological sequence databases**  
S. S. Sheik, Sumit K. Aggarwal, A. Poddar, B. Sathiyabhama, N. Balakrishnan and K. Sekar
- 374 **Compositional symmetry of DNA duplex in bacterial genomes**  
Sujit Kumar Verma, Debojyoti Das, Siddharatha Sankar Satapathy, Alak Kumar Buragohain and Suvendra Kumar Ray
- 384 **Evaluation of heat acclimation and salicylic acid treatments as potent inducers of thermotolerance in *Cicer arietinum* L.**  
Usha Chakraborty and Cyaria Tongden
- 389 **Nitrogen resorption in leaves of tree and shrub seedlings in response to increasing soil fertility**  
S. P. Singh, Kiran Bargali, Asha Joshi and Smita Chaudhry
- 396 **Estimation of groundwater recharge through neutron moisture probe in Hayatnagar micro-watershed, India**  
Ramesh Chand, N. C. Mondal and V. S. Singh

---

#### BOOK REVIEWS

- 401 **Empire of the Stars. Friendship, Obsession and Betrayal in the Quest for Black Holes** by Arthur I. Miller, reviewed by Sreeram Chaulia ■ 402 **Insect Neuroendocrines** by V. B. Awasthi, reviewed by D. Muraleedharan ■ 402 **Stress: From Burnout to Balance** by Vinay Joshi, reviewed by C. C. Kartha
- 

- 
- 420 **In this issue**

#### EDITORIAL

- 421 **Institutional E-print Archives: Liberalizing Access to Scientific Research**  
N. V. Joshi

---

#### CORRESPONDENCE

- 423 **Research in science and engineering: Malady and remedy**, Suresh Chandra Tiwari ■ 423 **Plagiarism**, P. Tauro ■ 424 **Science funding in India**, Rustom Roy ■ 424 **Shallow water reservoirs and vegetation**, S. David Kingston and V. Ramadhas ■ 425 **An idea for Indian education**, J. Marvin Herndon ■ 426 **Ethics in science**, S. Ramanathan ■ 426 **Reinventing Indian universities**, D. P. Gupta ■ 426 **University system**, V. Venkateswara Sarma ■ 426 **GM rice and China**, G. Padmanaban ■ 427 **Kabi sacred grove of North Sikkim**, S. S. Dash ■ 428 **Transforming 'traditional anecdotes' to 'evidence-based medicine' and its relation to diabetes**, M. Balasubramanyam
-

## NEWS

- 429 Two Indian journals cross impact factor 1.00 in 2004, N. C. Jain ■ 430 New portal for scholarships, etc. ■ 430 Mid-year meeting of the Indian Academy of Sciences, Mrinalini G. Walawalkar ■ 433 The fluid earth, Vinod Gaur ■ 435 Channel flow, ductile extrusion and exhumation of lower-mid crust in continental collision zones, Soumyajit Mukherjee

---

## RESEARCH NEWS

- 437 Unearthing the origin of the vanishing tribes, Dyuti Bhattacharya ■ 439 Galactic encounters and ice ages in the earth's history, A. V. Sankaran

- 441 From the archives

---

## SCIENTIFIC CORRESPONDENCE

- 442 Inheritance of resistance to *Bacillus sphaericus* toxins in a laboratory selected strain of *Anopheles stephensi* (Diptera Culicidae) and its response to *Bacillus thuringiensis* var. *israelensis*, P. K. Mittal, T. Adak and S. K. Subbarao ■ 443 *Oryza rufipogon*: A possible source of novel resistance specificities against rice blast (*Magnaporthe grisea*), R. Rathour, V. S. Gaur, R. P. Kaushik and R. S. Chauhan ■ 447 Rapidly *in vitro* multiplied *Drosera* as reliable source for plumbagin bioprospection, K. Jayaram and M. N. V. Prasad ■ 449 What caused the great Sumatran earthquakes of 26 December 2004 and 28 March 2005?, N. Purnachandra Rao and A. Hanmantha Chary ■ 452 28 March 2005 Sumatra earthquake: expected, triggered or aftershock?, Vineet K. Gahalaut and Kalpna ■ 454 Borneo's proboscis monkey – a study of its diet of mineral and phytochemical concentrations, Govindasamy Agoramoorthy and Minna J. Hsu

---

## GENERAL ARTICLES

- 458 Healthcare biotechnology firms in India: Evolution, structure and growth  
Parveen Arora
- 464 The science, politics and economics of global climate change: Implications for the carbon sink projects  
James Jacob

---

## REVIEW ARTICLES

- 475 Studies on equatorial waves over the Indian zone  
M. N. Sasi, Geetha Ramkumar and B. V. Krishna Murthy
- 488 Current status, strategy and future prospects of microbial resource collections  
Dilip K. Arora, Ratul Saikia, Ram Dwivedi and David Smith

---

## RESEARCH ARTICLES

- 496 Functional genomics of drought stress response in rice: Transcript mapping of annotated unigenes of an *indica* rice (*Oryza sativa* L. cv. Nagina 22)  
Markandeya Gorantla, P. R. Babu, V. B. Reddy Lachagari, F. Alex Feltus, Andrew H. Paterson and Arjula R. Reddy
- 515 Cyanobacteria in biological soil crusts of India  
J. Tirkey and S. P. Adhikary
- 522 Remobilization of the palaeoconvergent corridors hidden under the Deccan trap cover and some major stable continental region earthquakes  
K. Veeraswamy and U. Raval

---

## RESEARCH COMMUNICATIONS

- 531 Synthesis of novel oxazolidinone derivatives for antibacterial investigation  
Y. Cui, Y. Dang, Y. Yang and R. Ji
- 535 Evaluating the association between type-2 diabetes and polymorphisms at +1127 *INS-PstI* and +3580 *IGF-II-MspI* locus  
Sarita Bagadi, Jatin K. Nagpal, Rashmi Khadapkar and Bibhu R. Das
- 539 Molecular characterization of a *Pao*-like long terminal repeat retrotransposon, *Tamy* in saturniid silkworm *Antheraea mylitta*  
Ananta K. Ghosh, Abhik Datta, B. Mahendran and S. C. Kundu
- 544 Selection of 5-methyltryptophan-resistant callus lines with improved metabolic flux towards terpenoid indole alkaloid synthesis in *Catharanthus roseus*  
Rupali Seth and Ajay Kumar Mathur

- 548 **Species diversity contributes to productivity – Evidence from natural grassland communities of the Himalaya**  
Surendra Pratap Singh, Pankaj Sah, Vidit Tyagi and Bhupendra Singh Jina
- 553 **Dissolved inorganic carbon isotopic compositions in the Upstream Ganga river in the Himalayas**  
G. J. Chakrapani and Jan Veizer
- 557 **Detection of submerged reef banks in the Lakshadweep Sea using IRS-P4 OCM satellite data**  
Prakash Chauhan and Shailesh Nayak
- 560 **Population density, microhabitat use and activity pattern of the Indian rock lizard, *Psammophilus dorsalis* (Agamidae)**  
Rajkumar S. Radder, Srinivas K. Saidapur and Bhagyashri A. Shanbhag
- 
- BOOK REVIEWS**
- 567 **Aquaculture Medicine.** Bright Singh, I. S. *et al.* (eds), reviewed by T. J. Pandian ■ 567 **Losing a Lost Tribe: Native Americans, DNA, and the Mormon Church** by Simon G. Southerton, reviewed by Y. Chaitanya Krishna and Anindya Sinha
- 
- PERSONAL NEWS**
- 569 **Amal Kumar Raychaudhuri (1923–2005),** Naresh Dadhich ■ 570 **Usha Ranjan Ghatak (1931–2005),** Brindaban C. Ranu

Volume 89 Number 4

25 August 2005

- 
- 588 **In this issue**
- 
- EDITORIAL**
- 589 **Physics – past perfect, future uncertain**  
K. R. Rao
- 
- CORRESPONDENCE**
- 591 **Building science society,** A. Rajanikanth ■ 591 **How emerging technologies can create jobs and advance the frontiers of geoscience,** U. Aswathanarayana ■ 592 **Early warning of natural hazards using satellite remote sensing,** Ramesh P. Singh ■ 593 **Two Indian journals included in PCT Minimum List,** N. C. Jain ■ 593 **Role of marine algae in organic farming,** Neelam Pereira and X. N. Verlecar ■ 594 ***Shorea robusta* – an excellent host tree for lichen growth in India,** Satya, D. K. Upreti and Sanjeeva Nayaka ■ 595 **Effect of fig trees on Bhimbetka world heritage site,** Tariq Husain and Bhaskar Datt ■ 596 **Infant mortality in tribals of central India,** Arvind Verma, Kalyan B. Saha and Dinesh Kumar
- 
- NEWS**
- 597 **India, ideal destination for clinical trials,** Minakshi De ■ 598 **X-ray fluorescence: Reading tool for ancient manuscripts,** Mrinalini G. Walawalkar ■ 599 **Recovery of endangered and threatened species: Developing a national priority list of plants and insects,** K. N. Ganeshaiyah ■ 601 **Lindau Nobel Meeting – A unique gathering,** G. P. Phondke ■ 603 ***Vijnana jijnase: Ideas of science for non-scientists,*** Sharath Ananthamurthy and Srikanth Sastry ■ 605 **Pathological techniques in diagnosis of animal, bird and fish disease,** Minakshi De
- 
- RESEARCH NEWS**
- 606 **Multiple bonds continue to fascinate chemists: Discovery of stable Si≡Si and B=O bonds,** Mrinalini G. Walawalkar
- 
- SCIENTIFIC CORRESPONDENCE**
- 608 **Isolation and characterization of an endophytic bacterium related to *Rhizobium/Agrobacterium* from wheat (*Triticum aestivum* L.) roots,** P. K. Sharma, S. Sarita and J. Prell ■ 610 ***Dactylorhiza hatagirea* (D. Don) Soo – a west Himalayan orchid in peril,** Arvind Bhatt, Soumai Kant Joshi and Sanjay Gairola ■ 612 **An M 5.2 earthquake occurs in Koyana region after 4½ years,** H. V. S. Satyanarayana, D. Shashidhar, T. Sagara Rao and M. Kousalya
- 
- GENERAL ARTICLES**
- 614 **Recombinant DNA expression products for human therapeutic use**  
G. M. Bhopale and R. K. Nanda

- 623 **Biodiversity and conservation of rhododendrons in Arunachal Pradesh in the Indo-Burma biodiversity hotspot**  
Ashish Paul, M. L. Khan, A. Arunachalam and K. Arunachalam
- 

**REVIEW ARTICLE**

- 635 *Swertia chirayita* – an overview  
P. Joshi and V. Dhawan
- 

**RESEARCH ARTICLES**

- 641 **Optimization of organic nutrients for ginseng hairy roots production in large-scale bioreactors**  
G. Sivakumar, K. W. Yu, E. J. Hahn and K. Y. Paek
- 650 **Recent developments in safety assessment of concrete gravity dams**  
J. M. Chandra Kishen
- 

**RESEARCH COMMUNICATIONS**

- 657 *In vitro* phase variation studies of *Salmonella Gallinarum* in biofilm formation  
B. Prakash, G. Krishnappa, L. Muniyappa and M. Krishna Reddy
- 659 **Detection of pathogenesis-related proteins–chitinase and *b*-1,3-glucanase in induced chickpea**  
Ratul Saikia, Bhim Pratap Singh, Rakesh Kumar and Dilip K. Arora
- 664 **Plant regeneration and genetic transformation studies in petiole tissue of Himalayan poplar (*Populus ciliata* Wall.)**  
A. K. Thakur, Sarita Sharma and D. K. Srivastava
- 668 **Comparative studies on species richness, diversity and composition of oak forests in Nainital district, Uttaranchal**  
Geeta Kharkwal, Poonam Mehrotra and Yashpal Singh Pangtey
- 673 **Population structure and regeneration status of medicinal tree *Illicium griffithii* in relation to disturbance gradients in temperate broad-leaved forest of Arunachal Pradesh**  
Rakhi Duchok, Kenyusen Kent, Ashalata Devi Khumbongmayum, Ashish Paul and M. L. Khan
- 677 **Pulse responses of an unconfined granite aquifer to precipitation – A recharge evaluation through transient water-level fluctuation**  
Rolland Andrade, D. Muralidharan and R. Rangarajan
- 681 **Zooplankton studies with special reference to krill *Euphausia superba* Dana from fishing area 58 of Indian Ocean sector in Southern Ocean**  
Vijayakumar Rathod
- 687 **Weakening trend of the southwest monsoon current through peninsular India from 1950 to the present**  
P. V. Joseph and Anu Simon
- 694 **Benthic recovery four years after an El Niño-induced coral mass mortality in the Lakshadweep atolls**  
Rohan Arthur, Terence J. Done and Helene Marsh
- 

**BOOK REVIEWS**

- 700 **Asia Unplugged: The Wireless and Mobile Media Boom in the Asia Pacific** by Madanmohan Rao and Lunita Mendoza (eds), *reviewed by* Ashok Jhunjhunwala ■ **700 Applied Statistics in Toxicology and Pharmacology** by Katsumi Kobatashi and K. Sadasivan Pillai, *reviewed by* Sharayu Paranjape ■ **702 Materials Research: Current Scenario and Future Projections** by R. Chidambaram and S. Banerjee, *reviewed by* Baldev Raj and K. Bhanu Sankara Rao
- 

**PERSONAL NEWS**

- 705 **Kunapuly Venkateswarlu (1916–2005)**, K. Babu Joseph
- 

- 723 **In this issue**
- 

**GUEST EDITORIAL**

- 725 **Anguish of a medico**  
C. C. Kartha
-

## CORRESPONDENCE

- 727 **Dwindling of groundwater resources – whose folly?**, K. C. Subhash Chandra ■ 727 **Disallow caste discrimination in biological and social contexts**, Govindasamy Agoramoorthy ■ 728 **‘Terminator . . .’ back again?**, Ashalatha S. Nair ■ 728 **Need for self-assessment of educational institutions**, V. Radhakrishnan ■ 729 **Can Habur Limestone curdle milk?**, P. S. Ranawat ■ 730 **Malaria millennium development goals, treatment costs and generics**, Revant R. Gupta and Rajeev Gupta ■ 731 **Why did the 28 March 2005 Sumatra earthquake of  $M_w$  8.7 generate only a minor tsunami?**, B. K. Rastogi
- 

## NEWS

- 733 **National Knowledge Commission constituted** ■ 733 **Medals for Indian students at Biology Olympiad** ■ 733 **A new initiative on genetics at Banaras Hindu University**, Minakshi De ■ 734 **National Water Convention**, M. N. Madhyastha
- 

## RESEARCH NEWS

- 736 **A new class of gels**, Minakshi De
- 

## OPINION

- 737 **Wilderness woes – Tribals vs tigers: Pros and cons**, V. M. Meher Homji
- 

## SCIENTIFIC CORRESPONDENCE

- 739 **Years of life lost and productivity loss due to tsunami in India**, K. Krishnamoorthy, K. T. Harichandrakumar, A. Krishna Kumari and P. K. Das ■ 741 **Iron meteorite fall at Bhuka village, Barmer district, Rajasthan**, K. L. Shrivastava, V. Gaur, J. Swadia, N. Bhandari and A. D. Shukla ■ 742 **Iron pyrites for reducing ammonia volatilization losses from fertilizer urea applied to a sandy clay loam soil**, Y. S. Shivay, Dinesh Kumar and Rajendra Prasad ■ 743 **Vertebrate circadian clock research: Do experiments on birds and lower vertebrates promise better insights?**, Vinod Kumar ■ 747 **An earthquake of  $M \sim 5$  may occur at Koyna**, Harsh Gupta *et al.*
- 

## GENERAL ARTICLES

- 749 **Links between embryology and evolutionary floral morphology**  
Peter K. Endress
- 755 **The Ganga at Varanasi and a travail to stop her abuse**  
Veer Bhadra Mishra
- 

## REVIEW ARTICLES

- 764 **Degeneration and death of neurons in adult neurodegenerative diseases**  
Pranab Kumar Sarkar
- 774 **Water quality in the Central Himalaya**  
Subodh Sharma, Roshan M. Bajracharya, Bishal K. Sitaula and Juerg Merz
- 

## SPECIAL SECTION: WATER

- 787 **Water: Science and society**  
T. N. Narasimhan
- 794 **Water resources of India**  
Rakesh Kumar, R. D. Singh and K. D. Sharma
- 812 **Groundwater ethics for its sustainability**  
P. S. Datta
- 818 **Climate and water resources of India**  
R. Ramesh and M. G. Yadava
- 825 **Groundwater isotopic investigations in India: What has been learned?**  
S. K. Gupta and R. D. Deshpande
- 836 **Why do Gangetic rivers aggrade or degrade?**  
Rajiv Sinha
- 841 **Chemical weathering in the river basins of the Himalaya, India**  
S. Krishnaswami and Sunil K. Singh
- 850 **Biological management of water on land**  
V. Rajamani
-

---

**RESEARCH ARTICLES**

- 853 **The discovery of PSR J1833–1034: the pulsar associated with the supernova remnant G21.5–0.9**  
Y. Gupta, D. Mitra, D. A. Green and A. Acharyya
- 857 **First observations of extremely small dispersion whistlers from Bhopal ( $L \sim 0.96$ ), a low-latitude station**  
Sunil K. Singh, Lalmani, Shailendra Saini and A. K. Gwal
- 

**RESEARCH COMMUNICATIONS**

- 864 **Need of a disaster alert system for India through a network of real-time monitoring of sea-level and other meteorological events**  
Antony Joseph and R. G. Prabhudesai
- 870 **Molecular evidence for occurrence of Tuberoses mild mottle virus infecting tuberoses (*Polanthes tuberosa*) in India**  
Saurabh Kulshrestha, Arpna Mehra, Vipin Hallan, Gaurav Raikhy, Raja Ram and A. A. Zaidi
- 873 **Phytodiversity and growth form in relation to altitudinal gradient in the Central Himalayan (Kumaun) region of India**  
Geeta Kharkwal, Poonam Mehrotra, Y. S. Rawat and Y. P. S. Pangtey
- 879 **Greater sensitivity of *Hordeum himalayens* Schult. to increasing temperature causes reduction in its cultivated area**  
S. C. Joshi and L. M. S. Palni
- 882 **A computer-based identification of variable number tandem repeats in White spot syndrome virus genomes**  
Malathi Shekar, Indrani Karunasagar and I. Karunasagar
- 887 **Assessing the role of *FecB* mutation in productivity of Indian sheep**  
V. C. Pardeshi, M. N. Sainani, J. F. Maddox, P. M. Ghalsasi, C. Nimbkar and V. S. Gupta
- 

**BOOK REVIEWS**

- 891 **Earth System Analysis for Sustainability.** Hans Joachim Schellnhuber *et al.* (eds), reviewed by S. K. Tandon ■ 892 **Science in Archaeology and Archaeo-materials** by Anun Kumar Biswas (ed.), reviewed by P. Ramakoteswara Rao ■ 893 **Disaster Management** by Harsh K. Gupta (ed.), reviewed by Vinod Sharma
- 

**PERSONAL NEWS**

- 895 **Nautam Bhagwanlal Bhatt (1909–2005)**, Sriram Shastry
- 

Volume 89 Number 6

25 September 2005

---

- 914 **In this issue**
- 

**GUEST EDITORIAL**

- 915 **DBT's National Strategy for the Development of Biotechnology**  
K. Muralidhar
- 

**CORRESPONDENCE**

- 917 **Indian wisdom and aging research**, Kalluri Subba Rao ■ 917 **Spirit of bushido**, A. Rajanikanth ■ 918 **Plagiarism: A librarian's view**, S. N. Singh ■ 919 **The Valley of Flowers – A newly declared World Heritage Site**, Chandra Prakash Kala ■ 920 **Anti-diabetic effect of *Annona squamosa* (L.)**, Annie Shirwaikar; *response by* Vibha Tandon ■ 921 **A commentary on scientific integrity**, C. P. Rajendran; *response by* Sridevi Jade ■ 923 **The Bhopal gas tragedy: Evidence for cyanide poisoning not convincing**, Thomas H. Gassert and V. Ramana Dhara; *response by* S. Sriramachari
- 

**NEWS**

- 926 **Microbial diversity**, T. Satyanarayana ■ 929 **Unconventional pests**, Minakshi De
- 

**RESEARCH NEWS**

- 930 **Rice blast fungus sequenced**, Subhankar Roy-Barman and Bharat B. Chattoo ■ 932 **It's all in your colour**, Dyuti Bhattacharyya
-

## SCIENTIFIC CORRESPONDENCE

- 934 **Plant proteins in fish feed: An additional analysis**, N. Krishnankutty ■ 936 **Differential rooting and sprouting behaviour of two *Jatropha* species and associated physiological and biochemical changes**, Sunita Kochhar, V. K. Kochhar, S. P. Singh, R. S. Katiyar and P. Pushpangadan ■ 939 **The first dolphin fossil from the Miocene of Korea**, Jong-Deock Lim
- 

## GENERAL ARTICLES

- 941 **Ancient shell industry at Bet Dwarka Island**  
A. S. Gaur, Sundaresh and Vardhan Patankar
- 947 **Ernst Mayr and evolutionary biology: Polemics and synthesis**  
Renee M. Borges
- 

## REVIEW ARTICLES

- 955 ***Oryza glaberrima*: A source for the improvement of *Oryza sativa***  
N. Sarla and B. P. Mallikarjuna Swamy
- 964 **Emerging paradigms of tree phenology in dry tropics**  
K. P. Singh and C. P. Kushwaha
- 

## RESEARCH ARTICLES

- 976 **Habitat and microhabitat distribution of stream insect communities of the Western Ghats**  
K. A. Subramanian and K. G. Sivaramakrishnan
- 988 **Electrochemical behaviour of microbes on orthodontic wires**  
S. Maruthamuthu, A. Rajasekar, S. Sathiyarayanan, N. Muthukumar and N. Palaniswamy
- 

## RESEARCH COMMUNICATIONS

- 997 **A new precision improvement in zenith tropospheric delay estimation by GPS**  
S. G. Jin and P. H. Park
- 1000 **Efficient microwave-assisted hydrolysis of triolein and synthesis of bioester, bio-surfactant and glycerides using *Aspergillus carneus* lipase**  
R. K. Saxena, Jasmine Isar, Saurabh Saran, Rekha Kaushik and Winlet Sheeba Davidson
- 1004 **Assay of snake venom phospholipase A<sub>2</sub> using scattering mode of a spectrofluorimeter**  
Gargi Maity and Debasish Bhattacharyya
- 1008 **Germination improvement in *Swertia angustifolia*: a high value medicinal plant of Himalaya**  
Arvind Bhatt, R. S. Rawal and Uppeendra Dhar
- 1012 **Direct and high frequency somatic embryogenesis and plant regeneration from hypocotyls of chickpea (*Cicer arietinum* L.), a grain legume**  
G. Kiran, C. P. Kaviraj, G. Jogeswar, P. B. Kavi Kishor and Srinath Rao
- 1018 **Matting rush (*Schoenoplectus lacustris* (Linn.) Palla): Status, utility, threat, cultivation and conservation options in Manipur**  
Alka Jain, S. Roshnibala, K. Rajshree, H. Nandiram Sharma, P. B. Kanjilal and H. Birkumar Singh
- 1022 **Use of timber in shipbuilding industry: Identification and analysis of timber from shipwrecks off Goa coast, India**  
Sila Tripati, M. Sujatha, R. Vijendra Rao and K. Satyanarayana Rao
- 1027 **Combined effect of gamma radiation and Azadirachtin on the growth and development of *Spodoptera litura* (Fabricius)**  
A. K. Sharma and R. K. Seth
- 1032 **Application of lichenometry to slided materials in the Higher Himalayan landslide zone**  
Vikram Gupta
- 

## BOOK REVIEWS

- 1037 **Herbs for Good Health** by T. D. Nirmala Devi *et al.*; **Organic Cotton Cultivation**. K. Vijayalakshmi *et al.*; **Organic Paddy Cultivation**. K. Vijayalakshmi *et al.* reviewed by Rajendra Prasad ■ 1037 **Handbook of Industrial Crops** by V. L. Chopra and K. V. Peter (eds), reviewed by T. N. Ananthakrishnan
-

1062	<b>In this issue</b>
	<b>GUEST EDITORIAL</b>
1063	<b>Where have our young ones gone?: The coolieization of India</b> Gangan Prathap
	<b>CORRESPONDENCE</b>
1065	<b>Ethics and plagiarism</b> , A. S. Rao ■ <b>1065 Science funding and follow-up actions</b> , Anantanarayanan Raman ■ <b>1066 The need for NET exams</b> , Rajashekhar Patil ■ <b>1066 Reconsidering ourselves: Assessing oneself and the present educational scenario</b> , Hridip Kumar Sarma, Bibhuti Prasad Lahkar, Md. Firoz Ahmed and Bibhab Kumar Talukdar ■ <b>1067 Assessment of biodiversity loss</b> , Chandra Prakash Kala ■ <b>1068 Invariance principles and belief structures</b> , A. N. Mitra; <i>response by</i> A. S. Parasnis ■ <b>1069 Missing HN</b> , H. S. Vinay Deepak ■ <b>1069 Schirmacher Oasis, East Antarctica, a lichenologically interesting region</b> , Sanjeeva Nayaka and D. K. Upreti ■ <b>1071 Changes in local intertidal seaweed habitats in the Andaman and Nicobar Islands after 26 December 2004 tsunami</b> , Vaibhav A. Mantri ■ <b>1073 China's battle against escalating environmental pollution</b> , Govindasamy Agoramoorthy and Minna J. Hsu
	<b>RESEARCH NEWS</b>
1074	<b>Recent revisions to the geologic time scale</b> , A. V. Sankaran
	<b>COMMENTARY</b>
1076	<b>The science of growth and the growth of science</b> , Suranjana Nabar-Bhaduri and Sumit Bhaduri
	<b>SCIENTIFIC CORRESPONDENCE</b>
1080	<b>A new chromosome number in <i>Polygonatum cirrhifolium</i> Royle – an endangered liliaceous medicinal herb</b> , Surrinder K. Lattoo, Shabnam Khan and Autar K. Dhar ■ <b>1082 Sethusamudram Ship Canal Project: oceanographic/geological and ecological impact on marine life in the Gulf of Mannar and Palk Bay, southeastern coast of India</b> , P. K. Kathal ■ <b>1083 Imprint of 26 December 2004 Sumatra earthquake in aquifers of Hyderabad granite pluton</b> , D. Muralidharan, Rolland Andrade, G. Laxminarayana, T. Swathi and T. Swetha ■ <b>1086 Swarm cells of slime molds in sexual conjugation from sixty-five million year old sediments, Madhya Pradesh, India</b> , R. K. Kar, Neeta Sharma and Ratan Kar ■ <b>1089 Soft body impression of the hand in <i>Archaeopteryx</i></b> , Larry D. Martin and Jong-Deock Lim ■ <b>1090 Green mussel <i>Perna viridis</i>, a new host for the pea crab <i>Pinnotheres placunae</i> along the Malabar coast, Kerala</b> , Bobby Jose and T. R. Deepthi
	<b>GENERAL ARTICLES</b>
1092	<b>Apomixis research in India: past efforts and future strategies</b> P. Kaushal, S. N. Zadoo, D. R. Malaviya and A. K. Roy
1097	<b>Establishment of artemisinin combination therapy as first line treatment for combating malaria: <i>Artemisia annua</i> cultivation in India needed for providing sustainable supply chain of artemisinin</b> Sushil Kumar and Suchi Srivastava
	<b>REVIEW ARTICLES</b>
1103	<b>Phospholipid fatty acid – A bioindicator of environment monitoring and assessment in soil ecosystem</b> Amrit Kaur, A. Chaudhary, Amarjeet Kaur, R. Choudhary and R. Kaushik
1113	<b>Reactive oxygen species and oxidative burst: Roles in stress, senescence and signal transduction in plants</b> Soumen Bhattacharjee
	<b>SPECIAL SECTION: ANIMAL BEHAVIOUR</b>
1122	<b>The animal mind and conservation of species: Knowing what animals know</b> Douglas K. Candland
1128	<b>Behaviour genetics in the post-genomics era: From genes to behaviour and vice versa</b> Amitabh Joshi
1136	<b>Zeitgebers (<i>time cues</i>) for biological clocks</b> Vijay Kumar Sharma and M. K. Chandrashekar

- 1147 **Neurobiology and behaviour: A network of connections**  
Rohini Balakrishnan
- 1166 **Ecology proposes, behaviour disposes: Ecological variability in social organization and male behavioural strategies among wild bonnet macaques**  
Anindya Sinha, Kakoli Mukhopadhyay, Anirban Datta-Roy and Sunita Ram
- 1180 **Integrating proximate and ultimate causation: Just one more go!**  
B. Thierry
- 1184 **Role of parasites and commensals in shaping host behaviour**  
Maithili Jog and Milind Watve
- 1192 **Variation in male mating behaviour within ungulate populations: patterns and processes**  
Kavita Isvaran
- 1200 **Social and reproductive behaviour in elephants**  
T. N. C. Vidya and R. Sukumar
- 1208 **Midnight's children?: Solitary primates and gregarious chiropterans**  
Sindhu Radhakrishna
- 1214 **Managing primates in zoos: Lessons from animal behaviour**  
Avanti Mallapur
- 1220 **Mate choice and its implications for conservation and management**  
Suhel Quader
- 1230 **Behavioural studies: A necessity for wildlife management**  
Mewa Singh and Werner Kaumanns

---

**RESEARCH ARTICLE**

- 1237 **Near-field observations on the co-seismic deformation associated with the 26 December 2004 Andaman–Sumatra earthquake**  
Anil Earnest, C. P. Rajendran, Kusala Rajendran, R. Anu, G. M. Arun and P. M. Mohan

---

**RESEARCH COMMUNICATIONS**

- 1245 **Modelling of foF<sub>2</sub> using neural networks at an equatorial anomaly station**  
A. D. Sarma and T. Madhu
- 1248 **Application of bacterial biomass as a potential metal indicator**  
S. Srivastava, P. Singh, R. Bhagat and V. N. Tripathi
- 1252 **Determination of nutritive value and analysis of mineral elements for some medicinally valued plants from Uttaranchal**  
A. K. Indrayan, Sudeep Sharma, Deepak Durgapal, Neeraj Kumar and Manoj Kumar
- 1256 **Ratio of stable carbon and oxygen isotope discrimination ( $\Delta^{13}\text{C}/\Delta^{18}\text{O}$ ) reflects variability in leaf intrinsic carboxylation efficiency in plants**  
H. Bindumadhava, M. S. Sheshshayee, G. Shashidhar, T. G. Prasad and M. Udayakumar
- 1259 **Occurrence of magnetic spherules in the Maastrichtian bone bed sedimentary sequence of Fatehgarh Formation, Barmer basin, India**  
S. C. Mathur, S. D. Gaur, R. S. Loyal, Amita Tripathi, R. P. Tripathi and Ajay Gupta
- 1268 **Biosafety concerns on the use of *Photorhabdus luminescens* as biopesticide: experimental evidence of mortality in egg parasitoid *Trichogramma* spp.**  
Sharad Mohan and Naved Sabir

---

**BOOK REVIEWS**

- 1273 **Photosynthesis. Regulation Under Varying Light Regimes** by V. S. Rama Das, *reviewed by* A. S. Raghavendra ■ 1273 **Microbial Genomes.** C. M. Fraser *et al.*, *reviewed by* Shilpi Mittal and J. S. Virdi

---

**PERSONAL NEWS**

- 1276 **Leela Mulherkar-Golay (1915–2005)**, Surendra Ghaskadbi and Sohan P. Modak ■ 1277 **Ranjan Roy Daniel (1923–2005)**, S. A. Stephens

---

**HISTORICAL NOTES**

- 1280 **The first image of the atoms and role of an Indian scientist**, Deepak Kumar
-

## 1302 In this issue

## GUEST EDITORIAL

- 1303 Deemed Universities and other Universities  
S. C. Lakhota

## CORRESPONDENCE

- 1305 Merit must be promoted, Anil Kumar Dwivedi ■ 1305 Institutional learning and change for universities and national laboratories, Sunita Sangar ■ 1306 Socially oriented medicine: teaching costs and outcomes, V. Sitaramam ■ 1307 Scope for formulating quality standards of food grade silver, Mukul Das and S. K. Khanna ■ 1307 Life sciences research in India, J. S. Virdi ■ 1308 Need for legislative impediments to avoid mass harvesting of bryoflora, Anuj Saxena and D. K. Saxena ■ 1309 Is Gulf of Mannar heading for marine bioinvasion?, Neelam Pereira and X. N. Verlecar ■ 1310 Teira batfish, *Platax teira* (Forsskal, 1775) in Pudhumadam coastal waters, drifted due to the tsunami of 26 December 2004, N. Marimuthu, J. Jerald Wilson and A. K. Kumaraguru ■ 1312 Structure and tectonics of Kutch basin and earthquakes, A. B. Roy; response by S. K. Biswas

## NEWS

- 1314 Advancing frontiers of molecular genetics: Where does India stand, H. K. Jain and R. P. Sharma

## RESEARCH NEWS

- 1316 Population genomic and bioinformatic studies reveal evolutionary history of *Drosophila ananassae*, Aparup Das

## SCIENTIFIC CORRESPONDENCE

- 1322 A PCR-RFLP tool for differentiating *Helicoverpa armigera* and *H. assulta* (Lepidoptera, Noctuidae), S. Kranthi, K. R. Kranthi, A. A. Bharose and S. N. Syed ■ 1323 Regeneration of plants from root explant of two Indian cultivars of *Brassica campestris* L. through somatic embryogenesis, Soma Paul and S. R. Sikdar ■ 1326 A new species of day gecko (Squamata, Gekkonidae, *Cnemaspis*) from the Anaikatti Hills, Western Ghats, Tamil Nadu, India, Debanik Mukherjee, S. Bhupathy and A. M. A. Nixon ■ 1328 First record of an exceptionally diverse and well preserved amber-embedded biota from Lower Eocene (~52 Ma) lignites, Vastan, Gujarat, Habib Alimohammadian, Ashok Sahni, Rajeev Patnaik, Rajinder Singh Rana and Hukam Singh

## GENERAL ARTICLES

- 1331 Health traditions of Buddhist community and role of *amchis* in trans-Himalayan region of India  
Chandra Prakash Kala
- 1339 Science plan for coastal hazard preparedness  
K. S. Krishna

## REVIEW ARTICLES

- 1348 Ethylene receptors and molecular mechanism of ethylene sensitivity in plants  
Ajay Arora
- 1362 Interfacing geographical information systems and pesticide models  
Chitra Sood and R. M. Bhagat

## RESEARCH ARTICLE

- 1371 Use of anchored (AG)<sub>n</sub> and (GA)<sub>n</sub> primers to assess genetic diversity of Indian landraces and varieties of rice  
N. Sarla, C. N. Neeraja and E. A. Siddiq

## RESEARCH COMMUNICATIONS

- 1382 Triple burden on women in science: A cross-cultural analysis  
Namrata Gupta, Carol Kemelgor, Stefan Fuchs and Henry Etkowitz
- 1386 Salt stress effects on the accumulation of vacuolar H<sup>+</sup>-ATPase subunit c transcripts in wild rice, *Porteresia coarctata* (Roxb.) Tateoka  
P. Senthilkumar, M. N. Jithesh, M. Parani, S. Rajalakshmi, K. Praseetha and Ajay Parida
- 1394 Differential expression of tomato ACC oxidase gene family in relation to fruit ripening

K. N. Anjanasree, Praveen Kumar Verma and K. C. Bansal

- 1399 **Anomalous fluctuation of radon, gamma dose and helium emanating from a thermal spring prior to an earthquake**  
Nisith K. Das, Rakesh K. Bhandari, Debasis Ghose, Prasanta Sen and Bikash Sinha
- 1404 **Relocation of earthquakes in the Northeast Indian region using joint hypocentre determination method**  
Pankaj Mala Bhattacharya, Jose Pujol, R. K. Majumdar and J. R. Kayal
- 1414 **Delineation and monitoring of aquaculture areas using multi-temporal space-borne multispectral data**  
R. S. Dwivedi and Sreenivas Kandrika
- 1421 **Variations in terrigenous sediment discharge in a sediment core from southeastern Arabian Sea during the last 140 ka**  
J. N. Pattan, Toshiyuki Masuzawa and Mineko Yamamoto

---

**BOOK REVIEWS**

- 1426 **The New Energy Economy** by G. M. Pillai (ed.), *reviewed by* C. L. Gupta ■ 1426 **Agricultural Sustainability: Strategies for Assessment** by Gary W. van Loon, S. G. Patil and L. B. Hugar, *reviewed by* I. P. Abrol

---

**PERSONAL NEWS**

- 1429 **G. Ranganaswami (1925–2005)**, N. S. Subba Rao
- 

Volume 89 Number 9

10 November 2005

---

- 1450 **In this issue**

---

**GUEST EDITORIAL**

- 1451 **Asymmetry between Arts and Science**  
K. N. Ganeshaiyah

---

**CORRESPONDENCE**

- 1453 **Professionals and innovators**, Samir Bhattacharya ■ 1453 **Copying the US system!**, Suresh Chandra Tiwari ■ 1454 **Applied cognitive neuroscience: Pitfalls of funding an ideology**, Garga Chatterjee ■ 1454 **IndCollections: biological specimens in Indian collections**, Vishwas Chavan, N. S. Rane, H. V. Ghate and S. Krishnan ■ 1455 **Astrophysical inaccuracies**, D. C. V. Mallik; *response by* Sreeram Chaulia

---

**NEWS**

- 1457 **The Einstein exposition in Bern**, A. Rajaram ■ 1458 **Accelerators and radiation physics research**, Minakshi De ■ 1459 **Six months after the tsunami**, R. Narasimha, Sangeetha Menon, Papiya Bhattacharya and M. B. Rajani ■ 1461 **Bird and environment**, Vinaya Kumar Sethi, Michele Loneux and Dinesh Bhatt

---

**RESEARCH NEWS**

- 1463 **Radiation from mini bang**, Sanjay K. Ghosh

---

**OPINION**

- 1464 **The Indian earthquake problem**, Sudhir K. Jain

---

**COMMENTARY**

- 1467 **Can India produce enough wheat even by 2020?**, S. Nagarajan

---

**SCIENTIFIC CORRESPONDENCE**

- 1472 **Red tide of *Noctiluca miliaris* off south of Thiruvananthapuram subsequent to the 'stench event' at the southern Kerala coast**, Satish Sahayak, R. Jyothibabu, K. J. Jayalakshmi, H. Habeebrehman, P. Sabu, M. P. Prabhakaran, P. Jasmine, P. Shaiju, G. Rejomon, J. Thresiamma and K. K. C. Nair ■ 1474 **An improvised vegetative propagation technique for self-incompatible bamboos**, K. C. Koshy and B. Gopakumar

---

**GENERAL ARTICLES**

- 1477 **An approach via behavioural pragmatics to the contrastive study of 'language' as available to humans and to nonhuman primates**  
R. Narasimhan

- 1481 **Commercial viability of cultivation of an endangered medicinal herb *Nardostachys jatamansi* at three different agroclimatic zones**  
R. S. Chauhan and M. C. Nautiyal
- 

**REVIEW ARTICLE**

- 1489 **Secondary metabolites of *Chrysanthemum* genus and their biological activities**  
Ajai Kumar, S. P. Singh and R. S. Bhakuni
- 

**SPECIAL SECTION: 50 YEARS OF CITATION INDEXING**

- 1502 **Early impressions of citation indexing**  
Joshua Lederberg
- 1503 **'Citation Indexes for Science' – A 50 year citation history**  
Olle Persson
- 1505 **A hundred million acts of whimsy?**  
Blaise Cronin
- 1510 **Evaluation of research and evolution of science indicators**  
Loet Leydesdorff
- 1518 **Citation and hyperlink networks**  
Andrea Scharnhorst and Mike Thelwall
- 1524 **Beyond *SCI* citations – New ways to evaluate research**  
Grant Lewison
- 1531 **The emergence of competitors to the *Science Citation Index* and the *Web of Science***  
Dana L. Roth
- 1537 **As we may search – Comparison of major features of the *Web of Science*, *Scopus*, and *Google Scholar* citation-based and citation-enhanced databases**  
Peter Jacso
- 1548 **Counting the gatekeepers of international science journals a worthwhile science indicator**  
Tibor Braun and Ildikó Dióspatonyi
- 1552 **Mapping the global structure of Antarctic research *vis-à-vis* Antarctic Treaty System**  
Prabir G. Dastidar and Olle Persson
- 

**RESEARCH ARTICLES**

- 1555 **Simulations of the Indian summer monsoon with a coupled ocean–atmosphere model on PARAM Padma**  
S. Janakiraman, Ravi S. Nanjundiah and P. N. Vinayachandran
- 1563 **Plasmodium-infected red blood cells exhibit enhanced rolling independent of host cells and alter flow of uninfected red cells**  
S. Roy, J. A. Dharmadhikari, A. K. Dharmadhikari, Deepak Mathur and Shobhona Sharma
- 1571 **Human acute lymphoblastic leukaemia cells make human pregnancy hormone hCG and expose it on the membrane: A case for using recombinant antibody against hCG for selective delivery of drugs and/or radiations**  
Rafi Shiraz Kabeer, Rahul Pal and G. P. Talwar
- 1577 **Analysis of *b*-value and improved *b*-value of acoustic emissions accompanying rock fracture**  
M. V. M. S. Rao and K. J. Prasanna Lakshmi
- 

**RESEARCH COMMUNICATIONS**

- 1583 **Solar control of southwest monsoon on centennial timescales**  
M. Tiwari, R. Ramesh, B. L. K. Somayajulu, A. J. T. Jull and G. S. Burr
- 1588 **Presence/role of twin gyres in the El Nino 3.4 domain**  
P. Rahul Chand Reddy and P. S. Salvekar
- 1592 **Phosphate deficiency suppresses expression of light-regulated *psbO* and *psbP* genes encoding extrinsic proteins of oxygen-evolving complex of PSII**  
Ajay Jain, A. Cao, A. S. Karthikeyan, J. C. Baldwin and K. G. Raghothama
- 1596 **Citrus yellow mosaic virus is associated with mosaic disease in Rangpur lime rootstock of citrus**  
V. K. Baranwal, Jitender Singh, Y. S. Ahlawat, K. Gopal and M. U. Charaya
- 1600 **Modelling for pollutant migration in the tannery belt, Dindigul, Tamil Nadu, India**  
N. C. Mondal and V. S. Singh

- 1606 Lower vertebrates from the Late Palaeocene–Earliest Eocene Akli Formation, Giral Lignite Mine, Barmer District, western India  
R. S. Rana, K. Kumar, H. Singh and K. D. Rose
- 1613 Antibacterial proteins from non-mulberry silkworms against flacherie causing *Pseudomonas aeruginosa* AC-3  
Jyotsna Sharma, Archana Yadav, B. G. Unni and M. C. Kalita
- 1619 Prevalence of white spot syndrome virus and monodon baculovirus in *Penaeus monodon* broodstock and postlarvae from hatcheries in southeast coast of India  
A. Uma, A. Koteeswaran, Karunasagar Indrani and Karunasagar Iddya

---

#### BOOK REVIEWS

- 1623 One Hundred Reasons to be a Scientist by K. R. Sreenivasan (ed.), reviewed by Mustansir Barma ■ 1624 Chlorophyll *a* Fluorescence: A Signature of Photosynthesis by George C. Papageorgiou and Govindjee (eds), reviewed by Swapan K. Bhattacharjee
- 

Volume 89 Number 10

25 November 2005

---

#### 1642 In this issue

---

#### EDITORIAL

- 1643 Open Source Software: The Silent Revolution  
N. V. Joshi
- 

#### CORRESPONDENCE

- 1645 IT and coolieization, Nikhil Kumar; M. Vidyasagar ■ 1646 Impact of tsunami on meiofauna of Marina Beach, Chennai, India, K. K. Satpathy; Response by K. Altaff ■ 1647 Does homeopathic treatment work?, Y. P. Joshi ■ 1647 Can Habur limestone curdle milk? – a myth or reality, B. S. Paliwal ■ 1649 Clinical trials in India, A. S. Rao
- 

#### NEWS

- 1649 Asthmatic and allergic disorders mitigation mission, Minakshi De ■ 1650 Viable but non-culturable bacteria: their impact on public health, Yogita N. Sardesai ■ 1651 The 2005 Nobel Prize in Physiology or Medicine: *Helicobacter pylori* and its role in gastritis and peptic ulcer disease, P. K. Gupta ■ 1655 Rapidly quenched and metastable materials, N. K. Mukhopadhyay ■ 1658 ACS National Meeting and Expositions, Okram Mukherjee Singh ■ 1659 The great plume debate, Hetu C. Sheth and Sarajit Sensarma ■ 1661 Evidence-based and integrated medicine for lymphatic filariasis, other chronic dermatoses and HIV/AIDS, Minakshi De
- 

#### RESEARCH NEWS

- 1662 Avian brain nomenclature change, Monika Sadananda
- 

#### SCIENTIFIC CORRESPONDENCE

- 1665 Does *Iris sikkimensis* Dykes occur in India?, D. D. Bahali ■ 1666 Fishmeal extract agar – a medium to inhibit swarming of *Proteus* spp., K. Subbannayya and J. Udayalaxmi ■ 1668 Problems in microwave digestion of high-Si and high-Al rocks, Kamal L. Pruseth, Sudesh Yadav, Pankaj Mehta, Deepika Pandey and Jayant K. Tripathi
- 

#### GENERAL ARTICLES

- 1672 On the English edition of Van Rheedee's *Hortus Malabaricus* by K. S. Manilal (2003)  
H. Y. Mohan Ram
- 1681 Engineering lessons not learnt from 2002 Diglipur earthquake – A review after 2004 Sumatra earthquake  
Durgesh C. Rai and C. V. R. Murty
- 

#### REVIEW ARTICLES

- 1690 Investigation of sequence processing: A cognitive and computational neuroscience perspective  
Raju S. Bapi, V. S. Chandrasekhar Pammi, K. P. Miyapuram and Ahmed
- 1699 Molecular methods for research on arbuscular mycorrhizal fungi in India: problems and prospects  
S. Ram Reddy, Pavan K. Pindi and S. M. Reddy
-

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**RESEARCH ARTICLES**

- 1710 **Non-Förster distance and orientation dependence of energy transfer and applications of fluorescence resonance energy transfer to polymers and nanoparticles: How accurate is the spectroscopic ruler with  $1/R^6$  rule?**  
Harjinder Singh and Biman Bagchi
- 1720 **Mixed convection in a lid-driven cavity: Appearance of bifurcation, periodicity and hysteresis**  
M. D. Deshpande and B. G. Srinidhi
- 1729 **Impact of the tsunami of 26 December 2004 on the coral reef environment of Gulf of Mannar and Palk Bay in the southeast coast of India**  
A. K. Kumaraguru, K. Jayakumar, J. Jerald Wilson and C. M. Ramakritinan
- 

**RESEARCH COMMUNICATIONS**

- 1742 **Calcite growth in *Cissus quadrangularis* plant extract, a traditional Indian bone-healing aid**  
Ambarish Sanyal, Absar Ahmad and Murali Sastry
- 1745 **Molecular characterization of *Humicola grisea* isolates associated with *Agaricus bisporus* compost**  
S. K. Singh, B. Vijay, Vishal Mediratta, O. P. Ahlawat and Shwet Kamal
- 1749 **Distribution, abundance and vertical migration pattern of krill – *Euphausia superba* Dana at fishing area 58 of the Indian Ocean sector of Southern Ocean**  
Vijayakumar Rathod
- 1754 **Bathymetry prediction model from high-resolution satellite gravity as applied over a part of the eastern Indian offshore**  
T. J. Majumdar and R. Bhattacharyya
- 1759 **Reverse transcription polymerase chain reaction-based detection of *Arabis mosaic virus* and *Strawberry latent ringspot virus* in vector nematodes**  
S. Kulshrestha, V. Hallan, G. Raikhy, O. K. Adekunle, N. Verma, Q. M. R. Haq and A. A. Zaidi
- 

**BOOK REVIEWS**

- 1763 **Annual Review of Entomology Vol. 50, 2005** by May R. Berenbaum *et al.* (eds), reviewed by J. Nagaraju ■ 1765 **Himalayan Orogen–Foreland Interaction** by A. R. Bhattacharya and K. K. Agarwal (eds), reviewed by G. J. Chakrapani
- 

**PERSONAL NEWS**

- 1767 **Hermann Bondi (1919–2005)**, Jayant V. Narlikar
- 

Volume 89 Number 11

10 December 2005

- 
- 1777 **In this issue**
- 

**GUEST EDITORIAL**

- 1779 **Earthquake prediction: a game of chance?**  
Kusala Rajendran
- 

**CORRESPONDENCE**

- 1781 **Natural calamities and pseudoscientific menace**, Ravinder Banyal and A. J. Saigeetha ■ 1782 **Health custodians**, K. Krishna Murthy ■ 1782 **Impact factor: Is it dragging science off course?**, Arun K. Shanker and Chitra Shanker ■ 1783 **Volcanic ash beds**, L. N. Gupta and Naresh Kochhar; *response by* S. J. Sangode ■ 1785 **Earthquake at Koyna**, Arun Bapat; *response by* Harsh Gupta *et al.*
- 

**NEWS**

- 1788 **Nobel Prize for green chemistry: Stance for a future**, Poovathinthodiyil Raveendran ■ 1790 **Energy security to energy independence**, Shailendra Tripathi and L. D. Sharma ■ 1791 **EZACBICON**, Minakshi De
- 

**RESEARCH NEWS**

- 1792 **Natural radioactivity: Extant and extinct**, K. Gopalan
- 

**SCIENTIFIC CORRESPONDENCE**

- 1795 **Diu island: A paradise for tourists and seaweed biologists**, Vaibhav A. Mantri and P. V. Subba Rao ■ 1797 **A new *Orontobryum* Mitt. ex Fleisch. from Darjeeling, eastern Himalayas**, Virendra Nath, A. K. Asthana and Vinay Sahu
-

---

**GENERAL ARTICLE**

- 1800 **Mangrove stands of Andamans *vis-à-vis* tsunami**  
S. Dam Roy and P. Krishnan
- 

**REVIEW ARTICLES**

- 1805 **Enhanced capabilities of IRS P6 LISS IV sensor for urban mapping**  
Kshama Gupta and Sadhana Jain
- 1813 **Why hybrid males are sterile in *Drosophila*?**  
Paras K. Mishra and Bashisth N. Singh
- 

**SPECIAL SECTION: EMBRYOLOGY OF FLOWERING PLANTS**

- 1820 **Contributions of Panchanan Maheshwari's school to angiosperm embryology through an integrative approach**  
K. R. Shivanna and H. Y. Mohan Ram
- 1835 **Specification and maintenance of the floral meristem: interactions between positively-acting promoters of flowering and negative regulators**  
Usha Vijayraghavan, Kalika Prasad and Elliot Meyerowitz
- 1844 **The angiosperm female gametophyte: No longer the forgotten generation**  
Vladimir Brukhin, Mark D. Curtis and Ueli Grossniklaus
- 1853 **Pollen cytoskeleton during germination and tube growth**  
Giampiero Cai, Cecilia Del Casino, Silvia Romagnoli and Mauro Cresti
- 1861 ***In vitro* fertilization – a tool to dissect cell specification from a higher plant zygote**  
Takashi Okamoto and Erhard Kranz
- 1870 **Androgenic haploids: Factors controlling development and its application in crop improvement**  
Swapan K. Datta
- 1879 **Apomixis: An enigma with potential applications**  
V. Bhat, K. K. Dwivedi, J. P. Khurana and S. K. Sopory
- 

**RESEARCH ARTICLES**

- 1894 **Generation of phase-conjugate wave in acid blue 7 dye-doped gelatin film**  
T. Geethakrishnan and P. K. Palanisamy
- 1899 **Synthesis, structure and magnetic properties of a new one-dimensional iron phosphite, [Fe<sup>III</sup>(1,10-phenanthroline)(HPO<sub>3</sub>)(H<sub>2</sub>PO<sub>3</sub>)]**  
Sukhendu Mandal, Mark A. Green and Srinivasan Natarajan
- 1904 **Modelling of methane emissions from rice-based production systems in India with the denitrification and decomposition model: Field validation and sensitivity analysis**  
Y. Jagadeesh Babu, C. Li, S. Froking, D. R. Nayak, A. Datta and T. K. Adhya
- 

**RESEARCH COMMUNICATIONS**

- 1913 **Direct and indirect arsenic release from soaps by unhygienic use in tubewells**  
Soumen Dey, Shahana Chatterjee and Sabyasachi Sarkar
- 1917 **Signature of increasing total column water vapour and surface temperature at Maitri, Antarctica**  
S. L. Jain, Sachin D. Ghude, B. C. Arya, Ashok Kumar and M. M. Bajaj
- 1922 **Variations in hosting beneficial plant-associated microorganisms by root (wilt)-diseased and field-tolerant coconut palms of West Coast Tall variety**  
Murali Gopal, Alka Gupta and R. V. Nair
- 1927 **IWAVE: an ocean simulation model for internal waves**  
G. V. Krishna Kumar and P. Balasubramanian
- 1932 **Three-phase tectonic evolution of the Andaman backarc basin**  
K. A. Kamesh Raju
- 1937 **Whole-earth decompression dynamics**  
J. Marvin Herndon
- 1941 **Climato-tectonic impression on Trans Himalayan lakes: A case study of Kyun Tso basin of the Indus Suture Zone in NW Himalaya using remote sensing techniques**  
G. Philip and John Mathew

- 1947 **A record of foraminiferal assemblage in tsunami sediments along Nagappattinam coast, Tamil Nadu**  
R. Nagendra, B. V. Kamalak Kannan, C. Sajith, Gargi Sen, A. N. Reddy and S. Srinivasalu

---

**BOOK REVIEWS**

- 1953 **The Story of Asia's Lions** by Divyabhanusinh, *reviewed by* T. R. Shankar Raman ■ **1955 Physiological and Ecological Adaptations to Feeding in Vertebrates** by J. Matthaias Starck and Tobias Wang (eds), *reviewed by* S. K. Saidapur

---

**PERSONAL NEWS**

- 1956 **John Norris Bahcall (1934–2005)**, Sarbani Basu
- 

- 1971 **In this issue**

---

**GUEST EDITORIAL**

- 1973 **A Celebration of Albert Einstein**  
N. Mukunda

---

**CORRESPONDENCE**

- 1975 **Coolieization of India**, V. Siddhartha ■ **1975 Back to basics**, Sunita Jacob ■ **1975 Corchorus pseudo-olitorius Islam & Zaid: wrong interpretation of the original paper and misquotation of the authors**, Ahmad S. Islam; *response by* Vatsavaya S. Raju ■ **1977 Structure and tectonics of Kutch basin and earthquakes**, A. B. Roy

---

**NEWS**

- 1978 **Experimental physics** ■ **1979 Towards developing a better appreciation of the seismicity and tectonics of Andaman and Nicobar subduction zone**, C. P. Rajendran and P. M. Mohan

---

**SCIENTIFIC CORRESPONDENCE**

- 1981 **Hypericin accumulation in glands of *Hypericum perforatum* Linn.**, R. Raina, Joginder Singh, Romesh Chand and Yashpal Sharma ■ **1982 Identifying the dietary source of polyphagous *Helicoverpa armigera* (Hübner) using carbon isotope signatures**, T. Ambika, M. S. Sheshshayee, C. A. Viraktamath and M. Udayakumar

---

**GENERAL ARTICLES**

- 1985 **Contributions and contradictions of Einstein – synthesis of knowledge of the West with wisdom of the East**  
Sudhish Chandra Banerjee
- 1990 **Citation analysis of scientific journals and journal impact measures**  
Henk F. Moed

---

**REVIEW ARTICLES**

- 1997 **Counting birds in India: Methodologies and trends**  
A. J. Urfi, Monalisa Sen, A. Kalam and T. Meganathan
- 2004 **Codal provisions of seismic hazard in Northeast India**  
Sandip Das, Vinay K. Gupta and Ishwer D. Gupta

---

**RESEARCH ARTICLES**

- 2009 **On Einstein's resolution of the twin clock paradox**  
C. S. Unnikrishnan
- 2016 **EPR spectroscopic characteristics of quartz from tungsten-mineralized and tungsten-free quartz veins in Sewariya–Govindgarh area, Rajasthan, India**  
U. Dhanya, M. S. Pandian, C. Shiyamala, R. Sivasubramaniam, D. Ponraju and P. Sambasiva Rao
- 2022 **Performance evaluation of ANN and geomorphology-based models for runoff and sediment yield prediction for a Canadian watershed**  
A. Sarangi, C. A. Madramootoo, P. Enright, S. O. Prasher and R. M. Patel

---

**SPECIAL SECTION: THE LEGACY OF ALBERT EINSTEIN**

- 2035 **Einstein and the search for unification**  
David Gross

- 2041 **Einstein and geometry**  
Michael Atiyah
- 2045 **String theory and Einstein's dream**  
Ashoke Sen
- 2054 **Black hole entropy in string theory – A window into the quantum structure of gravity**  
Atish Dabholkar
- 2064 **The winding road to quantum gravity**  
Abhay Ashtekar
- 2076 **Brownian functionals in Physics and Computer Science**  
Satya N. Majumdar
- 2093 **Bose–Einstein condensation: Where many become one and so there is plenty of room at the bottom**  
N. Kumar
- 2101 **Einstein and the quantum**  
Virendra Singh
- 2114 **Einstein's legacy: Relativistic cosmology**  
Jayant V. Narlikar
- 2120 **Einstein's universe: The challenge of dark energy**  
Subir Sarkar
- 2129 **Gravitational radiation – In celebration of Einstein's *Annus Mirabilis***  
B. S. Sathyaprakash
- 2141 **Albert Einstein: Radical pacifist and democrat**  
T. Jayaraman

---

#### RESEARCH COMMUNICATIONS

- 2147 **Estimation of crystallinity in flyash-based zeolite-A using XRD and IR spectroscopy**  
S. S. Rayalu, J. S. Udhoji, S. U. Meshram, R. R. Naidu and S. Devotta
- 2151 **Cold-tolerant fluorescent *Pseudomonas* isolates from Garhwal Himalayas as potential plant growth promoting and biocontrol agents in pea**  
Yogesh Kumar Negi, S. K. Garg and J. Kumar
- 2156 **Histochemical and biochemical studies of parasite–host interaction of *Cassytha filiformis* Linn. and *Zizyphus jujuba* Lamk.**  
M. N. Abubacker, M. Prince and Y. Hariharan
- 2159 **Long-term lowland rice and arable cropping effects on carbon and nitrogen status of some semi-arid tropical soils**  
K. L. Sahrawat, T. Bhattacharyya, S. P. Wani, P. Chandran, S. K. Ray, D. K. Pal and K. V. Padmaja
- 2163 **Water quality variations as linked to landuse pattern: A case study in Chalakudy river basin, Kerala**  
Srikumar Chattopadhyay, L. Asa Rani and P. V. Sangeetha

---

#### Erratum

- 2169 **Avian brain nomenclature change, Monika Sadananda [*Curr. Sci.*, 2005, **89**, 1662–1664]**

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#### BOOK REVIEWS

- 2170 **Duelling Idiots and Other Probability Puzzlers** by Paul J. Nahin, *reviewed by* Sudhir Pandit  
 ■ 2170 **Measuring Biological Diversity** by Anne E. Magurran, *reviewed by* Krushnamegh Kunte  
 ■ 2171 **Citation Analysis in Research Evaluation** by Henk F. Moed, *reviewed by* Subbiah Arunachalam  
 ■ 2172 **It's About Time – Understanding Einstein's Relativity** by N. David Mermin, *reviewed by* C. V. Vishveshwara

---

#### HISTORICAL NOTES

- 2174 **Folklore and Astronomy: Agastya a sage and a star**, K. D. Abhyankar

---

#### 2184 Institutional Members

---

#### 2187 Acknowledgements

---

#### 2190 Author Index

---

#### 2199 Keyword Index

---