

# Rudra Narayan Sahoo

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## Summary

Proactive plant scientist with a strong background in experimental and statistical analysis skills, trained in **Plant-Microbe Interaction, Root Stress Physiology, Natural Resource Management, Ethnobotany, Ethnopharmacology, Plant Stress and Molecular Biology**. I have **over two years** of **multi-domain experience** in **academic teaching, leadership, and volunteering**.

## Education

### Master of Science in Botany

Jamia Hamdard, New Delhi

Sep. 2021 - May. 2023

- **First Division with Distinction: 8.35/10.0 CGPA (Top 5 %)**

### Post Graduate Diploma in Intellectual Property Rights

Indira Gandhi National Open University, New Delhi

Jul. 2020-Jul. 2021

- **First Division (Top 10 %)**

### Bachelor of Science in Life Science (Chemistry, Botany, Zoology)

Ramjas College, University of Delhi, Delhi

Jul. 2017- Jul. 2020

- **First Division: 8.227/10.0 CGPA**

## Publications

- **In Press:- Sahoo Rudra Narayan**, Mahawar Sachin, Arya Atul\*. Antimalarial response, traditional and other potential uses of *Croton* genera. Chapter 13. Antimalarial Medicinal Plants, *Taylor & Francis Group, LLC* (Book Chapter). 2023 August.
- **In Preparation:-** Gupta Suchi, **Sahoo Rudra Narayan**, Bhattacharya Neetu, Roy Souvik, Senapati Sabyasachi, Bakshi Amrita, Bhattacharya Amit, Maurya Shashank Kumar\*. Natural Products as an emerging therapeutic approach in the management of Gastric Cancer, *Journal of Ethnopharmacology*, 2023 August.
- **Sahoo Rudra Narayan**, Kumar Suresh\*, Suryavanshi Amrita, Kain Dolly, Arya Atul, Chaudhry Bharti. The religious and medicinal aspects of plants used in India: an ethnobotanical review. *Journal of Drug Research in Ayurvedic Sciences; Wolters Kluwer-Medknow Publication, Central Council for Research in Ayurvedic Sciences (CCRAS), Ministry of AYUSH, Government of India, New Delhi*, Published 2022 March 25. [\[Link to Publication\]](#) [\[PDF\]](#)
- Arya Atul, Kumar Suresh\*, Paul Rajinder, Suryavanshi Amrita, Kain Dolly, **Sahoo Rudra Narayan**. Ethnopharmacological survey of indigenous medicinal plants of Palampur, Himachal Pradesh in North-Western Himalaya, India. *Advances in Traditional Medicine; Springer Singapore Publication*, Published 2021 September 9. [\[Link to Publication\]](#) [\[PDF\]](#)

## Selected Academic Conferences

- **Awarded with Certificate of Merit for Presentation on 'Marine Arctic Peace Sanctuary (MAPS)'** at: 'International Environment Leadership Program Level-2', St. Joseph's College (Autonomous) Kozhikode, Kerala, India and Institute of BioEcoScience, Virginia, USA, and **successfully completed the course with a score of 9.5/10**; 2022, May 17-19.
- **Oral presentation** at: National Webinar on 'Intellectual Property Rights: Issues and Challenges' Department of Botany, Deen Dayal Upadhyaya College, University of Delhi on 'Protection of Farmer's and Breeder's Rights through IPR'; 2021, September 24-25.
- **Oral presentation** at: The 1st International e-Conference (iCiAsT 2020) on 'Innovation Approaches in Agriculture, Applied Sciences and Technologies' under the theme of Importance of Biodiversity and Bioresources in the Post COVID Era' 19th on 'The religious and medicinal uses of plants in India; an ode to conservation'; 2020, December 14-15; Virtual conference.
- **Poster presented** at: National Seminar on 'Recent Trends of Research in Medicinal Plants and Applied Sciences' Department of Botany, Ramjas College, University of Delhi on 'Genetic Improvement of Rice for Food Security and Sustainable Development, Achievements and Challenges'; 2019, March 27.

## Academic honours and achievements

- **All India Rank 41** among **76325** students in **Joint Council of Scientific and Industrial Research (CSIR) - University Grants Commission (UGC) National Eligibility Test (NET) EXAMINATION, 2021**.
- Recipient of **Junior Research Fellowship (JRF)** from the prestigious **Council of Scientific and Industrial Research (CSIR), Ministry of Science and Technology, Govt. of India**.

## Research Experience

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### Council of Scientific and Industrial Research (CSIR)- Junior Research Fellow (JRF) |

Guide: Dr. Senjuti Sinharoy

Root Nodule Symbiosis Lab, National Institute of Plant Genome Research (NIPGR), New Delhi

Jul. 2023 - Present

- **Project Title: 'Characterization of culture-dependent rhizobial diversity from chickpea nodules interior.'**
- Isolation of populations from nodule interior and preparing a tailor-made rhizobial inoculant for chickpea after evaluating the nitrogen fixation and the competitiveness of the rhizobial inoculum using the recently developed techniques for different soil conditions.
- Implementing repetitive re-isolation and re-inoculation approach (adaptive laboratory evolution) to improve the symbiotic efficiency of the rhizobia and genome-sequencing of the mother and adopted strains.

### Post-graduate Dissertation Student | Guide: Dr. M. Iqbal R. Khan

Plant Systems Biology Lab, Department of Botany, Jamia Hamdard, New Delhi

Nov. 2022 - May. 2023

- **Dissertation Title: 'Delineating the potential of root phenotypic and physiological attributes of wheat genotypes under stress conditions.'** [PDF]
- Investigated the root system architecture and systemic physiological responses in **50 wheat genotypes** under optimal and challenging environmental conditions.
- Evaluated the growth perspectives, retention and acquisition of mineral nutrient to mitigate salt-induced damages in rice cultivars.

### Independent Researcher | Co-author: Mr. Atul Arya, M.Phil

Department of Botany, Ramjas College, University of Delhi, Delhi

Oct. 2022 - Mar. 2023

- First-authored a book chapter on the 'Antimalarial response, traditional and other potential uses of *Croton* genera.' through a comprehensive literature review of **100+ articles**, identified and evaluated the potential antimalarial properties of *Croton* genera.

### Independent Researcher | Co-author: Dr. Amit Bhattacharya

Department of Zoology, Ramjas College, University of Delhi, Delhi

Jan. 2022 - Sept. 2022

- Collaborated with a team of researchers and critically reviewed, wrote and co-authored a systematic review on natural products and their role in the regulation of gastric cancer.

### Young Advantage Program (YAP) Intern | Guide: Dr. Sreenath Subrahmanyam

Institute of BioEcoScience, Virginia, United States

Jan. 2022 - Jun. 2022

- **1 of 69 interns selected out of 1500** for 'Young Advantage Program'; completed six-month (4 credits = 120 hours) course on '**Natural Resource Management and Scientific writing**' with training in ecological modelling, scientific interactions and lectures from professors around the world.

### Research Intern | Guide: Prof. Suresh Kumar

Medicinal Plant Research Lab, Ramjas College, University of Delhi, Delhi

Dec. 2019, Jan. 2021 - Jul. 2021

- Conducted an extensive ethnobotanical and ethnopharmacological survey of **102 indigenous medicinal plants** and interviews of **77 informants** of Palampur, Himachal Pradesh in North-Western Himalaya, India.
- Specialized in conventional extraction techniques (Soxhlet and Water bath) and Rotary Evaporator for preparation of both crude and pure extract for qualitative analysis.

### Undergraduate Research Intern | Guide: Prof. Ashwani Pareek

Stress Physiology and Molecular Biology Laboratory, School of Life Sciences, Jawaharlal Nehru University, New Delhi

May. 2018 - Jul. 2018, Dec. 2018

- Examined genetic improvement of rice (IR64) variety through forward genetics approach of **5000 mutant lines**.
- Scrutinized and analyzed drought-resilient mutant lines in relation to different physiological parameters under greenhouse and field conditions.

## Course Projects

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### Plant Growth Regulators Involvement in the Regulation of Abiotic Stress Tolerance [PDF]

Course: Seminar, Guide: Dr. M. Iqbal R. Khan

Spring '23

- Summarized the implications of the review for the development of climate resilient crop cultivars and identified the key phytohormones and growth regulators involved in abiotic stress tolerance.
- Executed a comprehensive review of **220+ research articles** on the role of phytohormones and growth regulators in the regulation of abiotic stress tolerance.

### Ethnobotanical Survey of Medicinal Plants in Palampur, Himachal Pradesh [PDF]

Course: Ethnobotany, Guide: Prof. Suresh Kumar

Spring '20

- Surveyed ethno-botanically important medicinal plants found in the hilly areas of Palampur and obtained information on **15+ medicinally important plants** and interviewed **2 traditional healers** to collect information about the plants.

### Study of Medicinal Plants at Forest Research Institute (FRI) and Botanical Survey of India (BSI), Dehradun, Uttarakhand [PDF]

Course: Medicinal Botany, Guide: Prof. Suresh Kumar

Fall '19

- Identified **140 medicinal plants** with potential to cure dreadful diseases and described the flora of FRI and BSI institutes in Uttarakhand to understand their role in conserving biodiversity.

## Skills

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- **Molecular Biology and Genetic Engineering Techniques:** Bacterial/Plant Genomic DNA extraction, Plasmid isolation, 16s DNA amplification and cloning, Biparental mating, Primer designing, Colony PCR, Overlapping PCR, Agarose Gel Electrophoresis, Gel Elution, Restriction digestion, Vector and Insert Ligation, Transformation in *E.coli*, Genomic DNA library preparation. Transactivation Assay in (*Nicotiana benthamiana*), Agrobacterium-based plant transformations and infiltrations.
- **Plant Stress Physiology Techniques:** Phenotyping, Shovelomics, Chlorophyll estimation (SPAD 502-meter), Staining, Flame photometer, CHNOS analyser, photoperiodic, relative humidity and photosynthetically active radiations (PAR) equipped Greenhouse handling, operating and handling plant growth chambers and B.O.D., dry and hot sample incubation machines.
- **Ethnobotany and Ethnopharmacology Techniques:** Herbarium making, Rotary Evaporator, Soxhlet.
- **Microscopy and Imaging Techniques:** Plant tissue sectioning, Stereo Microscopy, Confocal Microscopy.
- **Physical Science Research Skills:** Analytical Techniques- Titrations- Acid-base, Redox, Complexometric, Potentiometric titration, Volumetric Analysis, Gravimetric analysis, Colorimetry, Spectrophotometry.  
Organic Chemistry- Purification by Crystallization, Systematic Analysis, Inorganic Analysis- Systematic Analysis of Inorganic Compounds.
- **Statistical analytic Skills:** Quantum GIS, R (Programming Language), Origin (Software), SigmaPlot (Software), Image analysis, MS-Excel, MS-Word, MS-PowerPoint.
- **Academic writing Skills:** Scientific Writing, Graphical representation of repository data (Biorender), Reference formatting and management (Zotero), Communication skills, Team work.

## Relevant Coursework

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- **Under-graduate Coursework (along with Lab):** Biodiversity (Microbes, Algae, Fungi and Archegoniate) B+ (7/10), Environmental Science A+ (9/10), Plant Ecology and Taxonomy B+ (7/10), Plant Anatomy and Embryology A (8/10), Physiology and Biochemistry A+ (9/10), Plant Physiology and Metabolism A+ (9/10), Genetics and Evolutionary Biology A (8/10), Cell and Molecular Biology A (8/10), Economic Botany and Biotechnology O (10/10).
- **Post-graduate Coursework:** Cell and Molecular Biology\* A (8/10), Plant Biochemistry and Metabolism\* A+ (9/10), Microbiology and Plant Pathology\* A (8/10), Genetics and Cytogenetics\*\* B+ (7/10), Plant Physiology\*\* A (9/10), Academic Writing O (10/10), Tools and Techniques in Biology\*\*\* A (8/10), Plant Ecology and Biodiversity\*\*\*\* A (8/10).
- **Post-graduate Lab Course:** Lab\* A+ (9/10), Lab\*\* A (8/10), Lab\*\*\* A+ (9/10), Lab\*\*\*\* B+ (7/10).

## Additional Courses

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- **Ask Questions to Make Data-Driven Decisions | Coursera- Google Professional Certificate:** Sep. 2022
- **Foundations: Data, Data, Everywhere | Coursera- Google Professional Certificate :** Dec. 2021
- **Patenting in Biotechnology | Coursera - Technical University of Denmark (DTU), Copenhagen Business School:** Feb. 2021

## Academic Service

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- **Student Coordinator** for 'Exhibition on Medicinal Plants' during National Seminar on 'Recent Trends of Research in Medicinal Plants and Applied Sciences', organized by Department of Botany, Ramjas College, University of Delhi; 2019, March 27.
- **Coordinated** a 'workshop' on 'Career counselling' by Mr Akshat Agarwal, Renewals Specialist, Adobe Systems India Pvt.Ltd, organized by Department of Botany, Ramjas College, University of Delhi; 2019, March 2.

## Volunteering/Teaching Experience

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- **Marine Arctic Peace Sanctuary (MAPS) Ambassador | Parvati Foundation, Toronto, Canada:** Involved to spread awareness against climate change and preserve the health of our seas for a sustainable future; Dec. 2021 - Present.
- **Educator | Angel Express Foundation, Mumbai Maharashtra :** Teaching Volunteer for Class 9 students at Malad branch of Angel Express Foundation, Mumbai, Maharashtra; Jun. 2021 - Present.
- **Private Academic Tutor | Self-Employed, Delhi :** Tutored several students at school level of classes 3,4,5,7,9 and 10 for Sciences, Mathematics, Social Sciences, English; Dec. 2020 - Feb.2023.
- **Teaching Volunteer | Teach for India, New Delhi:** Facilitated learning, developed and implemented educational worksheets, conducted comprehensive evaluations of student homework, and provided assistance during synchronous learning sessions for Class 5 students at Gangotri Public School, Delhi, under Teach for India 'Volunteer Program'; Feb. 2021- May. 2021.
- **Teaching Volunteer and Practical Lab Skills Demonstrator | Department of Botany, Ramjas College, University of Delhi :** Trained Class 9 students of Amar Singh Inter College, Lakhaoti, Bulandshahr, Uttar Pradesh, as a part of Outreach program on 'Hands-on training on Various Scientific Aspects Related to Biology'; Mar. 2019.
- **Art and Craft Demonstrator, Care Taker for Children | Tapaswini Nav Sadhna, New Delhi:** Volunteered for underprivileged children event 'Kilkari: Share the Laughter' for the celebration of Children's Day. ; Nov. 2018.