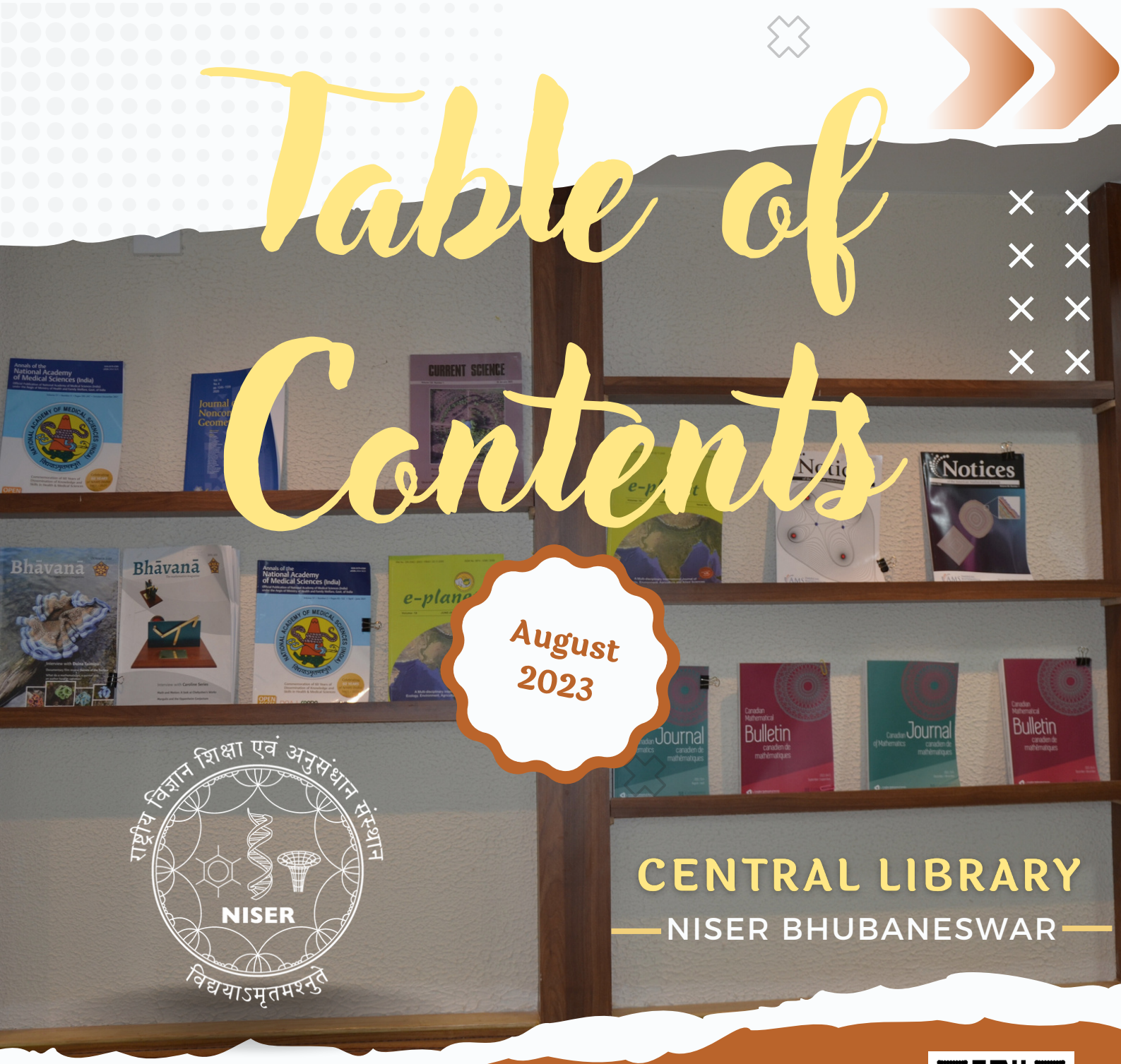
Table of Contents



August 2023

राष्ट्रीय विज्ञान शिक्षा एवं अनुसंधान संस्थान
NISER
विद्ययाऽमृतमश्नुते

CENTRAL LIBRARY
NISER BHUBANESWAR

01 Where are these Periodicals?
The Periodical section is located on the **1st Floor.**

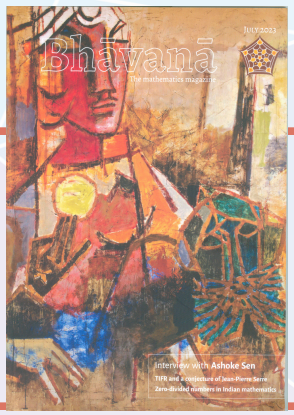
02 What resources are included here?
The Print journals & Magazines subscribed by the library are listed here.

03 How to suggest a Periodical?
Send us an email to libniser@niser.ac.in/kkgupta@niser.ac.in through proper channel

Library Website

libniser@niser.ac.in | www.niser.ac.in/library | +91-674-2494171

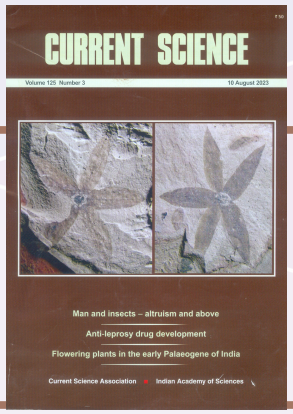
TABLE OF PERIODICALS



01

Bhavana

July-2023, Vol. 7, Issue 3



01

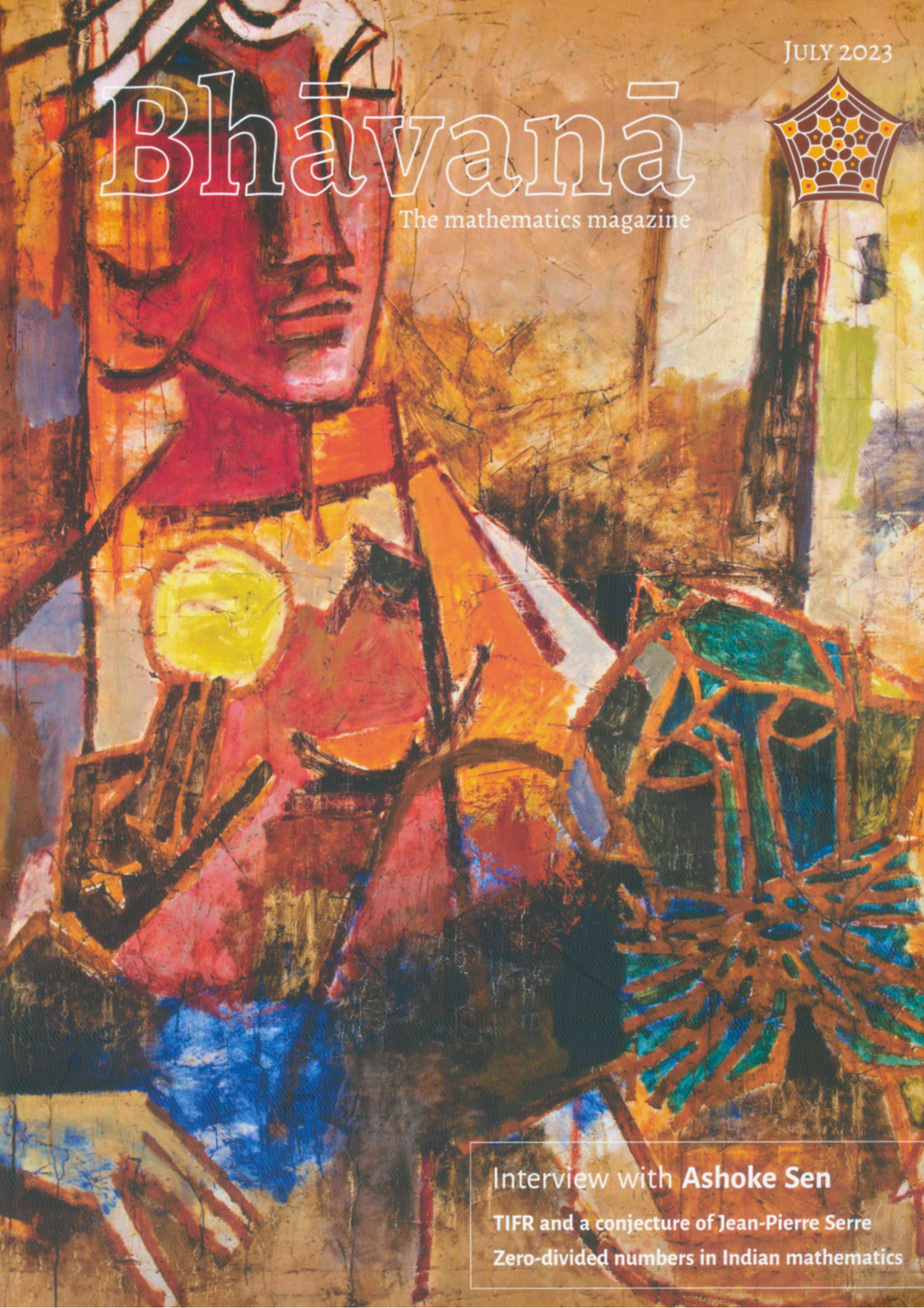
Current Science

August-2023, Vol. 125, Number 3

JULY 2023

Bhāvanā

The mathematics magazine



Interview with **Ashoke Sen**

TIFR and a conjecture of Jean-Pierre Serre

Zero-divided numbers in Indian mathematics

NISER Library
Bhubaneswar-5
Dt. 07:08:2023

Bhāvanā

VOLUME 7 · ISSUE 3 · http://bhavana.org.in

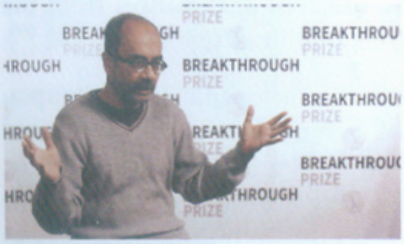
Jul 2023

TEAM *BHĀVANĀ* **5** Stringing theories together
Ashoke Sen in conversation with team *Bhāvanā*

DILEEP JATKAR **22** Ashoke Sen and S-Duality
Winner of the Fundamental Physics Prize

CHANDRASHEKHAR KHARE **28** TIFR and a conjecture of Jean-Pierre Serre

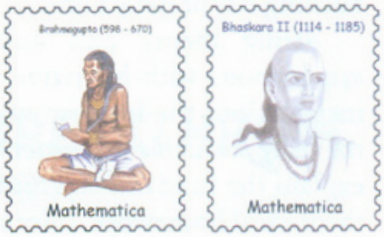
AMARTYA KUMAR DUTTA **35** Mathematics in India
Part 7: Zero-Divided Numbers in Indian Mathematics



5

22

28



35

CHIEF EDITOR C.S. Aravinda (TIFR-CAM, Bengaluru)

CONTRIBUTING EDITORS
Nithyanand Rao, Vishaka Datta
Sudhir Rao, Ashutosh Simha
Suraj Krishna M S, Vishesh Bhat

MANAGING EDITOR Rajesh Akkihal
SOCIAL MEDIA EDITOR Anupam Ghosh
ILLUSTRATIONS EDITOR Sumitra Satyavolu
PRODUCTION EDITOR Ambika Vanchinathan

CORRESPONDING EDITORS
Michael Barany (University of Edinburgh)
Mohan Delampady (ISI, Bengaluru)
Rohini Godbole (IISc, Bengaluru)
Vijay M. Patankar (BITS-Pilani, Goa)
P. Rajendran (Former Senior Editor, India Abroad)
K. Ramasubramanian (IIT Bombay, Mumbai)
Indranath Sengupta (IIT Gandhinagar)
Chandrasheel Bhagwat (IISER Pune)
Purnaprajna Bangere (University of Kansas)
Kaushal Verma (IISc, Bengaluru)
Sourav Chakraborty (ISI, Kolkata)
Amartya Kumar Dutta (ISI Kolkata)
Athanase Papadopoulos (University of Strasbourg)
Amritanshu Prasad (IMSc, Chennai)
Kavita Ramanan (Brown University)
Joseph Samuel (RRI, Bengaluru)
B.R. Shankar (NIT Surathkal)
Kaneenika Sinha (IISER Pune)
Bankteshwar Tiwari (BHU Varanasi)
Srinivas Kirthy (IISc Bengaluru)

Typeset by Ambika Vanchinathan

COVER DESIGN Rajaneesh Kashyap

COVER IMAGE CREDITS
FRONT COVER TIFR Archives
BACK COVER Roberto Barnaba/ICTP Photo Archives

BHAVANA TRUST GRATEFULLY ACKNOWLEDGES FUNDING FROM PRATIKSHA TRUST

Published by C.S. Aravinda in Bengaluru for the Bhavana Trust. Printed by Gayathri Prints, Bengaluru

₹ 50

CURRENT SCIENCE

Volume 125 Number 3 10 August 2023

Man and insects – altruism and above

Anti-leprosy drug development

Flowering plants in the early Palaeogene of India

Current Science Association ■ Indian Academy of Sciences

Founded: 1932

ISSN: 0011–3891

CURRENT SCIENCE

Volume 125 Number 3

10 August 2023

226 **In this issue**

GUEST EDITORIAL

227 **Issue of enteric methane emissions from Indian livestock**
Raghavendra Bhatta

CORRESPONDENCE

229 **Evaluation of CSIR's innovation excellence indicators**
Gangan Prathap

231 **Estimating minimum energy requirement**
B. G. Desai; *Response by* Rupsha Bhattacharyya, K. K. Singh, R. B. Grover and K. Bhanja

NEWS

234 **Computational simulations**
Anant D. Kulkarni

235 **Current Science Reports**

COMMENTARY

239 **Implementation of recommendations of NEP 2020 – analysis and some suggestions**
H. A. Ranganath

GENERAL ARTICLES

241 **Man and insects – altruism and above**
Nivetha Ramanathan and Janarthanan Sundaram

247 **Why is it essential to critically study allied taxa while describing those new to science? A case study based on *Lepidagathis keralensis* (Acanthaceae)**
G. Gnanasekaran, A. F. J. King and W. Arisdason

REVIEW ARTICLES

253 **Increscent journey of anti-leprosy drug development**
Sakshi Gautam, Devesh Sharma, Sakshi Singh, Nirmala Deo, Anjana Goel, Vivek Kumar Gupta and Deepa Bisht

268 **Integrated antibiotic resistance surveillance: importance of harmonization and quality assurance of antibiotic susceptibility testing**
Sidharath Dev Thakur, Kavita Rana and Maansi Soodan

RESEARCH ARTICLES

277 **Impact of minimum support price on paddy cultivation: a micro level assessment**
Sudipta Paul, Biswajit Mondal, N. N. Jambhulkar, Asit Pradhan and G. A. K. Kumar

283 **Development of a sensor-based system to evaluate the actuating force of walk-behind type paddy transplanter**
Shiv Kumar Lohan, Mahesh Kumar Narang, Tarandeep Singh and Shikha Sharda

291 **Impact of land use/land cover on soil carbon and nitrogen fractions in north-eastern part of India**
S. Sinha, G. C. Banik, S. Mandal, S. Deb and M. K. Debnath

299 **Automated assessment of the extent of mangroves using multispectral satellite remote sensing data in Google Earth Engine**
Rupsa Sarkar, L. Gnanappazham and A. C. Pandey

309 **Reproductive behaviour in different aged adults of fall armyworm, *Spodoptera frugiperda* (J. E. Smith)**
J. S. Rupali, N. Ramya, D. Sagar, Vinod K. Padala, E. Vidya Madhuri and S. Subramanian

RESEARCH COMMUNICATIONS

317 **Genetic algorithms-based fuzzy analytical hierarchical process (GA-FAHP) for evaluating biofortified crop promotion strategies**
K. N. Singh, Mrinmoy Ray, Satyapriya, Shashi Dahiya, Jaya Pandey and Rajeev R. Kumar

321 **Pentamerous fossil flowers and fruits from Rajasthan reveals the dominance of flowering plants in the early Palaeogene of India**
Kajal Chandra, Poonam Verma, Anumeha Shukla and R. C. Mehrotra

324 **Biomass, carbon stock and sequestration of predominant tree species of Vikarabad Natural Forest lands, Telangana, India**
M. R. Apoorva, G. Padmaja, S. H. K. Sharma, K. Bhanu Rekha and S. Triveni

BOOK REVIEWS

330 **What is Dark Matter?** Peter Fisher; *reviewed by* Basudeb Dasgupta

331 **Annual Review of Nutrition, 2021.** Patrick J. Stover and Rudi Balling (eds); *reviewed by* G. Bhanuprakash Reddy

PERSONAL NEWS

332 **Kuppuswamy Nagarajan (1930–2023)**
H. Sivaramakrishnan

334 **Kalyanapuram Rangachari Parthasarathy (1936–2023)**
Kalyan B. Sinha

◀ COVER. Fossil fruits retrieved from the Gurha lignite mine. See page 321.

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

Thank You

Please do reach out to us if you need any additional information or assistance.

Central Library

National Institute of Science Education and Research

Email: libniser@niser.ac.in/librarian@niser.ac.in

Contact No. 0674-2494171

Website: https://www.niser.ac.in/library

OPAC: https://opac.niser.ac.in/

Digital Repository: http://idr.niser.ac.in:8080/jspui

IRINS Faculty Profiles: https://niser.irins.org/

NISER | Library | Repository | Web OPAC | IRINS