

ISSN No.: 3048-7943 Frequency: Quarterly Month: April 2025

Volume: 2 **Issue:** 2

BioThink

National Academy of Bio Sciences,

Madhur Vihar Phase-2, Lane no. 3, Near Bangali Kothi, Ajabpur Khurd, Dehradun, Uttarakhand, India – 248001

Editor in Chief

Vinay Chamoli Ph.D.(P), M.Sc.(Ag), ICAR-NET (2016), ICAR-NET (2021) President, BioThink- National Academy of Bio Sciences, Dehradun, Uttarakhand -248001

E-mail: vinaychamoli@biothink.in

Managing Editor

Dr. Anoop Badoni,
Ph.D., M.Sc.(Ag), MAPSR
Senior Scientist and Director
Plantica – Indian Academy of Rural Development, Dehradun,
Uttarakhand-248001

E-mail: badonianoop@plantica.in

Advisory Board



Prof. J. S. Chauhan

Head, Dept. of Seed Science and Technology, HNB Garhwal A Central
University, Srinagar -246174

E-mail: js99chauhan@gmail.com



Prof. C. S. Pandey
Dean, Dept. of Agriculture, Dolphin (PG) Institute of Bio Medical and
Natural Sciences, Dehradun
E-mail: cspandey1965@gmail.com



Dr. Anoop Badoni, Ph.D., FAPSR, FIBTCA, FSABM
Senior Scientist and Director
Plantica – Indian Academy of Rural Development, Dehradun,
Uttarakhand-248001
E-mail: dranoopbadoni@gmail.com/badonianoop@plantica.in

Editorial Board

Senior Associate Editor

Prof. (Dr.) Dinesh Baboo Tyagi, Ph.D., M.Sc. Ag, ICAR-NET

Professor, Head of the Department and Director, Department of Agriculture Sciences,

Mandsaur University, Mandsaur-458001 M.P. (India)

E-mail: dinesh.tyagi@meu.edu.in

Prof. (Dr.) Devendra Singh Rawat, Ph.D., M.Sc.

Dean and Professor, Department of Agriculture Sciences and Applied Sciences,

JBIT College of Applied Sciences – Sankarpur, Dehradun

E-mail: devendrasinghrawat86@gmail.com

Dr. Mamta Arya, Ph.D., M.Sc.

Senior Scientist,

ICAR – NATIONAL BUREAU OF PLANT GENETIC RESOURCES, BHOWALI, NAINITAL

E-mail: Mamta.Arya@icar.gov.in

Dr. Arun Bhatt, Ph.D., M.Sc. (Ag)

Professor.

Department of Biotechnology, G.B Pant Institute of Engineering and Technology (GBPIET), Ghurdauri, Pauri Garhwal, Uttarakhnd E-mail: arunbhatt@gbpec.ac.in

Associate Editor

Dr Harinder Singh Banyal Ph.D., M.Sc.

Associate Professor

Department of Biosciences, Himachal Pradesh University Shimla pin code 171005

E-mail: hsbbios@hpuniv.ac.in

Dr. Sachin Srivastav, Ph.D., M.Sc.

Associate Professor and Dean Academic Himalayan College (H.N.B.G. University), RIT, Roorkee, Uttarakhand E-mail: academicdean.hc@ritroorkee.com

Dr R P Srivastava, M.Sc.(Ag)., Ph.D

Associate Professor

Department of Agriculture Sciences,

Mandsaur University, Mandsaur-458001 M.P. (India)

E-mail: ramprakash.srivastava@meu.edu.in

Section Editor

Dr. Jaspal Chauhan, Ph.D., M.Sc., UGC-NET, ARS-NET

Assistant Professor

Department of Himalayan Aquatic Biodiversity, H.N.B. Garhwal University, Srinagar, Uttarakhand

E-mail: jaspal.chauhan@hnbgu.ac.in

Dr. T. S. Bisht, Ph.D., M.Sc.

Assistant Professor

Department of Horticulture, H.N.B. Garhwal University, Srinagar,

Uttarakhand

E-mail: tejpalbisht23@hnbgu.ac.in

Dr Nitesh Kumar, Ph.D., M.Sc.

Assistant Professor,

Department of Biosciences, Himachal Pradesh University Shimla

pincode 171005

E-mail: ncbios@hpuniv.ac.in

Dr Arti Jamwal Sharma, Ph.D., M.Sc.

Assistant Professor

Department of Bio Sciences, Career Point University, Hamirpur,

Himachal Pradesh 176041

E-mail: arti.botany@cpuh.edu.in

Dr Ardeep Kumar, Ph.D., M.Sc.

Scientist- Agronomy

Krishi Vigyan Kendra, VCSG Uttarakhand University of Horticulture

and Forestry, Bharsar, Pauri Garhwal- 246123

E-mail: ardeepkumarr4@gmail.com

Dr Ram Gopal

Assistant Professor

North Eastern Hill University, Tura Campus, Tura, Meghalaya – 794002

Email ID – rgksikar@gmail.com, rgopal@nehu.ac.in

Dr Bichhinna Maitri Rout

Assistant Professor

Department of Vegetable Science, Shiksha O' Anusandhan Deemed to be University (SOADU), Bhubaneswar, Odisha

Email ID - bichhinna31@gmail.com

Dr Anjay Singh Bisht

Assistant Professor

Department of Agriculture, Quantum, University, Roorkee, Uttarakhand Email ID – anjaybisht250@gmail.com

Dr Paramjeet Sajwan

Assistant Professor

Department of Horticulture, V.C.S.G. Uttarakhand University of Horticulture & Forestry, Bharsar Uttarakhand Email ID – paramjeetsajwan@gmail.com

Assistant Editor

Mr. Naveen Chandra

Assistant Professor

Department of Agriculture, Quantum, University, Roorkee, Uttarakhand Email ID – bahuguna651@gmail.com

Mr. Ankit Sati

Research Scholar

Department of Rural Technology, HNB Garhwal University, Srinagar Garhwal, Uttarakhand

Email ID – ankitsatihnbgu@gmail.com

Mr. Shailendra Tiwari

Research Scholar

Department of Seed Science and Technology, HNB Garhwal University, Srinagar Garhwal, Uttarakhand Email ID – shailendratiwari@hnbgu.ac.in/

tiwarishailendra96@gmail.com

Mr. Eshwar Singh

Research Scholar

Department of Rural Technology, HNB Garhwal University, Srinagar Garhwal, Uttarakhand

Email ID – eshunegi15023@gmail.com

Mr. Shubham Thapa

Research Scholar

Department of Seed Science and Technology, HNB Garhwal University, Srinagar Garhwal, Uttarakhand

Email ID - shubham27b@gmail.com

Mr. Chandan Kumar

Research Scholar

Department of Agriculture, RIMT University, Mandi Govindgarh (Punjab)

Email ID – chandankumar780789@gmail.com

Ms. Vandana Petwal

Research Scholar

Department of Agriculture, RIMT University, Mandi Govindgarh (Punjab)

Email ID – vandanapetwal75@gmail.com

Ms. Sonali Rajput,

Research Scholar
Department of Seed Science and Technology, HNB Garhwal
University, Srinagar Garhwal, Uttarakhand
Email ID – sonalirajput1532@gmail.com

Ms. Abha Rawat

Research Scholar,
Department of Seed Science and Technology, HNB Garhwal
University, Srinagar Garhwal, Uttarakhand
Email ID – abharawat0112@gmail.com

Ms. Meenakshi Joshi

Research Scholar,
Department of Seed Science and Technology, HNB Garhwal
University, Srinagar Garhwal, Uttarakhand
Email ID – meenujoshi.mj56@gmail.com

Mr. Madhwendra Kumar Pathak

Research Scholar, Department of Seed Science and Technology, CSAUAT, Kanpur (UP) Email ID – kumarmadhwendrapathak97@gmail.com From The Editor's Desk

Dear Readers,

We are delighted to present the **Second** issue of **Volume 2** of *BioThink – National*

Academy of Bio Sciences E-Magazine. This digital publication is dedicated to advancing

plant science by sharing accessible, high-quality content. BioThink serves as a vibrant

platform for researchers, academics, and plant enthusiasts to explore the latest innovations,

from genetics and biotechnology to ecology and sustainable agriculture.

Our mission is to bridge the gap between research and real-world application, with a

strong focus on sustainability, biodiversity, and ecological health. By offering open-

access, expert-curated articles, we aim to inspire, inform, and foster collaboration across

disciplines within the plant science community.

We envision *BioThink* as a leading resource that connects and empowers a global network

committed to the future of plant science.

With Warm Regards

Vinay Chamoli,

Editor in Chief

vii