MACS

Annual Report 2024-25

Agharkar Research Institute
ARI-MACS
Estd. 1946

Maharashtra Association for the Cultivation of Science
Agharkar Research Institute

Vision

To excel as an internationally recognized centre of multi-disciplinary research in science and technology

Mission

a. Conduct basic and applied research in life and related sciences for human betterment

b. Explore the genetic diversity of microbes, plants and animals

c. Develop sustainable technologies for a cleaner environment, agriculture and better health

Objectives

a. Undertake research in cutting-edge science and its applications

b. Develop and translate technologies for cleaner environment and better health

c. Develop and adopt practices for sustainable agriculture

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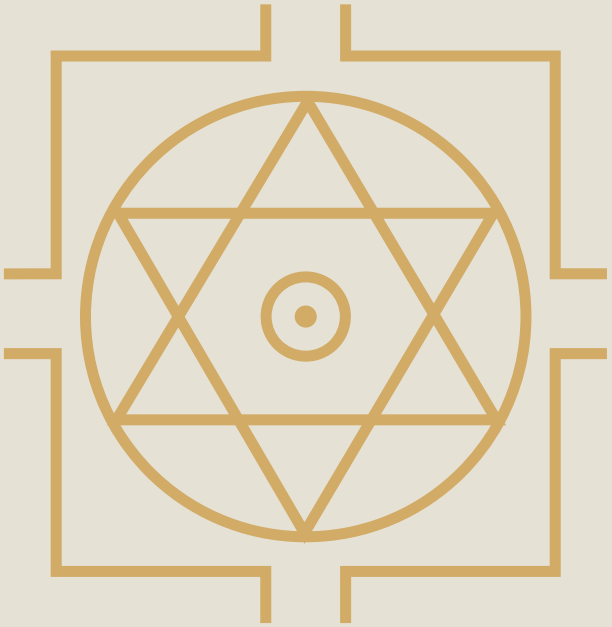

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Contents

Foreword

Dr Anil Kakodkar

President
Maharashtra Association for the Cultivation of Science
Pune

Agharkar Research Institute (ARI) continues to distinguish itself through high quality basic research as well as its translation to value creation for society and industry. The Annual Report of ARI for the year 2024–25, documents this year's progress in its march of sustained excellence. As the President of the Maharashtra Association for the Cultivation of Science (MACS), the parent body of ARI, I view this document as tangible evidence that ARI continues to excel as an internationally recognized centre of multi-disciplinary research in science and technology.

This year's achievements underscore the profound commitment of our scientific community to ARI's Mission: to harness the genetic diversity of microbes, plants, and animals for a cleaner environment, sustainable agriculture, and better health. Across all three core objectives—undertaking cutting-edge science, developing translatable technologies, and adopting sustainable practices—our teams have delivered results that directly benefit the nation and its citizens.

Translational Impact and Protection of National Assets

A key focus this year was the translation of research into industrial and environmental security solutions. The commissioning of the pilot-scale 1000L biohydrogen and 2000L biomethane production facility is a landmark achievement, positioning ARI as a leader in developing models for decentralized clean energy from agricultural waste. Simultaneously, our Bioenergy group delivered a critical infrastructure protection solution with a bacteriophage formulation that achieved a remarkable over reduction in agents causing microbially induced corrosion (MIC) in the oil and gas industry—a vital step in protecting national assets.

Furthermore, our commitment to environmental stewardship was fortified by the development of the Western Ghats Endemic Diatom Index (WGEDI), a high-precision tool that has already provided critical intelligence on the health of this crucial biodiversity hotspot.

Advancing Health and Agriculture

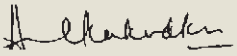
The benefits of ARI's research have strongly impacted public health and sgriculture. In health, the Nanobioscience team's breakthrough in creating a silver "nanocoat" for dental implants offers a significant step towards reducing surgical infection rates and improving patient outcomes. The Bioprospecting program provided scientific validation for traditional knowledge, demonstrating the potent cardioprotective effects of Protocetraric acid from lichens and the neuroprotective efficacy of *Crinum woodrowii* extracts in Alzheimer's models.

For agriculture, ARI delivered immediate economic advantages. The deployment of methanotroph bioinoculants resulted in an - higher grain yield and, critically, a -day early harvest for rice farmers. Our Genetics and Plant Breeding program advanced climate-resilient wheat, achieving an incredible germination rate under restricted irrigation, and confirmed a increase in soybean yield through technology transfer efforts, directly enhancing farmer profitability and resilience.

Sustaining the Future

The excellence achieved is the result of focused dedication of the institution to high quality research. We secured valuable intellectual property with the grant of a patent for a Nucleic Acid-Based Test Kit, ensuring protection of our innovations. Most importantly, our capacity building efforts yielded results, with 13 PhD degrees awarded and over 180 students and trainees passing through our doors, fortifying the talent pipeline for India's scientific future.

On behalf of MACS, I extend my deepest gratitude to the Department of Science & Technology, Government of India, and all collaborators, both national and international, for their unwavering support. I congratulate the entire ARI faculty and staff for this impressive record of achievement. We remain steadfast in our pursuit of scientific excellence to ultimately serve for the betterment of society.



Anil Kakodkar
President, MACS

Executive Summary

Dr PK Dhakephalkar

Director
Agharkar Research Institute
Pune

It is my pleasure to present the Annual Report for the Agharkar Research Institute (ARI) for the period 2024–25. This year has marked a period of intense focus on our core Mission: applying multi-disciplinary research to secure cleaner environments, sustainable agriculture, and better health. Our teams have successfully translated cutting-edge discoveries into high-impact, actionable technologies across all strategic objectives.

Breakthroughs in Sustainable Agriculture

Our commitment to sustainable and profitable farming delivered immediate, quantifiable results for the agricultural sector:

- **Accelerated Rice Harvest:** We successfully deployed methanotroph bioinoculants in field trials, resulting in a consistent - higher grain yield and, critically, a -day early harvest for rice. This innovation boosts farmer profitability while mitigating climate vulnerability.
- **Drought-Proof Wheat:** The Genetics and Plant Breeding group engineered next-generation wheat lines that achieved an impressive germination rate under restricted irrigation and deep-sown conditions, making them ideal for drought-prone regions and conservation agriculture.
- **Empowering Farmers:** Through strategic technology transfer, we confirmed that improved soybean cultivation practices lead to a proven increase in yield, demonstrating the direct economic benefit of our research on the ground.

Advancements in Environmental Security and Bioenergy

ARI strengthened its role as a leader in environmental science and clean energy innovation:

- **New Bioenergy Model:** We commissioned a state-of-the-art pilot-scale biohydrogen and biomethane production facility. This facility serves as a vital national model for converting agricultural waste into clean, renewable fuel, supporting the circular economy.

- **Protecting Important Infrastructure:** In a major win for industrial security, our Bioenergy team developed a bacteriophage formulation that achieved over efficiency in controlling microbially induced corrosion (MIC) in oil and gas pipelines, providing a superior and sustainable alternative to chemical methods.
- **Environmental Monitoring:** The development of the Western Ghats Endemic Diatom Index (WGEDI)provides a new, sensitive tool for ecological monitoring. Its initial deployment revealed that streams in the Western Ghats are in moderate to poor condition, providing crucial data for targeted conservation efforts.

Innovations in Health and Nanomedicine

Our research continued to yield promising applications for public health and wellness:

- **Prophylactic Implants:** The Nanobioscience group designed a silver "nanocoat" for dental implants that exhibits excellent antibacterial activity against periodontal pathogens while promoting successful bone cell integration, addressing a significant clinical challenge.
- **Targeted Cancer Therapy:** We advanced the fight against aggressive cancers like triple-negative breast cancer by developing targeted lipid polymer hybrid nanoparticles for the precision co-delivery of therapeutic drugs, maximizing treatment efficacy.
- **Traditional Medicine Validation:** Our Bioprospecting program provided scientific validation for potential natural therapies, confirming the potent cardioprotective effects of Protocetraric acid from lichens and the neuroprotective efficacy of *Crinum woodrowii* extracts in Alzheimer's models.

In addition to these programmatic successes, ARI reinforced its foundation by securing a new patent for a Nucleic Acid-Based Test Kit and fostering the next generation of talent, with PhD degrees awarded and over students and trainees gaining hands-on research experience.

I thank the dedicated faculty, staff, and students of ARI, our parent body MACS, and the Department of Science & Technology for their commitment to translating the Vision of ARI into tangible national achievements.

PK Dhakephalkar
Director, ARI, Pune

ARI Scientists

Biodiversity and Palaeobiology Group


Dr Sanjay K Singh


Dr Bhaskar C Behera


Dr Paras Nath Singh


Dr Ritesh K Choudhary


Dr Karthick Balasubramanian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Dr Yogesh A Karpe

Dr Sachin H Jadhav

Biodiversity and Palaeobiology

Biodiversity

Bacteria & Archaea

Application of methanotrophs in rice agriculture for methane mitigation and plant growth promotion

In continuation with our studies on rice agriculture and the effects of its associated methanotrophs, this season's trial was based on studying the impact of methanotroph bioinoculant on rice cultivars using dipping method. One field trial was conducted in farmers field in Malegaon, Lavasa Road near Mulshi from June-November 2024. The field was chosen based on consent from the farmer already practicing rice farming with minimum fertilizer input (50kg Urea/ acre or roughly 50 kg N/ha). The treatment efficiency was assessed in terms of total grain yield, grain weight, plant height, flowering, and the effect on the methane oxidation capacity of the soil. Methanotrophs were grown on a larger scale (20-30L) where the methanotroph grew as an upper layer and scooped off. Of this ~2L of each fully grown and fresh culture was carried to the field in plastic cans, which consisted of ~1-2 OD of the culture. The following methanotrophs were used: *Methylomonas* strain Kb3 (this methanotroph has been one of the promising candidates for the application) and *Methylomagnum ishizawai* strain KRF4 (a large methanotroph, and a second candidate for the application) and a combination of the two in equal proportion. A control was kept with uninoculated plants. The plants were planted in a pre-marked rectangle of 4m x 3m in rows using a rope with a 25cm distance between each plant hill, resulting in roughly 16 plant hills per square meter and ~192-200 plant hills per treatment. After transplantation, the plants were allowed to stand in water, and no special treatment was given for the microbes to stick to the roots, thus allowing only tightly attached bacteria to get carried over further. In the field trial taken at Malegaon (**Figure 1**) it was seen that *Methylomonas* Kb3 treatment and the mixed MOB treatment to plantlets at the transplantation stage proved helpful, as there was a considerable increase in plant height (11%) and 10%, respectively and the total grain yield ~5 quintal/ha and ~4 quintal/ha, respectively, compared to the control). Thus, a ~8-10% higher grain yield was seen in the case of Kb3 and Kb3+KRF4 inoculation. Additionally, the plants inoculated with *Methylomonas* Kb3 showed early flowering, grain development, and grain maturation roughly 15 days before the other plants, reducing the rice season by 2 weeks. This may help in the early harvesting of the rice and protect it from further climate change-related hazards. *Methylomonas* strain Kb3, an indigenously isolated methanotroph, had repeatedly given consistent results regarding plant growth promotion. This methanotroph would be used as the candidate for the bio-inoculant formulation. A similar trial is being done in the winter-summer season in Gondiya.

Isolation of methanotrophs from various wetlands in Maharashtra (such as from Bhigwan, Mulshi, Tamhini, Mahabaleshwar, Mumbai, Pune, and Diveagar) resulted in the isolation of ~25 new methanotroph cultures, of which all 25 methanotrophs were characterized using *pmoA* gene amplification and sequencing. Eight isolates were axenic (pure) and were further characterized by 16S rRNA gene sequencing. *pmoA and* 16S rRNA gene sequences have been deposited in the NCBI database. The phylogenetic tree showed that the methanotrophs were highly diverse.

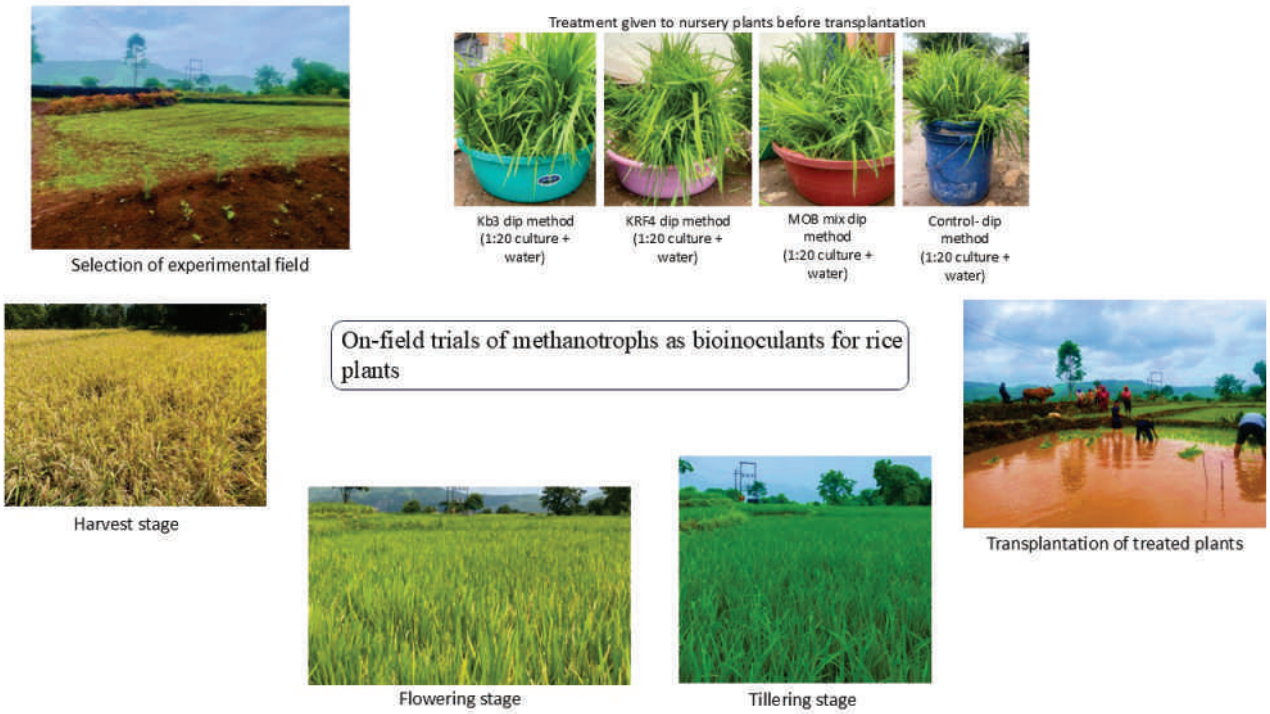


Figure 1
Field experiment in Malegaon: Treatment of methanotrophs at the transplantation stage

Methanotrophs were cultured from various types of soils from the Terai ecozone. About 18 methanotrophs were purified from the enrichments obtained from the samples collected from various regions of the Terai ecozone (forest, marshes and grasslands). Mostly, Type I methanotrophs of the genus *Methylobacter* and Type II methanotrophs of the genus *Methylocystis* were isolated as depicted by their *pmoA* gene sequences.

Anaerobic sulfate-reducing bacterium

For MIC studies, CP3-9, an obligate anaerobic sulfate-reducing bacterium, was isolated from a western offshore hydrocarbon reservoir in India. Identified as *Oleidesulfovibrio alaskensis* via 16S rRNA sequencing, it exhibited rod-shaped morphology under SEM. Its genome consists of a single circular chromosome (3.72 Mbp, 57.7% GC content) and shares high similarity (99.1% ANI, 93.6% DDH) with *O. alaskensis* DSM 1020. RAST annotation revealed 239 subsystems, 61 RNA genes, and 3814 protein-coding genes. Functional gene analysis identified key sulfate reduction genes: sat, aprAB, dsrA, dsrB, dsrD, and the highly conserved dsrC, involved in sulfur metabolism. The complete dissimilatory sulfate reduction pathway was also mapped using KEGG, indicating CP3-9's strong metabolic potential in corrosive environments. Various mitigation strategies such as conventional biocides (NANA and amines), Silver nanoparticles and bacteriophage (Ø) isolated from Ganga River were explored to control CP3-9. Phage treatment exhibited >93% reduction in H_2S production, outperforming the biocides and silver nanoparticles.

Thermophilic anaerobic bacterial diversity

A comprehensive exploration of thermophilic anaerobic bacterial diversity associated with lignocellulose degradation across ten Indian hot springs spanning varied geothermal zones was undertaken. A total of 83 strains were isolated using lignocellulosic substrates under strict anaerobic conditions and were classified into 19 species across 13 genera, including *Caldibacillus*, *Caloramator*, *Clostridium*, *Thermoanaerobacterium*, and *Sporanaerobium*. Several strains demonstrated notable hydrolytic activity against untreated rice and wheat straw and produced biofuels such as hydrogen and ethanol, along with volatile fatty acids (VFAs),

including acetic, butyric, and propionic acid. Particularly promising candidates, *Caldibacillus thermoamylovorans*, *Thermoanaerobacter wiegelii*, and *Thermoanaerobacterium aotearoense*, exhibited robust performance in high-temperature fermentation without requiring thermochemical pretreatment. Genus- and strain-level differences were evident in both enzyme activity and fermentation profiles, highlighting significant untapped ecological and functional diversity.

The biohydrogen production potential (BHP) of psychrophilic organisms was also studied. Field sampling expeditions in extreme environments of Leh Ladakh (glaciers, hot springs, and rivers) yielded over 350 microbial strains adapted to diverse temperature regimes. These isolates were characterized and evaluated for BHP through controlled batch fermentations. MALDI-TOF and 16S rRNA gene sequencing confirmed taxonomic identities. Among the mesophilic isolates, strain ATM1 exhibited the highest yield of 367.99 ml H_2/g glucose, followed by ATM19 (244.61 ml/g) and ATM22 (192.08 ml/g). These strains also produced diverse volatile fatty acids, confirming robust fermentative metabolism. Thermophilic isolates showed lower gas production, while psychrophilic cultures exhibited moderate activity, confirming adaptability to low temperatures. Several novel bacterial species such as *Alkalimonas mucilaginosa* sp. nov. and *Alkalihalobacterium chitinilyticum* sp. nov. were described, with emended descriptions of Oceanospirillaceae. Efficient hydrogen-producing strains are now being added to the MCM culture collection, supporting national biodiversity preservation and future industrial applications.

Fungi & Lichens

Fungi

Biodiversity, Systematics and Conservation of Fungi

As part of biodiversity exploration efforts in the Western Ghats aimed at enriching the National Fungal Culture Collection of India (NFCCI WDCM 932), Pune, extensive surveys were carried out across various habitats in the region. These efforts have led to the publication of six new fungal species and one new genus, along with the documentation of three new geographic records. The phylogenetic analyses have resolved the taxonomic confusion between *Thaxteriellopsis* and *Moorella*, reinstating priority for *Moorella* in accordance with the ICN; one fungus one name principle. The formerly uncertain classification of *Megacapitula* has been clarified by the introduction of a new fungal family, *Megacapitulaceae*, based on multigene sequencing and phylogenetic analysis. In addition, a new species of *Aspergillus dhakephalkarii* (NFCCI 5750^T) report during this period.

During period of report, several foliar pathogens, mushroom, bioagents, mushrooms, alkali tolerant fungi, endophytic actinomycetes genera like from medicinal plants, and aquatic fungi like organisms and actinomycete genus like *Streptomyces* spp. *Microbacterium* and genera of diverse interesting taxonomic groups of fungi were cultured *In vitro*, and their taxonomic identity were confirmed based on morphological and molecular analysis which are as follows: *Fusarium*, *Microsporum*, *Aschersonia*, *Latiporus*, *Tremitomyces*, *Coprinus*, *Volvariella*, *Beltraniella*, *Pestalotiopsis*, *Perenospora*, *Giastrum*, *Lasiodiplodia*, *Nectria*, *Polyporus*, *Conidiobolus*, *Cercospora*, *Saprolegnia*, *Achlya*, *Newbya*, *Pythium*, *Epicoccum*, *Curvularia*, *Bipolaris*, *Colletotrichum*, *Zasmidium*, *Cercospora*, *Chaetomium*, *Pseudocercospora*, *Periconia*, *Phakopsora*, *Uromyces*, *Oidium, Leveilulla, Leveillula* etc.

In addition to this, three novel species of different genera like *Polyporus* sp. nov., *Volvariella* sp. nov., *Conidiobolus srinivasanii* sp. nov., and *Newbya oblongata* were confirmed by biphasic approaches, morphological, cultural, and multigene phylogenetic analysis.

Endophytic fungi from *Cynodon dactylon* have garnered interest in their ability to produce bioactive secondary metabolites. This study aimed to identify such fungi and evaluate their antimicrobial and antioxidant

potential, contributing to sustainable alternatives in pharmaceuticals and agriculture. Twenty-one endophytic fungi were successfully isolated from the inflorescence, culm, and leaf tissues of *Cynodon dactylon*. Through morphological and molecular characterization, key species such as *Aspergillus chevalieri, Aspergillus stellatus, Hypoxylon* sp., and *Xylaria apiculata* were identified. These isolates demonstrated significant antifungal activity against major phytopathogens including *Sclerotium rolfsii, Aspergillus niger*, and *Fusarium oxysporum*. Assessment of antioxidant activity using the DPPH assay revealed that extracts from *A. chevalieri, A. stellatus*, and *Hypoxylon* sp. had strong free radical scavenging abilities, with IC50 values below 15 µg/ml. Particularly, extracts from *A. chevalieri and Hypoxylon* sp. achieved more than 85% inhibition at higher concentrations.

During the year, significant progress was made in fungal biodiversity and bioprospecting studies. A novel species, *Fusarium kamalianum*, was isolated and described from the ornamental palm *Chamaedorea seifrizii*, expanding our understanding of the *Fusarium oxysporum* species complex and its impact on ornamental plants. Another noteworthy contribution was the discovery and whole-genome sequencing of *Alanomyces manoharacharyi*, an endophytic fungus from *Azadirachta indica*, which revealed promising pharmaceutical and cosmetic potential due to its unique metabolite profile. Additionally, a comprehensive survey of 176 endophytic fungal isolates from diverse hosts across India led to the identification of 31 genera, with a focus on antimicrobial and alkali-tolerant strains. In-silico docking and LC-MS-based profiling demonstrated the efficacy of selected isolates, such as *Xylaria* and *Nigrospora*, against clinical pathogens, highlighting their applicability in developing new antimicrobial agents. These studies collectively contribute to fungal taxonomy, genomics, and bioactive metabolite discovery with potential industrial and therapeutic applications.

Lichens

A field tour in high altitude (altitude ranges from 4500 – 12500 feet) areas of Uttarakhand, such as Mana, Auli, Gorson Bugyal, Chopta, Tungnath Hills, Chandrashila Top, Ukhimath, Urgam valley, Joshimath and other surrounding areas was carried out. The area was surveyed, and lichen samples of foliose, fruticose, crustose and rock lichens (ca.150) have been collected. Collected samples were segregated to their respective group depending upon their growth forms/genus/family etc. and processed for preservation / deposition in recognized Ajrekar Mycological Herbarium (AMH) at ARI, Pune.

The lichen specimens collected during field tours were explored for Chemo-taxonomic studies of lichens and lichen compounds present in it, using TLC method. Evaluated the TLC data according to their Rf values, by using 'Wintabolites' software for identification of lichen substances (Mietzsch, Lumbsch and Elix; 1992).

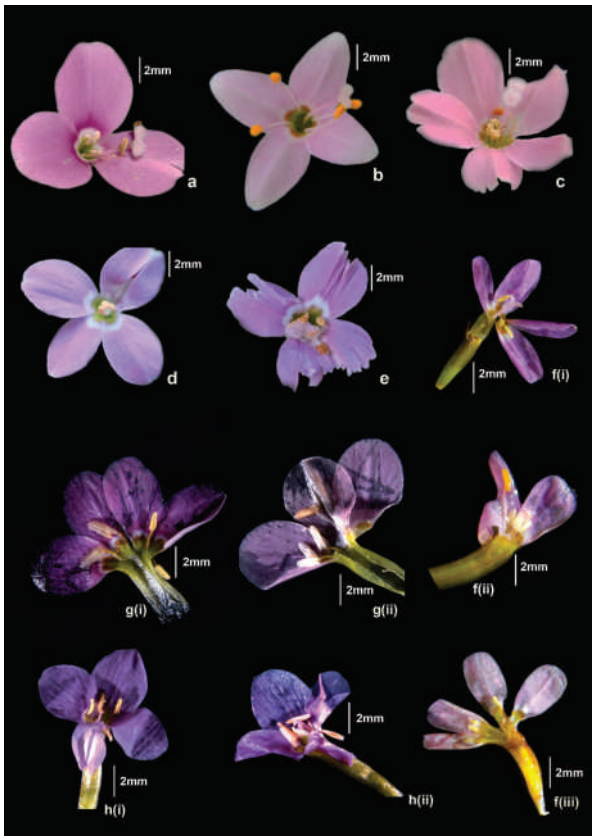
Plants & Diatoms

Revisiting the taxonomy of the wild relatives of *Sarsaparilla* (*Smilax* L.) in India, developing super-barcodes and understanding their diversification using phylogenomic tools

The genus *Smilax* (Sarsaparilla), with around 262 species globally, remains taxonomically complex due to morphological similarities and dioecious nature. Despite its medicinal value, Indian *Smilax* lacks modern taxonomic and phylogenetic revision. This study aims to clarify its taxonomy, phylogeny, and biogeography using morphological, molecular data, and DNA super barcodes. Extensive field surveys across Karnataka, Maharashtra, and Tamil Nadu led to the collection of multiple *Smilax* species for morphological and molecular analyses. Specimens were processed for herbarium deposition at Agharkar Herbarium at MACS. High-quality DNA was extracted, with amplification standardized for nuclear loci and sequencing is underway. Ecological niche modeling using MaxEnt and bioclimatic data revealed the Himalayas as a highly suitable habitat for

Smilax. Moreover, DNA sequencing was successfully completed for five loci in all collected *Smilax* species across India.

Systematic studies on the genus *Canscora* Lam. (Gentianaceae) in India



The genus *Canscora* Lam. (Gentianaceae) includes 14 species worldwide, with ten found in India (**Figure 2**). Despite its medicinal value, particularly *Canscora alata*, part of the *Shankpushpi* group, its taxonomy remains unresolved, lacking molecular validation since Thiv's 2003 work. This study aims to address taxonomic ambiguities by revisiting species classifications, examining floral anatomy (with a focus on androecium anisomorphy), and applying molecular tools to resolve species complexes and reassess the status of *Canscorinella*. These efforts seek to clarify the genus's systematic relationships and support future bioprospecting. Fieldwork across Maharashtra supported molecular studies involving DNA extraction, amplification, and sequencing. Ontogenetic analyses were also conducted to explore floral evolution.

Figure 2
Floral variations observed in *Canscora* spp.

Therapeutic investigations and isolation of bioactives from *Haplanthodes* species, the wild relatives of *Kalmegh*

The genus *Haplanthodes* Kuntze, belonging to the Acanthaceae family and closely related to *Andrographis* (Kalmegh), remains largely untapped for its bioprospecting potential despite being native to India. Extensive field surveys were conducted across Maharashtra for the collection of samples. Ethanolic extracts were prepared from all *Haplanthodes* taxa. Phytochemical screening was conducted using LC-MS and HPLC to identify and isolate bioactive compounds from *Haplanthodes* species, aiming to explore their therapeutic value and contribute to the scientific understanding of this underexplored genus.

Phytochemical and pharmacological investigations of some selected unexplored endemic species of Apiaceae family of Northern Western Ghats

The Apiaceae family includes about 240 species in India, many with culinary and medicinal uses. Though rich in aromatic compounds, most remain underexplored. This study focuses on identifying bioactive, non-toxic compounds from three lesser-known Apiaceae plants through extract analysis, bioactivity-guided fractionation, and phytoconstituent isolation. Essential oils extracted from *Pimpinella heyneana* seeds were characterized and their antimicrobial and antioxidant activities were evaluated. Essential oils from the seeds of *Heracleum grande* were isolated and processed for GC characterization. Additionally, phytochemical

extractions from the roots and stems of *H. grande* were sent for LC-NMR analysis and fingerprinting via HPTLC. Antimicrobial and antifungal assays have been completed, while anticancer activity analysis is in progress. These studies aim to uncover potential therapeutic applications of both plant species through detailed phytochemical and bioactivity profiling.

Utilising transcriptome data to gain insight into how hemiparasitic plants reduce rice yield

The aim is to understand the molecular mechanisms by which the hemiparasitic plant *Rhamphicarpa fistulosa* impacts rice yield. The primary objectives are to develop transcriptome profiles of *R. fistulosa* with selected host plants, and to analyse gene expression differences between infectious and non-infectious plant states. A comprehensive literature and herbarium survey, including visits to CNH revealed the ecological specificity of the species and morphological similarity to *Parasopubia*. Field collection (July–November 2024) targeted host-infected plants such as *Fimbrystylis*, *Xyris*, *Panicum* and others. Root tissues with haustoria were processed using liquid nitrogen and RNAlater for RNA isolation and microscopy. Due to the unavailability of a reference genome, whole genome sequencing (WGS) of *R. fistulosa* was initiated to enable accurate transcriptome assembly and annotation. This WGS data will facilitate de novo transcriptomic analysis and advance understanding of gene expression patterns contributing to parasitism and host yield reduction.

Sub-tribe Ischaeminae: Systematics and threat status assessment

Ischaeminae is the ecologically important subtribe that holds 44 taxa endemic to India, out of a total of 56 taxa known from the country. Ischaeminae is characterized by the fascicled inflorescence, paired spikelets-one sessile and other pedicelled, disarticulated rachis and each spikelet bearing two florets-one bisexual and the other staminate or neuter. The members of Ischaeminae are distributed across tropical regions of the world, with only six species of *Ischaemum* represented in the New World. Though important in terms of distribution, utility and endemism, the number of genera placed in Ischaeminae are of different opinions. To resolve this ambiguity, in the present studies we clarified phylogenetic relationships in subtribe Ischaeminae in India based on molecular as well as morphological datasets. Amplification and sequencing were carried out for ETS (50 taxa); trnL C-D (48 taxa) markers. Reinstatement of species *I. abrahamii* and *I. wayanadense* is suggested using molecular phylogenetic as well as morphological studies. Circumscriptions of incertae sedis genera, viz. *Sehima* Forssk., and *Thelepogon* Roth. was resolved and confirmed their placement in Ischaeminae. Further, assessment of five species of *Ischaemum* is carried out viz. *I. agharkarii, I. mangaluricum, I. impressum, I. kingii* & *I. bolei. I. agharkarii* was found to be endangered (EN) while *I. mangaluricum, I. impressum* and *I. kingii* were found to be least concerned (LC). Data is published on IUCN's Red List website.

Testing seed germination of *Tripogon lisboae* stapf. for desiccation tolerance in seeds and seedlings

Water stress has become an increasingly critical factor affecting plant survival, especially in the context of climate change. Desiccation tolerance (DT) is the survival strategy adopted by certain group of plant species that enables them to withstand extreme dehydration, often resulting in the loss of more than 90% of their cellular water content and recover upon rehydration during water availability without suffering any lethal damage.

Seeds and pollen of higher plants are usually desiccation tolerant, but their vegetative tissues are not. Only a few vascular plants have DT vegetative tissues that enable them to survive repeated cycles of desiccation and rehydration without loss of viability. It is not known whether all stages of the poikilohydric grass *Tripogon lisboae* exhibit DT. *T. lisboae* is a desiccation-tolerant grass species that comes under the subfamily Chloridoideae of family Poaceae. *T. lisboae* is found in the cliffs and rock outcrops of Northern Western Ghats, India.

In this study, seeds of *T. lisboae* were tested for their resurrection ability to understand whether DT is maintained across different life stages (**Figure 3**). Various plant growth hormones at different concentrations were applied to facilitate germination. For this species, different developmental stages after seed germination were desiccated under controlled conditions in environmental chamber, pots and trays. Resurrection ability was determined based on development after rehydration. In petri dishes, the coleoptile developed following radicle emergence in 10 days in the untreated condition and within 15 days in hormone treated conditions. But there was no growth observed in seeds sown in trays and pots. The seeds germinated in petri dishes were dehydrated and rehydrated. Upon rehydration they resumed growth within five days. In controlled conditions there is continuation in DT between the generative and vegetative stages. To further validate this, mesocosm experiments simulating the species natural habitat will be conducted to assess DT.

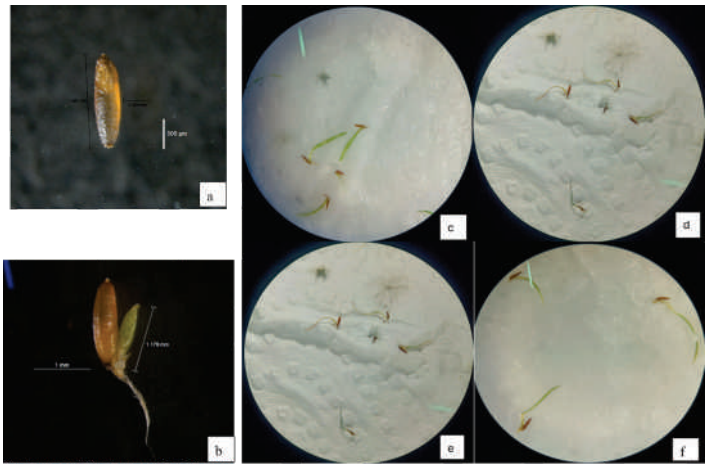


Figure 3
a) *Tripogon lisboae* seed; b) Coleoptile development; c) germinated seeds; d) dehydrated seedlings; e) rehydrated seedlings; f) resurrected seedlings

Floristic composition and plant functional type diversity of the basalt cliffs of Western Ghats, India

The basaltic cliffs of the Northern Western Ghats have always remained elusive from the ecological perspective. This particular research presents a first large-scale ecological study of the cliff vegetation in the Northern Western Ghats, focusing on species diversity and plant-environment interactions (**Figure 4**). A total of 231 vascular plant species were documented across 39 cliff sites and classified into nine plant functional types (PFTs). The vegetation was dominated by carnivorous species in abundance, while therophytes and graminoids had highest species richness. The study showed strong ecological filtering based on climatic variables, with temperature and precipitation emerging as primary environmental drivers. Altitude, more than latitude, substantially influenced species distribution, with stress-tolerant types dominating higher, drier sites and stress-avoidant types occurring in wetter, mid-elevation zones.

This research provides critical insight into the ecological structure of vertical rock outcrops, highlighting the unique adaptation strategies of cliff-dwelling plants. It highlights the role of microhabitat heterogeneity in supporting a wide array of functional traits and species including rare and endemic forms. Under the changing climate scenarios and increasing anthropogenic pressures, conserving these habitats is crucial. This study establishes a vital ecological baseline for studying NWG cliffs and supports the need for sustainable management and further functional and temporal studies to guide biodiversity conservation in these unique ecosystems.

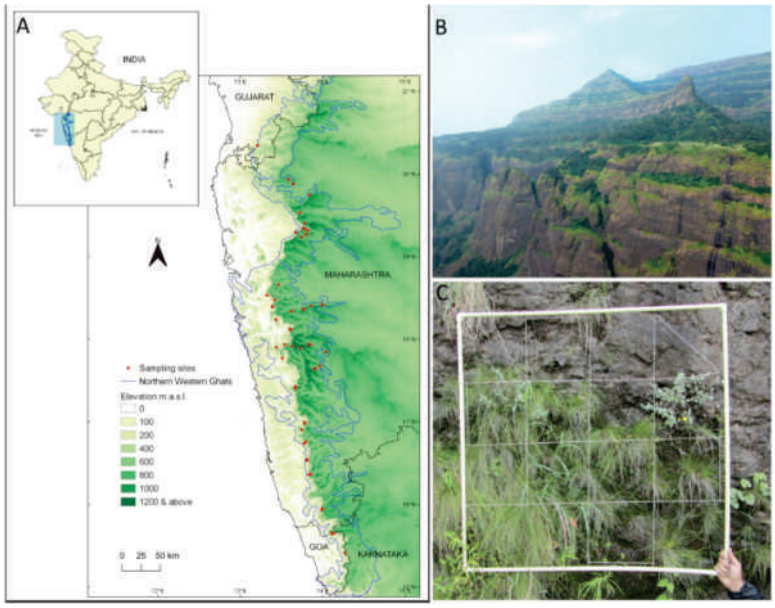


Figure 4
A: Map representing the study area and sampling points B: Basalt cliffs of Northern Western Ghats C: Image of 1 m**2** quadrat with 16 sub-quadrats used for vegetation sampling

Tracking climate and water clues: Diatom monitoring in Ladakh's high-altitude lakes

Diatoms serve as valuable proxy indicators for assessing environmental changes and ecological dynamics in various ecosystems. The Ladakh region of the Northwest Trans Himalaya, characterised by extreme semi-arid climatic conditions and large diurnal and seasonal temperature variations offers a unique setting for such studies. This region falls within the mid-latitude westerlies trough, and during intensified phases of the Indian Summer Monsoon (ISM), monsoonal effects are occasionally observed. These features make Ladakh an ideal natural laboratory to investigate both short- and long-term climatic and environmental changes. The fragile Trans-Himalayan landscape hosts a diverse range of aquatic habitats, including glacial-fed rivers, pristine glacial lakes, streams, hot springs, and several large brackish lakes. These ecosystems support a rich diversity of diatom communities, which are highly sensitive to changes in water chemistry and pollution levels.

Freshwater systems such as glacial lakes and streams are often dominated by unique diatom taxa like *Didymosphenia geminata*, *Cymbella* spp., *Sellaphora* spp., and *Lindavia* spp. In contrast, saline and brackish lakes frequently harbour species such as *Rhopalodia gibba, Hantzschia spp., Hannaea arcus,* and *Navicula spp.* (**Figure 5**).

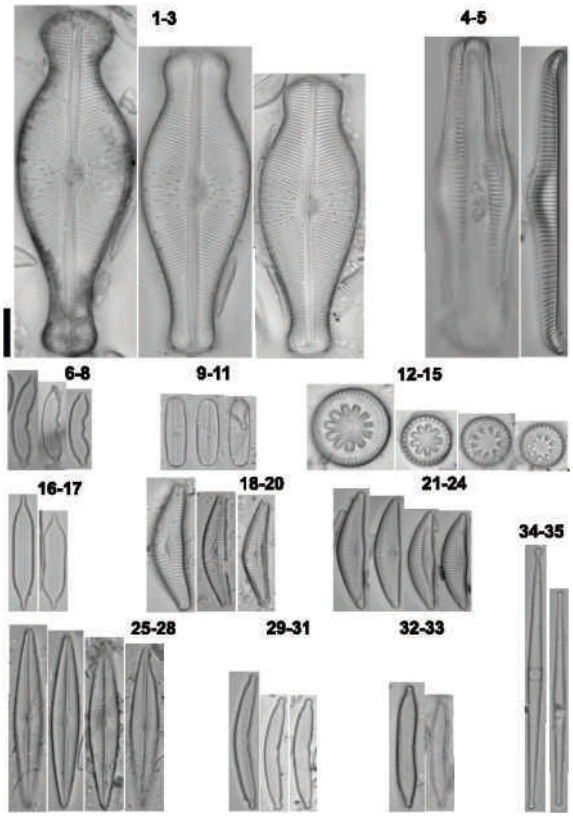


Figure 5
(1-3) *Didymosphenia geminata;* (4-5) *Rhopalodia gibba;* (6-8) *Hannaea* sp., (9-11) Sellaphora sp.; (12-15) *Lindavia* sp.; (16-17) *Pseudostaurosira* sp.; (18-20) *Cymbella sp.*; (21-24) *Cymbella* sp *2.*; (25-28) Navicula sp.; (29-31) *Hannaea arcus.*; (32-33) *Hantzschia* sp.; (34-35) *Ctenophora* sp. (Scale = 10µm)

The diatom samples were analysed using standard diatom preparation techniques and identified using light microscopy combined with basic physico-chemical water quality assessments to link ecological preferences with habitat conditions. The presence and diversity of diatoms not only reflect the current ecological status of these habitats but also help reconstruct past environmental and climatic changes. These insights are crucial for the sustainable management of fragile mountain ecosystems and align with national priorities related to Himalayan ecosystem resilience, biodiversity conservation, and climate adaptation.

Our work contributes valuable baseline data on high-altitude aquatic biodiversity and water quality.

Ecological patterns of moss-associated diatoms in Northeast India

In aerial habitats, such as moss-covered rocks and tree trunks, the mosses offer a favourable microenvironment that supports distinct diatom communities. However, the ecological drivers influencing their distribution in such habitats remain underexplored, especially in regions like Northeast India that are both topographically complex and ecologically sensitive.

This study investigated the composition and environmental associations of moss-associated (pseudoaerial) diatom communities in the Eastern Himalayas, with a focus on water chemistry and elevation. Out of 191 collected samples, 53 were selected for detailed analysis using standard diatom preparation and light microscopy techniques. These yielded 341 diatom species across 59 genera. Dominant taxa included *Achnanthidium minutissimum*, *Adlafia sinensis*, *Achnanthidium subhudsonis*, *Humidophila delognei*, *Psammothidium hustedtii*, and *Odontidium mesodon*.

Water chemistry patterns across the northern and southern Brahmaputra regions were broadly similar, although sites in the north showed slightly greater variability. Altitude emerged as the primary structuring factor in the north, while electrical conductivity and phosphate levels were more influential in the south (Figure 3). Among all measured parameters, electrical conductivity exhibited the strongest correlation with species diversity.

Canonical Correspondence Analysis (CCA) further indicated the presence of pollution-tolerant species such as *Cocconeis placentula*, *Sellaphora nigri* and *Sellaphora saugerresii* at sites likely affected by anthropogenic disturbance. Overall, differences in community composition were better explained by environmental gradients and elevation than by geographic distance.

This study provides the first comprehensive ecological description of moss-associated diatom communities in Northeast India. It offers valuable baseline data and identifies potential indicators and endemic taxa, laying the foundation for region-specific bioassessment tools to support ecological monitoring and conservation planning in the Eastern Himalayas. These results also contribute to national efforts to document Himalayan biodiversity and develop ecological indicators for climate-sensitive regions. Future work will explore seasonal dynamics and the molecular characterisation of key taxa to strengthen species identification and monitoring frameworks.

Ancient pots, modern insights: Diatom analysis reveals Iron Age environments in Tamil Nadu

Archaeology reconstructs human cultural history through the study of material remains. While traditional investigations focus on artefacts created, modified or used by humans, the biological traces embedded in these materials such as diatoms are often overlooked. Yet, these microscopic algae can offer critical insights into past environmental conditions.

This study examined diatom assemblages from 26 ancient pottery sherds excavated at six Iron Age archaeological sites in the lower Kaveri River Basin, Tamil Nadu (**Figure 6**). Conducted in collaboration with archaeological partners, it represents one of the first attempts in tropical Asia to apply diatom analysis directly

to pottery. A total of 78 samples were analysed using standard cleaning and mounting techniques for light microscopy, yielding 41 diatom taxa—mainly freshwater or desiccation-tolerant genera such as *Nitzschia* Hassall, *Hantzschia* Grunow, *Luticola* D.G. Mann, *Stauroneis* Ehrenberg, and *Tryblionella* W. Smith.

The dominant genera were *Nitzschia* (70.73%), *Hantzschia* (21.95%) and *Luticola* (4.87%). *Nitzschia* occurred across all sites, while *Luticola* and *Hantzschia* were restricted to two. The assemblages were primarily composed of freshwater species, along with a few terrestrial and desiccation-tolerant forms, suggesting that the clay used for pottery likely originated from freshwater environments. The presence of certain diatom species in many sherds—potentially linked to agricultural or domestic water use—provides further clues into ancient cultural practices and resource use.

This pioneering study highlights the untapped potential of diatom analysis in South Asian archaeology and contributes a new line of evidence for reconstructing ancient ecosystems in regions where sediment cores are unavailable. It also aligns with our institute's commitment to interdisciplinary research at the interface of ecology, heritage science, and environmental history. Future work will explore applying this approach across diverse archaeological contexts in India to better understand past human-environment interactions.

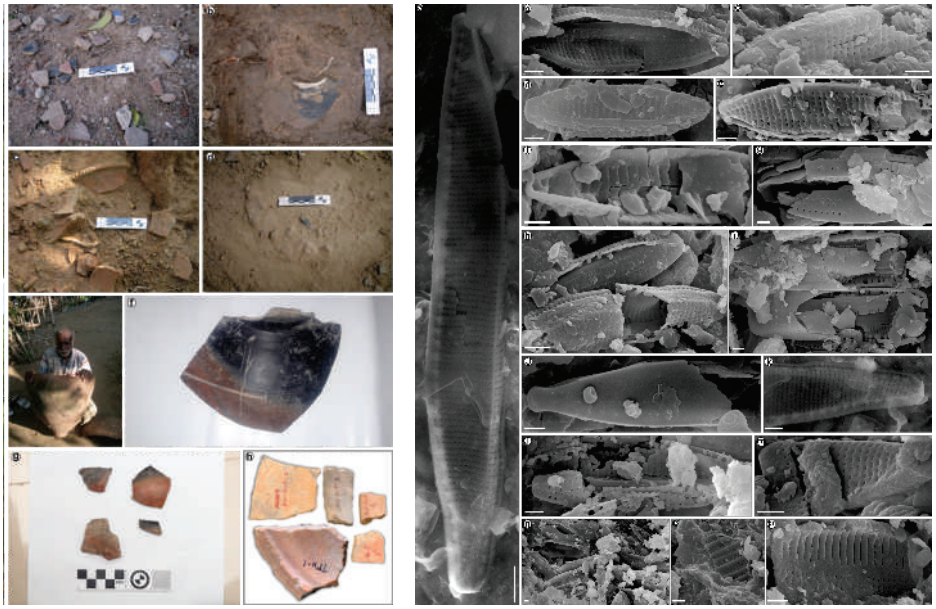


Figure 6
(left) Pottery sherds from the lower Kaveri River Basin, Tamil Nadu; (r) Dominant diatom taxa recorded from the pottery sherds across various sites of the lower Kaveri River Basin

Western Ghats Endemic Diatom Index: A new tool for monitoring stream health

The Western Ghats, a global biodiversity hotspot, are increasingly under threat from anthropogenic pressures. To support effective ecological monitoring and conservation, we have developed the Western Ghats Endemic Diatom Index (WGEDI)—a novel biomonitoring tool designed to assess the health of streams and rivers across this sensitive mountain range.

This index is based on diatoms, microscopic algae with silica shells, which are known for their rapid and measurable responses to changes in water quality. Unlike conventional approaches that rely on globally distributed species, WGEDI specifically focuses on diatom species endemic to the Western Ghats. These regional taxa offer greater sensitivity and ecological precision in detecting environmental degradation.

We analysed 524 diatom species across various habitat conditions—335 endemic and 189 cosmopolitans. Results showed that endemic species are strongly associated with clean, undisturbed waters and decline with increasing pollution, whereas cosmopolitan species tend to be more tolerant. Notably, 25.7% of endemic species showed peak abundance under pristine conditions, compared to only 8.5% of cosmopolitan taxa.

The index was applied to 139 stream sites across the Western Ghats using standard diatom preparation techniques and water quality assessments. Results indicated that only 40% of sites retained good to excellent water quality, while 60% fell into moderate to poor categories. Statistical analysis revealed a clear decline in index scores from pristine to heavily impacted sites, confirming the reliability of WGEDI in capturing ecological gradients.

WGEDI offers a distinct advantage over traditional chemical-based monitoring by integrating the cumulative and long-term effects of multiple stressors on aquatic ecosystems. This tool equips water resource managers with a cost-effective and scientifically grounded method to detect pollution and assess ecosystem health.

This effort contributes to India's broader environmental monitoring goals and supports conservation planning in the Western Ghats. Future work will focus on adapting the index to other peninsular river systems and establishing standardised protocols to ensure wide-scale applicability and policy integration.

Long-term spatiotemporal monitoring of water quality in a tropical river: A case study of the Mula-Mutha river basin

Rivers are vital freshwater resources that sustain biodiversity, support livelihoods, and maintain ecological balance. Regular and long-term monitoring of river water quality—both across space and over time—is increasingly necessary to understand the pressures facing these ecosystems and to support evidence-based management.

The Mula-Mutha River Basin, part of the Western Ghats region in Peninsular India, was selected for a long-term assessment of water quality dynamics. A total of 162 water samples were collected from 19 sites representing upstream, midstream, and downstream stretches of the river. Sampling was conducted during the pre-monsoon, monsoon, and post-monsoon periods across three consecutive years: 2022, 2023, and 2024. Parameters measured included major ions (Ca^{2+}, Mg^{2+}, Na^{+}, K^{+}, SO_4^{2-}, Cl^{-}, NO_3^{-}, No_2^{-}), along with water temperature, pH, electrical conductivity (EC), total dissolved solids (TDS), and dissolved oxygen (DO), using standard field and laboratory protocols.

Chloride was selected as a representative ion to interpret spatiotemporal variability. Seasonal analysis showed a clear pattern, with higher chloride concentrations during the pre-monsoon and post-monsoon period and lower levels during the monsoon, likely due to reduced river flow and increased evaporation. Year-wise comparison revealed elevated chloride levels in 2023 compared to 2022 and 2024. This trend could be attributed to increased anthropogenic inputs, such as wastewater discharge, agricultural runoff, and industrial effluents, or to reduced rainfall and dilution in 2023.

Spatial patterns showed marked variation among sites. For instance, the downstream stretch of the river recorded consistently high chloride levels, indicating a strong influence from urban wastewater.

This research demonstrates the need for long-term, site-specific, and seasonally resolved monitoring to understand the combined impact of hydrological processes and human activities on river systems. Continued monitoring of additional parameters across the basin will further enhance our comprehension of ecological health and the dynamics of pollution. This effort contributes to the scientific foundation required for designing targeted river restoration strategies and managing urban freshwater resources in a rapidly expanding metropolitan region like Pune.

Palaeobiology

Micro-miners of Rajapuri creek, Raigad: New species of marine monothalamid, accumulating titaniferous minerals discovered along West coast of Maharashtra.

Here we report the discovery and formal description of two new benthic monothalamous foraminiferal species—*Psammophaga holzmannae* sp. nov., and *Psammophaga sinhai* sp. nov., from Rajapuri Creek, Maharashtra, situated along the Arabian Sea coast (**Figure 7**).

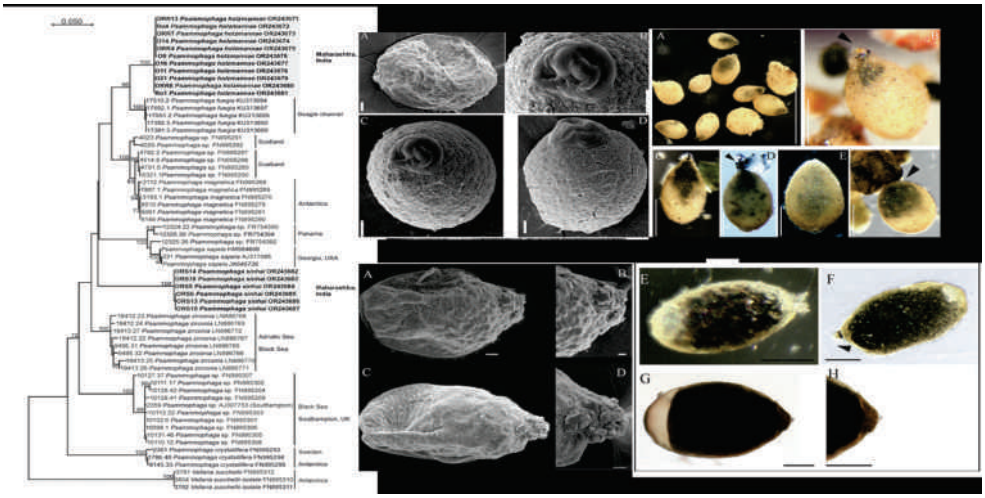


Figure 7
Collection of *Psammophaga* (Foraminifera) from coastal region of Maharashtra

Both species feature agglutinated tests composed of fine clay particles, a single aperture, and discernible differences in size, shape, and cytoplasmic coloration. *P. holzmannae* (103–246 µm) is ovoid-to-spherical with translucent-to-orange cytoplasm and shows a concentration of ingested mineral grains near its aperture. In contrast, *P. sinhai* (279–448 µm) has an oblong-to-droplet shape, yellow-olive cytoplasm, and a more uniform distribution of particles throughout the test. Molecular analyses of partial small subunit (SSU) rRNA genes position both species within Clade E of monothalamids, clearly distinct from previously known *Psammophaga* lineages. Additionally, SEM-EDS (scanning-electron microscopy coupled with energy dispersive spectroscopy) reveals selective phagocytosis of titaniferous minerals, indicating these protists preferentially incorporate heavy opaque grains from their sedimentary surroundings. This research enriches our understanding of tropical monothalamous foraminifera diversity an understudied group by integrating detailed morphological description with molecular phylogeny and elemental composition. The findings underscore the ecological sophistication of these organisms and their potential role in benthic mineral cycling along the Indian coast.

Bioenergy

The bioenergy group leverages the potential of extremophilic microbes to generate clean energy and manage waste sustainably. By utilizing microbial cultures preserved at the MACS Collection of Microorganisms (MCM), we have developed processes for controlling microbially induced corrosion (MIC) caused by Sulphate Reducing Bacteria (SRB) in the oil and gas industry. Similarly, thermophilic anaerobic bacteria collected from Indian hot springs were explored for their lignocellulolytic capabilities at high temperatures for biofuel production from agricultural biomass. A DRDO-NMRL sponsored project was initiated to explore biohydrogen production from organic waste using psychrophilic to thermophilic microbial strains. A large-scale demonstration facility for bioenergy generation was also developed. The potential benefits of MCM bioresources as probiotics in human health were also studied.

A state-of-the-art two-stage biohydrogen (1000 L) and biomethane (2000 L) production facility was established at ARI Campus to support the integrated conversion of lignocellulosic biomass into clean bioenergy (**Figure 8**). The facility includes three 100 L vessels and one 300 L pretreatment vessel for substrate preparation. A shredder-cum-pulverizer is used to reduce the feedstock size for efficient digestion. The lignocellulosic material is then processed in a 1000 L biohydrogen reactor and a 2000 L biomethane reactor to produce clean, renewable fuels. For post-processing, a solid-liquid separator and decanter centrifuge ensure efficient phase separation, while a fully automatic organic composter manages residual biomass, supporting circular economy principles. The facility also provides precise control of temperature and other process parameters. Real-time monitoring and automation are enabled through advanced PLC-SCADA software. This pilot-scale system is designed to serve as a scalable and replicable model for decentralized bioenergy production from agricultural and lignocellulosic waste, which are key priorities outlined in the National Bio-Energy Mission, Swachh Bharat Mission, and Atmanirbhar Bharat Abhiyan.

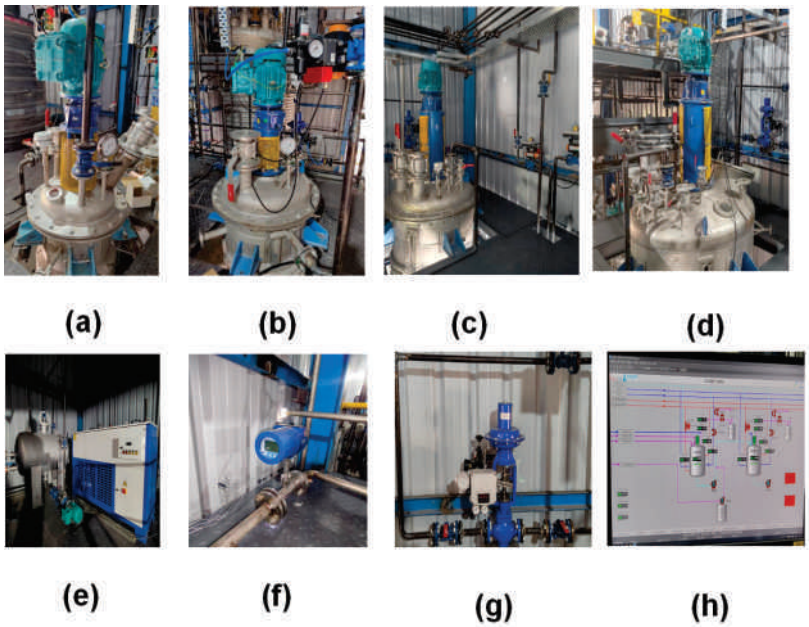


Figure 8
Two-stage biohydrogen (1000 L) and biomethane (2000 L) production facility

The putative probiotic strains *Bacillus coagulans* and *Limosilactobacillus reuteri* were assessed for various probiotic traits. *L. reuteri* showed superior gastric tolerance, with 83.7% survival in simulated gastric fluid (SGF) after 120 minutes, compared to 34.2% for *B. coagulans. L. reuteri* demonstrated strong antagonistic activity against pathogens (17-43.5 mm inhibition zones), while *B. coagulans* showed no inhibition. *B. coagulans* produced more EPS (1 ± 0.07 g/L) and exhibited higher antioxidant activity (DPPH 87.58%, ABTS 26.13%) than L. reuteri (41.72%, 19.36%). *L. reuteri* had greater adhesion and pathogen exclusion, while *B. coagulans* showed higher cholesterol assimilation and SCFA production.

Research from the bioenergy group demonstrated an effective bacteriophage formulation which inhibits SRB-induced corrosion and shows strong potential for protecting pipelines in oilfield production environments. Research on thermophilic and psychrophilic bacteria contributes substantially to India's bioenergy research landscape by providing a diverse repository of novel strains with potential applications in consolidated bioprocessing, thermophilic anaerobic digestion and low temperature biohydrogen production systems. The demonstration facility for Bioenergy Generation is a practical, technology-driven solution for reducing fossil fuel dependence and enhancing energy security. *L. reuteri* and *B. coagulans* demonstrated strong potential as probiotic for gut health, and metabolic and cardiovascular benefits, respectively. Overall, our studies underscore the biotechnological potential of extremophiles from indigenous environments in promoting sustainable energy innovation, human health, resource preservation, and bioeconomy development under India's BioE3 policy framework.

Bioprospecting

Antioxidant potential of endophytic fungi

Using GC–MS profiling, a range of bioactive compounds such as pentadecanoic acid, 1,4-dibutyl benzene-1,4-dicarboxylate, and octadecanoic acid were detected. These metabolites are associated with antimicrobial, antioxidant, and anti-inflammatory effects. The similarity in metabolite profiles between host and endophyte suggests a mutualistic biochemical relationship. Altogether, this research demonstrates the potential of grass-associated endophytes as natural sources of pharmacologically active compounds and offers a promising route for developing sustainable antifungal and antioxidant solutions in agriculture and medicine.

Studies and screening of alkaline protease production potential of fungi

Most soil fungi grow in acid environments; however, some of them can grow in alkaline conditions which are used in development of biotechnological processes. Saprobic fungi have an enormous dispersal potential and an efficient enzymatic system that guarantees their biological role. They can degrade a great variety of carbon sources from plants tissues, and their decomposing activity is essential for the redistribution of nutrients in the soil. Several alkali-tolerant fungi that are found in variety of soils have been isolated *in-vitro* and screened for their alkaline protease activity. Many of the fungal strains analyzed and have the capacity of producing alkaline protease enzyme at high pH levels which may be significant for industrial applications.

Studies on minimum inhibitory concentration (MIC) and GC-MS chromatogram of volatile bioactive compounds of the endophytic Streptomyces isolates

Antimicrobial and MIC of crude extract of different *Streptomyces* spp. have been done. The extract of *Streptomyces albidoflavus* isolated from *Nardostachys jatamansi* showed promising results against *Pseudomonas aeruginosa* MTCC 2453. The MIC of the crude extract of *Streptomyces* was found to be all the dilutions. The extract did not show any antimicrobial activity against *Escherichia coli* MTCC-739, *Bacillus subtilis* MTCC-121, *Staphylococcus aureus* subsp. *aureus* MTCC-1430, *Pseudomonas aeruginosa* MCM-B-1290, *Bacillus putida* MCM-B-1261.

The GC–MS analysis of the extract from all *Streptomyces* showed a very strong antimicrobial activity. 20 different volatile compounds identified in the active metabolite of the isolate (between 11.3 and 56.16 min) and recognized for their antimicrobial, antifungal, anti-tuberculosis, antioxidant, antitumor activities. Hexahydro-3-(1-methylpropyl) pyrrolo [1,2-a]pyrazine-1,4-dione, Pyrrolo [1, 2-a]pyrazine-1,4-dione, hexahydro-3-(2-methylpropyl)-, n-Nonadecanol-1, n-Nonadecanol-1,7,9-Di-tert-butyl-1-oxaspiro(4,5)deca-6,9-diene-2,8-dione, 9-Octadecenoic acid, methyl ester, Hexahydro-3-(1-methylpropyl) pyrrolo[1,2-a]pyrazine-1,4-dione, n-Pentadecanol, Phenol, 2,5-bis(1,1-dimethylethyl)-, Heneicosane and Eicosane, were

the main compounds identified from the extract. GC-MS chromatogram of *S. albidoflavus* isolated from *Nardostachys jatamansi*.

Worldwide, cardiovascular diseases (CVDs) are the leading cause of death and require treatment and prevention. Lichens are symbiotic organisms that are known to produce unique secondary metabolites and have been used as folk medicines. The aim of the study was to emphasize the importance of lichens in improving heart health, with the objective of investigating protocetraric acid, a lichen metabolite, for its antioxidant and cardioprotective potential by using in vitro and in silico techniques. Protocetraric acid (PRC) was isolated, characterized, and tested for antioxidant properties using six assays. In cardiovascular investigations, hydroxymethylglutaryl-coenzymeA reductase (HMGCR), angiotensin-converting enzyme inhibitory, and fibrinolytic capacities, along with enzyme inhibitory kinetics studies, were carried out.

In silico toxicology and molecular docking analysis were done to determine the binding sites on target proteins. The cytoprotective ability of Protocetraric acid (PRC) was evaluated by H_2O_2-induced toxicity in H9c2 rat heart cells. Out of six lichens, the extract of *Flaoparmelia caperata* showed comparatively stronger antioxidant activity in terms of 1,1-diphenyl-2-picryl hydrazil (DPPH), scavenging of nitric oxide (SNO), and ferric reducing potential (FRAP) equivalent values. PRC showed significant antioxidant properties, and with respect to cardiovascular studies, PRC exhibited 86% HMGCR and 82% ACE inhibition, while 57% fibrinolysis at 320 µM concentration. Inhibitory kinetic tests of PRC showed competitive and uncompetitive HMGCR and ACE inhibition types respectively. PRC showed minimum binding energies of (−)7.9, (−)8.9, and (−)9.0 kcal/mol with 1HWK, 1O8A, and 4BZS. The H9c2 cell line pre-treated with PRC was found to reduce H_2O_2 toxicity as well as increase cell viability. Protocetraric acid is a potent compound that has been experimentally shown to have hypocholesterolemic, hypotensive, and cardioprotective properties for treating cardiovascular diseases.

Effect of *Crinum woodrowii* in animal model of Alzheimer's disease

Crinum woodrowii Baker (CW) is a bulbous plant belonging to Amaryllidaceae family. CW is used in many Indigenous formulations of the traditional medicinal system of India. Phytochemical screening of CW bulb extracts has shown several phytoconstituents, including alkaloids. Galantamine, is an important alkaloid from the Amaryllidaceae family with well-known neuropharmacological effects through selective,long-lasting, and competitive inhibition of the AChE. Many parts of CW showed efficacy against neurological and inflammatory conditions with the characteristic improvement of the cognitive functions. Alzheimer's disease (AD) is a complex neurodegenerative disease affecting mental ability and neurocognitive functions that affects millions of people, thus presenting a significant clinical challenge to the world. Phytochemical profiling of CW showed presence of galantamine, an alkaloid used for the treatment of dementia, therefore during this report period, we have carried out *in-vivo* assays to find out the efficacy of CW against AD. *In-vivo* assessment of acute toxicity of CW extract was carried out in Wistar rats at 2000mg/kg. The study revealed no behavioural or serum parameter alterations (albumin, creatinine, ALP, SGPT, SGOT). A histopathological analysis was done using Hematoxylin and Eosin (H&E) staining to evaluate safety further. No pathological changes were observed in the brain, stomach, kidney, spleen, or heart tissue compared to controls. Further Memory impairment studies were carried out in Swiss albino mice by using scopolamine-induced memory impairment model. Extract administration showed improved memory function in animals. We have carried out the Y-Maze Test to assess spatial working memory, Novel Object Recognition for recognition memory, and the Morris Water Maze for spatial learning and memory. Our investigation found that extract treatment improved performance in these tasks compared to the scopolamine-treated group.

Neuroprotective effect of CW extract on brain tissues of the hippocampal and cerebral region was studied by histopathology of brain tissue. (**Figure 9**). Microscopic examination of the brain tissue of control group on day 14 showed no abnormality of pathological significance (**Figure 9** Control Group) However, compared to control group, the disease group showed severe multifocal apoptotic, pyknotic, necrotic, and degenerated neurons in the hippocampus regions. In the cerebral section, multifocal neuronal degenerated, shrunken neurons, reduced neuronal density, and gliosis in the cerebral cortex were also observed for the disease group (**Figure 9** Scopolamine disease group). The severity and incidence of histological abnormalities were alleviated with a different dose of extracts than the disease group eosin staining of the hippocampus of the extract-treated animals showed regular hippocampal regions with a prominent nucleus and uniform morphology (**Figure 9** CW 400 mg/kg Group). It could be concluded that the extract treatment restores the neuronal structure and protects the neurons from scopolamine-induced damage. These results would be helpful for further assessment of the neuroprotective potential of phytochemicals belonging to the family Amaryllidaceae.

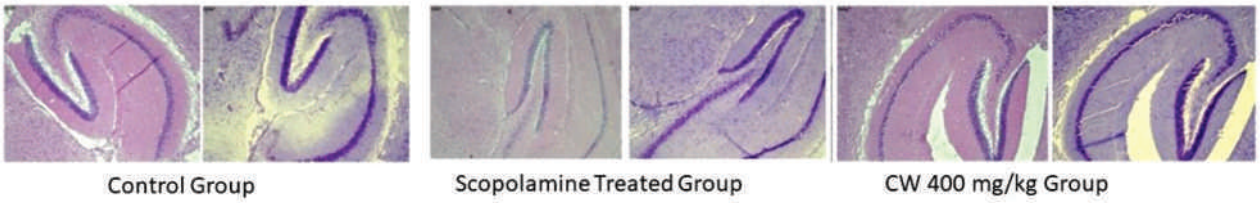


Figure 9
Neuroprotective effect of CW extract on brain tissues of the hippocampal and cerebral region in experimental animals

Bioprospecting of lichens for assessing the environmental impact level due to quarrying and mining and taxonomic studies of the lichen outcrops of the Northwestern ghats

The base line taxonomic data has been procured through collections at various high level ferricretes and basalt mesa from the Northwestern ghats of Maharashtra. This has further resulted into a publication with new records to India. Paper deals with an addition of ten new lichen records from the plateaus of the Northwestern ghats of India. The following ten species are distributed in six genera. *Caloplaca thracopontica* Vondrák & Šoun and *Endocarpon pseudosubnitescens* Breuss are two new records to India, while *Caloplaca cupulifera* (Vain.) Zahlbr., *Chrysothrix chlorina* (Ach.) J. R. Laundon, *Diploschistes actinostomus* (Pers. Ex. Ach) Zahlbr., and *Lichinella flexa* Henssen, Büdel & T.H. Nash are four new records to Maharashtra state. Four species are re-recorded from the state after a lapse of about fifty years, specifically from the plateaus in the Northern Western Ghats of Maharashtra namely, *Collema conglomeratum* Hoffm. var. crassiusculum (Malme) Degel., *Collema leptaleum* Tuck. var. biliosum (Mont.) Degel., *Diploschistes scruposus* (Schreb.) Norman, and *Endocarpon pusillum* Hedw (**Figure 10**). Further Rock outcrops studies outside India include Inselburgs, durricrust, limestone and quartzite, calcareous, sandstone table mountains and ferricretes where vegetation studies are known. Literature survey shows studies on mineral weathering, biomonitoring, metalliferous habitats, adaptation and interactions with saxicolous lichens with metals, ammonia absorbing lichens and heavy metal deposition and also conservation strategies. In India, lichen studies focus on air pollution, heavy metal accumulation, and biodiversity loss. However, specialized outcrops lack extensive studies, with only floristic and ecology data available. A recent study on 13 lichen species from Maharashtra plateau outcrops analyzed their heavy metal contents using an ICP-MS. To conclude, Panchgani plateau exhibits high heavy metal values, including Pb, Cd, Cr, and Fe, Al, Zn, and Cu. While Sinhagad locality has high Ni, Kas plateau has highest Mn in *Peltula polyphylla*, *P. austrosinense* high in Pb, Cd, and Cu and *L. javanicum* with high Cr, Fe, Al and Zn.

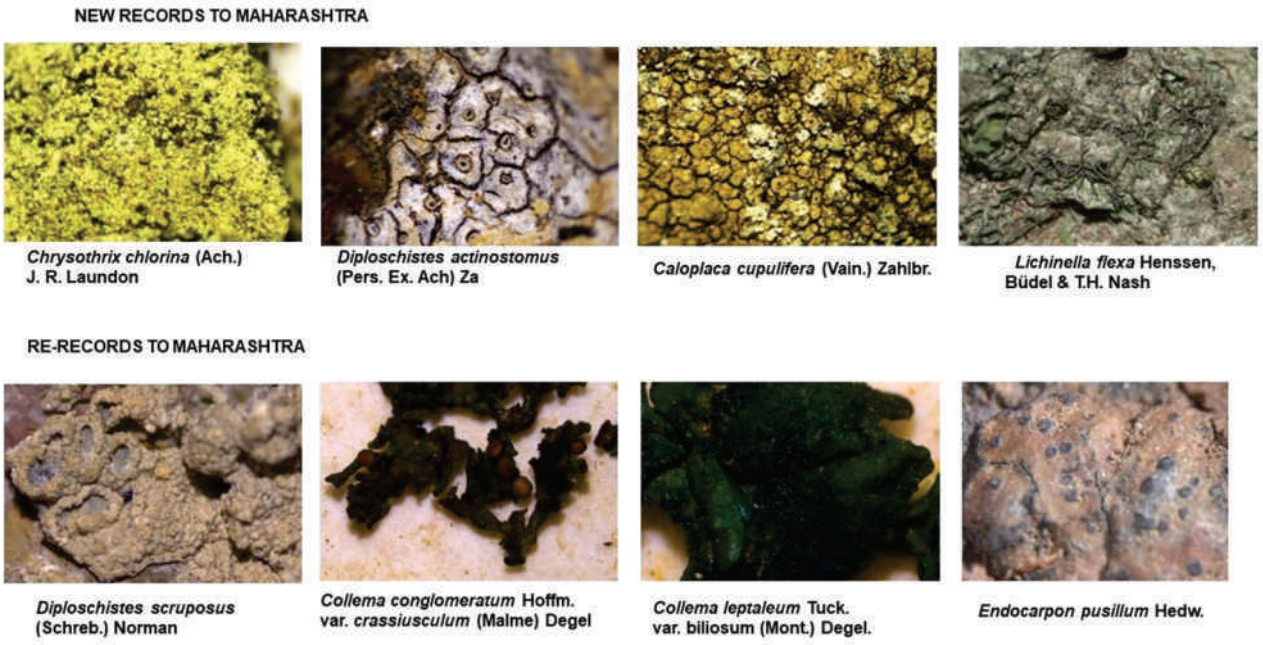


Figure 10
New lichen records from the plateaus of the Northwestern ghats of India

Isolation of Lupeol from *Crataeva nurvala*

Medicinal plant *Crataeva nurvala* Buch. Ham., belongs to the Capparidaceae family and is widely distributed in India and tropical and subtropical parts of the world (**Figure 11**). It is considered as a sacred plant and is known as Varuna. Ethnobotany supports its significance in both religious and traditional Ayurvedic practices. Traditionally, it has been used for its folkloric use in various disorders such as blood purifier, breathing problems, fever, metabolic disorders, wound healing, memory loss, and weak immune system.

Figure 11
Crateva nurvala plant

Lupeol was isolated from the hexane extract of bark, and it is characterized by RT in HPLC, TLC with standard, FTIR and LC-MS spectra obtained from LC-MS/MS-QTRAP. LC-MS spectrum was obtained using APCI probe in positive ionization mode with a collision energy of 30V and collision energy spread of 10V. The spectra showed parent ion of m/z $[M+H]^+$ 427.14.

Isolation of Umbelliferone from *Evolvulus alsinoides*

Figure 12 *Evolvulus alsinoides*

Shankhapushpi is famous for morning glory and has conch shaped flower, which resembles shankh, hence name given Shankpushpi. Traditionally, it is used in Ayurvedic formulation for memory booster, reducing anxiety, stress and considered as a powerful medicine for the treatment of neurological disorders. Its botanical name is *Evolvulus alsinoides* and now as *Convolvulus prostrates* and belongs to family Convolvulaceae (**Figure 12**). *E. alsinoides* is an annual or perennial blooming herbaceous plant. The phytochemicals present in *E. alsinoides* comprise different class such as flavonoid, flavonoid-glycosides, lipids, fatty acids, umbelliferone, scopoletin, butanetetrol, and scopolin. Umbelliferone has been isolated and characterized as 7-hydroxycoumarin. Its HPLC and TLC profile developed. FTIR and LC-MS spectra have been recorded. It is orange colored solid.

Anthocyanins from *Carissa spinarum*

Among polyphenols, anthocyanin is an interesting water-soluble compound that plays a very vital role in imparting colour to fruits, vegetables and flowers. They appear red in acidic medium and blue in alkaline medium. Fruits are considered as predominant source of anthocyanins contributing upto 70% of daily intake. On recognizing the potential pharmacological benefits of anthocyanins against diabetes, cancer, cardiovascular diseases, the consumption and regular intake of fruits is a crucial aspect of healthy lifestyle. Despite this fact, maintaining stability of anthocyanins is a challenging situation. So, improved extraction and stability methods should be developed that foster the preventable approach in treating various health issues, food and beverage industry. Exploration of fruits with an abundance of bioactive compounds especially anthocyanins. Extraction of *Carissa spinarum* fruits for anthocyanins using ultrasound-assisted technique at different temperatures (30 & 45 °C) with varying time (20 & 30 mn) was performed (**Figure 13**). The crude ethanolic extract was further analysis via LCMS/MS technique. LCMS/MS data revealed the presence of cyanidin (m/z 287.1), peonidin (m/z 301.06) in seed, petunidin-3-glucoside (m/z 479.26) in seed and pulp extract obtained from Ultrasound assisted technique. Other analytes detected were fisetinidin (m/z 271.10), scopoletin (m/z 193.02), hexamethylcyclotrisiloxane (m/z 223.09), hyodeoxycholic acid (m/z 393.31) in seed part. In seed, two pentacyclic triterpenoids namely madecassic acid (m/z 504.43) and maslinic acid (m/z 472.46), an isoflavone tectoridin (m/z 462.16), vitexin (m/z 432.21) and some fatty acids were found. Whereas some compounds like oleanolic acid (m/z 456.28), chlorogenic acid (m/z 354.04), hederagenin (m/z 472.00), xipamide (m/z 353.80) were detected in seed as well as pulp. In pulp salicin (m/z 572.40), saluamine (m/z 250.22) pyridinium derivative & hydroxy-ketone product, kaempferol (m/z 286.15) were detected.

Figure 13 *Carissa spinarum*

Developmental Biology

Elucidating signaling mechanisms regulating glial morphogenesis and formation of the blood-brain-barrier

We study cellular and signaling mechanisms underlying glial morphogenesis, synaptic plasticity and inter-organ signaling. We combine genetics with molecular biology and imaging in our studies. The current focus is on understanding the role of the secreted ligand Folded gastrulation (Fog) in regulating morphology of subperineurial glia (SPG) and formation of the blood-brain-barrier. We have generated a line in which Fog is endogenously tagged with sfGFP line (Fog::sfGFP). Characterization of this line together with other *fog* enhancer reporters, reveals Fog expression in different subtypes of glia in the embryonic CNS (**Figure 14**). In the larval brain, GFP signal was detected in the SPGs. Interestingly, we also observed expression in the primordial germ cells /pole cells in the embryo which gives rise to the gonads that has not been reported previously. Consistent with this, in adult females we detected enriched expression in terminal filament cells and other somatic cells. We are currently testing whether this reagent can be used to elucidate ligand-receptor interactions.

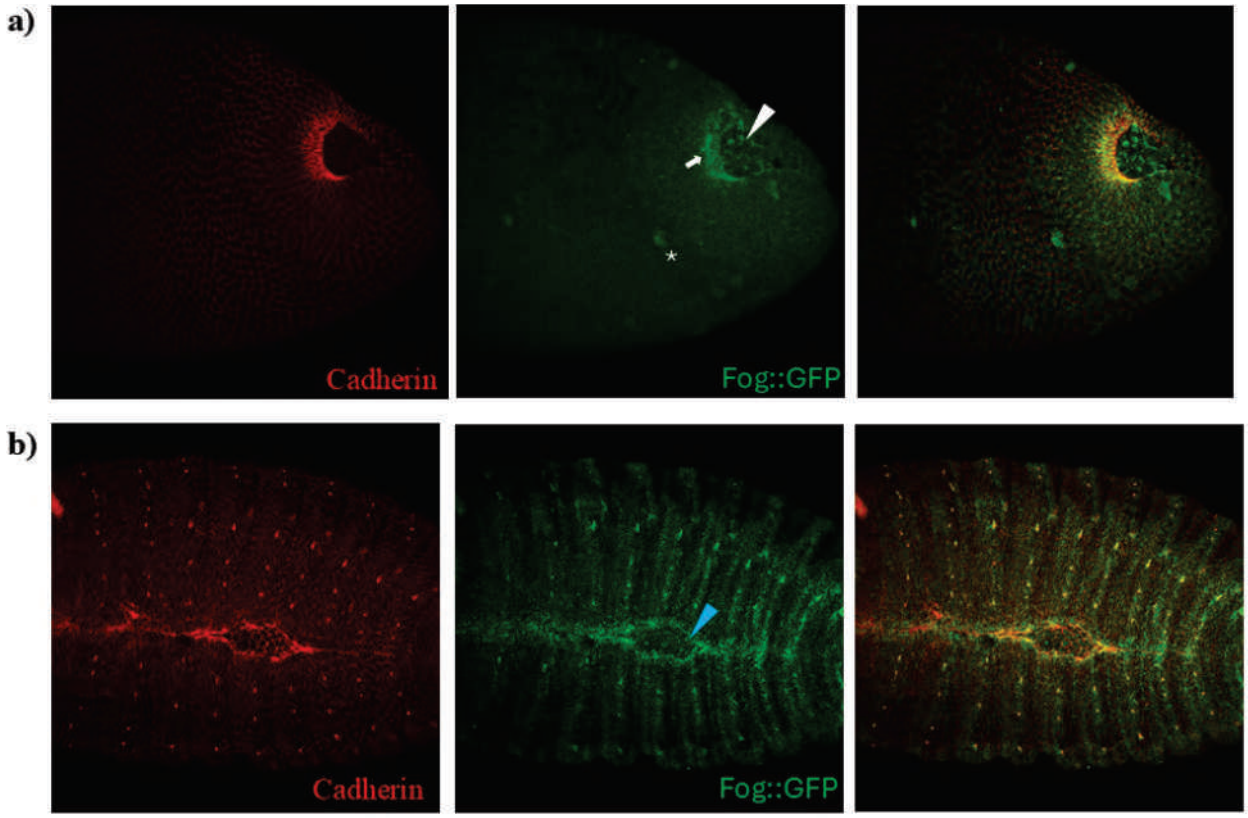


Figure 14
Characterization of Fog::sfGFP expression during embryonic development

Extracellular matrix protein Nephronectin is required for vasculogenesis and is sufficient to promote in vitro vessel formation

Vascularization is essential for both organ development and the engineering of functional thick tissues, yet the mechanisms guiding vessel formation remain incompletely understood. In this study, we identify the extracellular matrix protein nephronectin as a critical regulator of vascular development in zebrafish and a promoter of mammalian angiogenesis. Loss of nephronectin impairs axial vein sprouting and posterior intersegmental vessel growth and similarly disrupts vessel maturation during adult fin regeneration. Nephronectin colocalizes with angiogenesis-related integrins ITGAV and ITGB3.1, binds directly to the ITGAV/ITGB3.1 complex, and its functional loss phenocopies that of ITGAV. In mammalian systems, nephronectin enhances endothelial cell migration, tube formation, and vascular network formation in both 2D and 3D cultures, and amplifies VEGF-induced capillary interconnectivity, diameter, and stability. These findings establish nephronectin as a proangiogenic factor with potential applications in improving vascularization for tissue engineering.

Autophagy differentially regulates germline stem cell maintenance through niche cells rather than cell-autonomous mechanisms

Autophagy plays distinct roles in maintaining germline stem cells (GSCs) and their niche microenvironment, as revealed by our study using Drosophila ovaries. While GSCs exhibit low basal autophagy flux dependent on the core autophagy gene Atg5, we found that autophagy is surprisingly dispensable for GSC maintenance within the niche. However, autophagy proves critical for supporting cap cells (the key niche component), where its disruption leads to age-dependent loss of both cap cells and GSCs, along with severe impairment of the essential BMP-pMad signaling pathway that maintains GSC self-renewal capacity, particularly during aging.

Our findings demonstrate that autophagy serves a differential role in the stem cell niche - while not required in GSCs themselves, it is essential for niche cell survival and function. Using genetic tools and advanced imaging in the Drosophila model, we showed that autophagy-deficient cap cells fail to maintain the BMP-pMad signaling necessary for GSC maintenance. This work provides novel insights into how niche-specific cellular quality control mechanisms support stem cell populations over time, with autophagy acting as a crucial maintenance factor specifically for the supportive niche cells rather than the stem cells they host.

These results have significant implications for understanding stem cell aging and reproductive longevity, suggesting that therapeutic strategies targeting niche maintenance rather than stem cells themselves might be more effective. The conserved nature of both autophagy and stem cell niche biology indicates these findings may extend to mammalian systems, opening new research directions in reproductive biology and aging. This work positions our institute at the forefront of niche-stem cell interaction studies and highlights the power of Drosophila as a model for uncovering fundamental biological principles with potential translational applications.

Understanding the intracellular functional diversity of lysosomes

Lysosomes are single membrane cellular organelle in all eukaryotic cells, leading the degradation and recycling of cellular and extracellular material (example: protein aggregate, lipid droplet, damaged cellular organelle, pathogens). This is achieved by hydrolase enzymes, which are active only in the lysosomal acidic environment. Lysosomes also act as secondary storage and signaling centers for cellular ions (NH_4^+, Cl^-, H^+, Ca^{2+}) and lipids (cholesterol, sphingolipids). The homeostasis of lysosomal ions, proteins and lipids is

dependent on cellular positioning of these organelle, membrane contacts with other organelle such as endoplasmic reticulum (ER) and mitochondria, membrane proteome and lipidome. In the lab, we are screening lysosomal functional parameters such as these during a metabolic switch (amino acid starvation) to identify parameters affecting lysosomal physiology. Using cellular models of lysosomal storage disorders such as *NPC1* KO (Niemann-Pick disease type C) and *CLN-3* KO (Batten disease/juvenile ceroid lipofuscinosis), a family of rare neurodegenerative diseases, we plan to study multidimensional changes in lysosomal physiology and function, compared to healthy cells. The findings will identify potential lysosomal targets to recuperate degradative function in these diseases.

Genetics and Plant Breeding

Crop improvement

ARI is engaged in improving the productivity and profitability of crops on an ecological and economically sustainable basis. The institute is one of the leading centres for improving crops such as wheat, soybean and grapes under the All India Coordinated Research Projects funded by the Indian Council of Agricultural Research, New Delhi.

Biotechnology

Pyramiding of rust resistance genes into high-grain-quality wheat lines developed through marker-assisted selection

The project aims to deliver newer versions of well-adapted high-yielding varieties as well as new improved genotypes combining superior grain quality and rust resistance with the best possible agronomic performance. In previous seasons, recipient lines with improved quality parameters (MACS 2496 + *Gpc-B1+Lr24* and NI 5439 + *Gpc-B1+Lr24*) were crossed with the donor for leaf rust resistance HD2967 (*Lr19-Sr25+Lr34*). In the subsequent progeny, breeding lines with 3 genes were advanced to the F6 stage during the season 2023-24. About 69 breeding lines with improved rust resistance and morphological traits were evaluated for agronomic and end-use quality traits. A comparison of these promising lines with checks revealed non-significant differences in grain yield and agronomic traits but improved grain protein content and gluten strength. Based on yield, thousand-grain weight, protein content and gluten strength, 19 promising lines were evaluated for second-year yield, grain protein content, and gluten strength traits. Based on two years study, fifteen promising lines showed significant improvement in grain protein content and gluten strength while keeping similar grain yield and agronomic traits. Wheat lines carrying high degrees of rust resistance will serve as a valuable genetic resource in future wheat improvement program.

To study the effect of *Gpc-B1* transcription factor on gluten protein composition and content

The effects of the transcription factor *Gpc-B1* on gluten protein content, composition, and end-use quality were studied in the *Gpc-B1* introgressed lines, developed in the background of varieties MACS 2496, NI 5439 and Lok1. These findings suggest that the *Gpc-B1* wild allele can effectively contribute to enhanced loaf volume, potentially increasing wheat products' marketability and consumer appeal. The study demonstrated that the wild-type *Gpc-B1* allele was significantly linked to an increase in grain protein content. This enhancement was achieved by elevating the levels of gliadins and glutenins. However, the increase in grain protein and its subclasses was not uniform and varied according to the specific genetic background. In the MACS 2496 genetic background, the enhanced grain protein content resulted in elevated levels of ω, α/β, and γ-gliadins. Additionally, it improved the HMW-GS and loaf volume while having no effect on the LMW-GS. In

the NI5439 genetic background, the increased protein content raised the levels of α/β and γ-gliadins, as well as glutenins and loaf volume, but did not influence the ω-gliadin content. For the Lok-1 genetic background, the rise in grain protein content enhanced the levels of ω, α/β, and γ-gliadins, as well as LMW-GS, but did not impact the HMW-GS content. In the Lok-1 genetic background, the wild allele of *Gpc-B1* led to a decrease in grain yield by reducing the average grain weight. In contrast, this effect was not observed in the NI 5439 background. Although yield diminished in the MACS 2496 background, this decline was unrelated to average grain weight. Therefore, the influence of the wild allele of *Gpc-B1* differs across various genetic backgrounds.

Alternative dwarfing genes introgressed into Indian wheat cultivars for improvement in seedling vigour, plant stature, harvest index, lodging resistance

Alternative dwarfing genes *Rht14* and *Rht18* provide semi-dwarf stature to wheat plant while retaining long coleoptile and better seedling establishment traits, thereby helping in emergence of seedlings under stubble-retained and dry conditions. Such wheat cultivars will be less affected by left-over crop residues and limited moisture conditions making them ideal candidates for conservation agriculture. Advanced breeding lines carrying *Rht14* and *Rht18* were evaluated for agronomic performance under restricted irrigation deep sown (9±1 cm) conditions and stubble retained conditions at multiple locations. The lines showed significant increase in germination (up to 89%) under deep sown conditions compared to lines carrying *Rht-B1b* (69%). Advanced breeding lines carrying Rht14 and *Rht18* showed significantly superior yield (26.7 q/ha) than the *Rht-B1b* lines (20.74 q/ha) under restricted irrigation conditions at Pune location. Under restricted irrigation conditions in North Western Plain Zone, these lines showed yield potential of 57.94 q/ha under restricted irrigation and 71.68 q/ha under high fertility conditions.

Identification of genomic signatures associated with pollen sterility in the seedless mutant of grapevine

A key innovative finding was the discovery of complete pollen sterility in the seedless mutant. This sterility was associated with significant downregulation of critical transcription factors—DUO POLLEN, SIDECAR POLLEN, bHLH, LOB, WRKY, and NAC—implicating them as central regulators of male gametophyte development. Further innovation came from whole-genome resequencing, which revealed unique InDel mutations in genes crucial for tapetal development, male fertility, and cell wall modification, highlighting new candidate loci potentially governing seedless traits. Importantly, these findings suggest that the seedless phenotype may arise from parthenocarpy, providing a new direction in understanding hormone-regulated seedless fruit development. By integrating genomic and transcriptomic evidence, this research delivers novel genetic and regulatory targets that can be used for functional validation and potentially marker-assisted breeding of seedless grape cultivars. The study sets the stage for precision breeding approaches in viticulture aimed at improving fruit quality and consumer preference.

Breeding for high-yielding elite soybean cultivars with climate/disease resilience and end-use quality traits by multi-parent hybridisation and genomic-assisted selection

141 F1 hybrids from 2-way crosses among 24 MAGIC founder lines were successfully developed and validated. 14 significant SNPs linked to domestication-related traits through genome-wide association studies (GWAS)

were identified. 198 soybean genotypes for salinity tolerance (at both seed germination and seedling stages), as well as for oil content, protein composition, and seed quality traits across multi-location trials were screened (**Figure 15**). Efforts are currently underway to develop Kompetitive Allele-Specific PCR (KASP)

Figure 15

A. Screening of 198 genotypes under 200 mM NaCl concentration at the seedling stage, 21 days after sowing, with data recorded 14 days after treatment. **B.** Leaf Scorch Score assessed using a 1-5 hedonic scale.

Wheat Improvement

Wheat research at ARI aims to develop high-yielding, disease-resistant, and end-use quality wheat (T. *aestivum*, T. *durum* and T. *dicoccum*) varieties for India in the general and peninsular zone in particular, in collaboration with ICAR-AICRP wheat programme coordinated through IIWBR Karnal. ARI wheat breeding programme targeted four agro-ecosystems viz., rainfed, irrigated full fertility, restricted irrigation, and late sown for the development of wheat varieties in all three species. Breeder seed production is done as entrusted by the ICAR/Central or State Government. The institute also directly disseminates the latest wheat production technology into farmers' fields through field demonstrations. The following progress and activities are undertaken through institutional support and collaborative projects with ICAR New Delhi, ICAR-IIWBR Karnal, CIMMYT Mexico, DBT New Delhi and DST Government of India.

ARI wheat varietal development program

Development, selection and advancement of breeding lines: To develop the breeding lines hybridisation programme, we generated 210 parental cross combinations and they will be screened for hybrid vigour and actual F1 behaviour.The breeding materials of 540 cross combinations represented as lines/bulk from different segregating generations of $F_2$to F_6 were screened and selected based on traits and objectives.

Station trials for yield: We have conducted 16 station trials for yield evaluation. A total of 538 entries developed from institutional research, material selected from international nurseries and collaborative projects were being evaluated for yield performance. From these trials, we have promoted 35 entries to the IPPSN trial. A similar number of trials and entries were planted in the current year.

Disease evaluation: All the breeding materials were screened and evaluated for leaf rust, stem rust and leaf blight. The artificial inoculation of rust spores was injected and sprayed about 5 to 7 times to maintain the appropriate disease intensity.

ICAR-AICRP Wheat

Breeding trials: A Total of 193 entries from different parts of India were planted and evaluated in the current year. Sixteen ARI wheat lines advanced in the nationally coordinated trials. Twenty-one and 11 wheat entries from MACS-ARI are being assessed in the AVT & NIVT, respectively. Promotion of 35 new wheat entries developed at ARI to the national program on IPPSN is based on three years of yield and disease data from station trials, and promising entries will enter the national level multilocation trial for the next three years.

Pathological trials: A total of 10000 entries were evaluated for diseases, including leaf rust, stem rust, leaf blight, and fusarium head blight. Through analysis and selection criteria, the previous year's trials were concluded with resistant and susceptible entries.

Agronomical trials: The performance of genotypes was evaluated under timely and late sown conditions in two different experiments and their results are summarized below.

Irrigated Timely Sown (IR-TS-DOS-TAD): In this trial, five bread wheat (*aestivum*) entries WH 1306, NWS 2222, DBW 443, PBW 891, and AKAW 5100 were evaluated against three check varieties, GW 322 (C), MP 1378 (I)(C), and MACS 6222 (C). Grain yield decreased by 8.1% when sowing was shifted from timely to late conditions, with average yields of 50.89 q/ha and 46.72 q/ha, respectively. This decline was primarily due to reduced earhead density and lower test weight under late sowing. Among the test entries, DBW 443 showed a numerical yield advantage but was statistically on par with the best check, MACS 6222 (C).

Irrigated Late Sown (IR-LS-DOS-TAS): In this trial, four genotypes (HI 1674, LOK 79, NIAW 4114, NIAW 4120) were evaluated against four checks (HI 1633, RAJ 4083, HD 3090, HD 2932) under late and very late sowing conditions. Grain yield declined from 46.71 q/ha (late) to 42.03 q/ha (very late) due to reduced earhead density. Among the test entries, NIAW 4120 recorded the highest mean yield, outperforming all checks.

Wheat Breeder Seed Production Programme

Distribution of 219 q of breeder seed for the 2024-25 wheat cropping season to seed agencies (Mahabeej, NSC, KSSC), seed industries, Farmers producers' organisations and farmers. The seed will reach approximately 1.5 to 2.0 lakh ha in Peninsular India (Maharashtra and Karnataka). Nucleus seed and breeder seed production programme material was planted at Hol, Songaon farm, and in farmers' fields (through contract farming). In the current cropping year, we have produced 334 q of raw/unprocessed breeder seed for the distribution in the upcoming cropping season 2025-26.

Scheduled Caste Sub Plan (SCSP)

Through the SCSP and other capacity-building initiatives, efforts are being made to empower marginalized farmers by providing them with advanced wheat varieties, technical training, and sustainable farming practices. These programmes aim to enhance the socio-economic conditions of farmers in Maharashtra by promoting the adoption of high-yielding varieties and innovative agricultural technologies. Recently, two wheat training and input distribution programmes were conducted in collaboration with KVK, Baramati, specifically designed to support Scheduled Caste (SC) farmers (**Figure 16**). These initiatives focus on improving productivity, resilience, and long-term sustainability, contributing to a more inclusive agricultural landscape.

A. Wheat Production Technology & Seed Distribution (Ahilyanagar District)*:* Improved wheat variety DBW 359 seeds were distributed to 50 SC farmers in Jawalke and Pimpalgaon Unda villages, covering 50 acres to promote high-yielding, disease-resistant wheat cultivation.

B. Post-Harvest Management Training & Input Distribution (KVK Baramati): A training program was conducted for 50 SC farmers from Pune District on wheat post-harvest practices. Inputs such as sprayers, tarpaulins, and micronutrients were distributed to support crop protection and grain storage.

Figure 16
Wheat training and input distribution programme

Germplasm characterisation and trait discovery in wheat using genomics approaches and its integration for improving climate resilience, productivity and nutritional quality

The diverse germplasm accessions of about 3148 were evaluated in the first year, and the core set of 500 and 600 new germplasm were evaluated in the 2nd and 3rd years. The pooled analysis over 2 years of evaluation data revealed some accessions with high adaptability and stable genotypes at our location. The elite lines selected across different traits, including stress tolerance indexes, physiological traits (NDVI, CT, Biomass) and yield stability traits suitable for drought stress tolerance, compiled and constituted new trials for 2024-25. The accession with the desirable traits for drought tolerance mechanisms and stable yield performance was again evaluated in the current year. The best lines will be selected for further evaluation. Some of the identified lines with trait values for drought tolerance mechanisms were included in the crossing block to derive new breeding lines. The robust and cost-effective technique for screening and precisely quantifying RSA traits in diverse wheat lines was assessed.

Accelerating genetic gains in maize and wheat for improved livelihood

The analysis concluded from the previous year's field evaluation of 120 entries and selected 13 best high-yielding entries from the AGG project (SABWGPYT_ TPE3_ Trial 7 & 8), which are promoted to advanced station yield trials and also utilised in the crossing program. 22 entries from the CIMMYT selections from nurseries and yield trials are promoted to advanced station trials and 5 out of them are being used in the crossing program. This year, we have planted 180 entries for field evaluation. The selected genotypes from the multilocation trails of this program will be tested in the national pipeline of the variety release from the 2024-25 cropping season.

Dissection of diversity and complex mechanism of *Bipolaris sorokiniana* infections in wheat using ToxA-Tsn1 interaction

The host-pathogen interactions studies during wheat and fungal pathogens *Bipolaris sorokiniana* are being evaluated. Whole genome sequencing of 09 isolates of B. sorokiniana, and phenotyping of the 500 wheat genotypes against spot blotch was completed. About 130 isolates of Bipolaris were collected from various locations. Screened 1,000 wheat accessions for resistance (*Sb1, Sb2, Sb3, Sb4*) and susceptibility (*Tsn1*) genes for the spot blotch. Whole genome sequencing of nine representative isolates, namely - KO-5803, RAJ 3972, Seed 28, HD 3091, RAJ 3705, Black Isolate, DD 1025, HI 1538, and MP 1261, were completed for prediction of secreted proteins and effectors. Five representative isolates (i.e., Seed_28, MP_1261, HD_3091, HI_1538, RAJ_3705) were analysed with the other three reference species, namely *B. maydis*, *B. sorokiniana* ND90Pr, *B. oryzae* ATCC44560. The effector protein analysis of six strains from six different *Bipolaris* species showed that 232 (31.65%) out of 733 proteins were shared by all tested strains. The orthologous gene groups of eight *Bipolaris* species were analyzed using OrthoFinder, revealing each proteome's species name and total orthogroups. An UpSet plot demonstrating the number of candidate effector genes that displayed similar expression profiles. The protein analysis of six strains from six different Bipolaris species showed that 72 (9.82%) out of a total of 733 proteins were shared by all tested strains, whereas unique species shared 25 proteins, 213 proteins were shared by two species, 103 proteins shared by three species, 88 proteins shared by four species and 232 proteins shared by five species. Furthermore, 11 specific proteins were detected in isolate_Seed_28, 5 in *B. oryzae* ATCC44560, 3 isolate_HD_3091 and 2 each in isolate_RAJ_3705,

isolate_HI_1538, and isolate_MP_1261. Additionally, the bar chart shows the total number of orthogroups identified in each genome of the six species of Bipolaris, of which *B. sorokiniana* isolate_HD_3091 had the most orthologous genes (551).

Development of improved agro-technologies for Punarnava (*Boerhavia diffusa*), Gokshura (*Tribulus terrestris*), Vasaka (*Justicia adhatoda*), Shankhapushpi (*Evolvulus alsinoides*), and Varun (*Crataeva nurvala*) for enhanced livelihood of farmers in Maharashtra

This initiative aims to enhance farmers' livelihoods in Maharashtra through advancements in medicinal plant cultivation. Experimental planning, nursery management and plantation at field and collection of seed materials. Monitoring and observation for these planted species is underway. For seed multiplication during Rabi 2024-25, locally collected seeds of Gokshura (*Tribulus terrestris*) and Punarnava (*Boerhavia diffusa*) have been planted on the farm for further multiplication. Additionally, Varun (*Crataeva nurvala*) seedlings have been collected and planted at the research farm.

Soybean Improvement

Soybean research at MACS ARI Pune comprises of soybean crop improvement through conventional breeding techniques and biotechnological tools, agronomic evaluation of soybean elite entries and development of soybean production technologies, technology transfer through frontline demonstrations and production of quality nucleus and breeder seed production and supply to the seed multiplying agencies, to aid the seed mission of Department of Agriculture and Cooperation, Government of India. This programme is fully sponsored by the Indian Council of Agricultural Research, New Delhi, since 1968 and is being run as an All India Coordinated Research Project on Soybean.

Developmental soybean breeding programme

a) Hybridization and evaluation of breeding material

During kharif 2024, fourteen promising varieties and breeding lines were sown in the crossing block for hybridization to incorporate the desired improved trait into the prevailing soybean accessions. Earliness, High oil, High Yield, Null Trypsin, Null Lipoxygenase, Rust resistance, YMV resistance, Charcoal Rot Resistance and Vegetable and food grade type were the target traits. A total of 34 cross combinations with 1775 hybridizations were attempted, and breeding material generation advancement is in progress.

b) Evaluation of MACS soybean varieties in All India Co-ordinated Breeding trials

Soybean varieties developed at MACS-ARI, *viz.* MACS 1859 and MACS 1831 were tested in an initial varietal trial for yield and overall performance across the 32 centres at the all-India level, with yields of 2681 and 2801 kg/ha, respectively. Similarly, MACS 1884, an early maturing (99 days) soybean variety, was tested in soybean early IVT trials with a yield of 1405 kg/ha in the year 2024.

c) Evaluation of elite soybean entries developed through breeding programme under station trials

Breeding efforts led to the development of seventy-one elite soybean breeding lines and were tested in three graded replicated trials. Of these, 8 lines gave significantly more yield than the highest yielding

control (check) varieties KDS 992, DSb 34, JS 93-05, MACS 1460 and JS 95-60. Out of these, three lines, MACS 1868, MACS 1897 and MACS 1883, gave seed yields of 4437, 4285 and 3912 kg/ha, respectively. These entries will be proposed for the initial varietal trial (IVT) of the All India Coordinated Research Project for all India evaluation.

d) **Field evaluation and molecular screening of 120 soybean genotypes for Null KTi & Lox2 gene-free** was carried out out of which 17 genotypes were identified as null for KTi, 13 genotypes free of Lipoxygenase-2 gene and 2 genotypes null for both. These two null genotypes for both will be evaluated under field conditions for yield and other related traits, and will be proposed either for release as a variety or germplasm.

Agronomic evaluation and development of soybean production technologies

Effect of plant growth regulators along with recommended dose of fertilizer (RDF) was evaluated on soybean showed that growth regulators (NAA 25 ppm at 25 DAS) and bio-stimulants (CaNO3 7 g +Fe 2g + Mepiquat Chloride 10 ppm at 38-42 DAS, Potassium Schionite- 7 g + 2 g Zn/lit water + Tria contranol 2 ppm) along with RDF helped in meeting the nutrients required by soybean plants for growth, development and contributed to 18.56% higher yield over RDF only.

Soybean crop supplemented with seed treatment of Mo and soil application of Zn & Fe along with RDF was found suitable method of micronutrient application and profitable in terms of high yield. Crop supplied with 100% RDF + Mo seed treatment + Zn & Fe soil application (4040 kg/ha) gave significantly higher seed yield over 100% RDF (3439 kg/ha), 125% RDF (3018 kg/ha) and 150% RDF (2830 kg/ha) and at with rest of the treatments, and was remunerative over RDF only by Rs. 25,000/- ha.

Impact of herbicides and microbial strains on soybean productivity was assessed, the weed-free check (2 hand weeding at 20 and 40 DAS) along with *B. daqingense* @ 10 g/kg seed + *B. aryabhataii* @ 10 g/kg seed (3938 kg/ha) was found significantly superior in terms of yield over the weedy check alone and in combination with PGPR. The highest weed control efficiency was observed in Weed-free check- 2 hand weeding at 20 and 40 DAS (75.12%) followed by Diclosulam @ 26 g/ha + Post emergence: Propaquizafop 2.5% + Imazethapyr 3.75% @ 2.0 litre/ha (70.11%).

Technology transfer/ outreach programme and its socio-economic impact

In order to demonstrate the impact of improved production technology over the traditional practice of soybean cultivation, fifteen frontline demonstrations comprising the recently released soybean varieties were conducted (**Figure 17**). Improved practice is able to bring out the 17% increase in soybean yield over farmers' traditional practice, mostly due to the sowing of the improved soybean variety MACS 1460 and insect-pest management practices. An average yield under improved practice was 28.61 q/ha, while it was 23.94 q/ha under farmers' practice in the whole package, 19.50 q/ha under improved practice, and 17 q/ha under farmers' practice in intercropping with sugarcane, respectively. With an additional cost of Rs. 5367/- per hectare, a net return of Rs. 10,924/- per hectare is the benefit due to the adoption of the improved practice of soybean cultivation.

Figure 17
Frontline demonstrations and farmer-scientist interaction

Soybean breeder and nucleus seed production

A total of 249 quintals of breeder seed of soybean varieties, including MACS 1188, MACS 1460, MACS 1520, MACS 1407, MACS 1281 and JS 335, have been supplied during kharif 2024 to public and private seed multiplying agencies and farmers as a source of pure seed (**Figure 18**). Similarly, 417 quintal soybean breeder seed production was undertaken, and will be supplied during the coming kharif 2025 season. Also, 11.95 quintals of nucleus seed of soybean varieties MACS 1188, MACS 1460, MACS 1520, MACS 1407, MACS 1281 and JS 335 have been produced, which can be the source of seed for breeder seed production in kharif 2025.

Figure 18
Soybean Breeder Seed Production

Grape improvement

During the current year, in the grape breeding programme, twenty-eight cross combinations were carried out using ten female parent varieties and four seedless male parents. The male parents included two black varieties, Jumbo and Nana Purple and two white varieties, SSN and RK, all of which are commercially popular for developing high-quality, seedless table grapes. A total of 467 seeds were harvested from the crosses and subjected to chilling treatment to promote optimal germination.

The ARI grape germplasm collection currently comprises six Vitis species, 62 grape cultivars, six wine grape varieties, and nine rootstock types, all maintained on their own root systems.

Characterization of farmers' grape varieties and their facilitation for registration with PPVFRA

The Protection of Plant Varieties and Farmers' Rights (PPV&FR) Act provides a legal framework for the registration of traditional crop varieties. This process grants formal recognition to a farmer-developed variety and ensures protection against unauthorized commercial exploitation. The registration of a Farmers' Variety

involves submitting a detailed description of the variety along with evidence of its DUS traits. Farmers often require scientific guidance and technical support in the characterization and registration process. Total six farmers were facilitated for the registration of their varieties with PPV&FRA.

Awareness Programme for PPV & FR 2001

Awareness about farmers' varieties registration and their rights among grape growers is being created by arranging seminar. One such training cum awareness programme was arranged at Hol during the farmers' Mela. It received a very good response with approximately 140 Extension officers of Department of Agriculture, input distributers, farmers and students in attendance. The interactive sessions facilitated a better understanding of the PPV&FRA Act and its implications for farmers.

Nanobioscience

The Nanobioscience group at ARI is engaged in research in several areas, including the development of organ-on-a-chip systems, nanomaterials suitable for applications in medicine, and applications of nanomaterials in agriculture.

A prophylactic 'nanocoat' ensures increased success of dental implants

One of the major challenges in dental implant procedures is the failure caused by bacterial infections around the implant area. To address this issue, we developed an innovative coating for titanium dental implants by adding a thin layer of silver using a technique called direct current sputtering. The successful formation of this silver "nano-coating" was confirmed using several techniques such as X-ray photoelectron spectroscopy (XPS), surface profilometry, Scanning electron microscopy (SEM) and energy dispersive spectroscopy (EDS) and atomic force microscopy (AFM) (**Figure 19**). This coating was extremely thin, only ~530 nm, but exhibited a significant impact on the physicochemical characteristics. It made the surface more hydrophilic which may improve its integration with the bone. Importantly, the silver coating released small, controlled amounts of silver over a 21-day period. This would provide the antibacterial effect against harmful bacteria that are implicated in infections around implants. We tested the bactericidal effect against *Streptococcus oralis*, *Streptococcus sanguinis*, *Aggregatibacter actinomycetemcomitans*, and *Porphyromonas gingivalis*, which belong to the yellow, purple, and red complexes, representing specific periodontal pathogens. In addition to being antibacterial, our study showed that the implants with a nanosilver coat were safe for human bone cells (viz., MG63 osteoblasts). These cells grew and functioned normally on the coated surface, showing signs of better bone integration over time. This indicates that the silver nanocoat may help implants bond faster and more securely with the jawbone. It combines antibacterial protection with excellent compatibility for bone growth, potentially reducing complications and ensuring increased success of dental implants in patients.

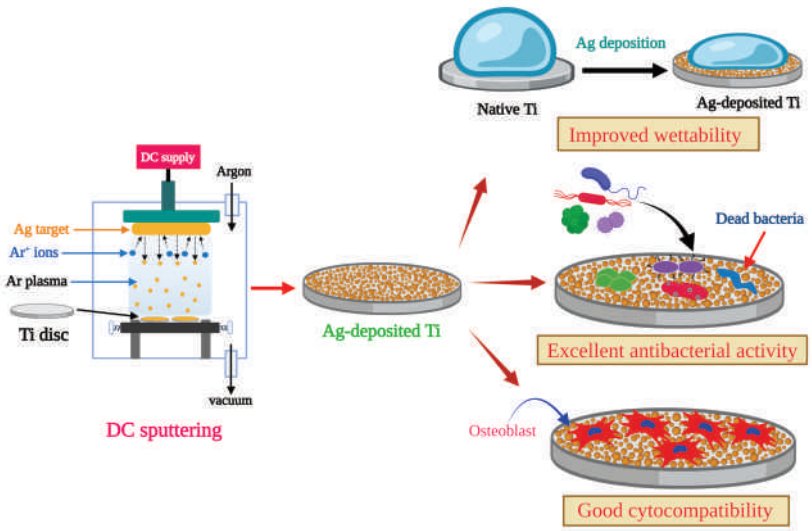


Figure 19
Schematic representation of the process of nanocoating and assessment of bioactivity

Zinc oxide nanoparticles: a complementary treatment for managing diabetic kidney disease

Diabetes that goes untreated for a long time can lead to serious complications, including damage to the kidneys—a condition known as diabetic nephropathy (DN). Zinc deficiency can worsen diabetes mellitus. Previous research from our lab has shown that zinc oxide nanoparticles (ZON) can help control blood sugar levels and support insulin-like activity. To take this further we explored whether ZON can also help protect kidney function in diabetes by targeting the underlying causes of kidney damage, including inflammation, cell death, and scarring (fibrosis). We used diabetic Wistar rats to model kidney disease and treated them with different doses of ZON (1, 3, and 10 mg/kg body weight). Urine and serum biochemical parameters, glomerular filtration rate (GFR), and renal histology were also evaluated to assess the kidney functions. In in vitro experiments, we treated specialized kidney cells (E11 podocytes) with ZON under high glucose conditions, mimicking diabetes.

Results showed that Wistar rats treated with ZON showed improved kidney function and no visible kidney damage. ZON helped block biological pathways that cause cell death and tissue scarring in the kidneys. ZON reduced inflammation and oxidative stress—both of which are major contributors to kidney disease in diabetes. ZON treatment resulted in the retention of normal structure and function of E11 podocytes, indicating protective effects against the high glucose concentration.

Thus, experimental data suggests that zinc oxide nanoparticles may serve as a promising complementary therapy for preventing or slowing the progression of diabetic kidney disease. These findings warrant clinical studies in other model systems and human volunteers.

Fighting Bacteria Smarter: Improved Erythromycin Delivery Using nanoparticles

Bacterial infections are getting harder to treat because many bacteria no longer respond to common antibiotics like erythromycin. Recently, nanoparticles made from a safe, man-made material called PLGA displayed effective drug delivery. In this study, PLGA nanoparticles were fabricated to carry erythromycin. The PLGA drug nanoparticles were 160 nm in size and encapsulated a good amount of the drug inside them. When tested, these drug-loaded nanoparticles were 1.5 to 2.1 times more effective than bare erythromycin at stopping the growth of harmful bacteria like *E. coli*, *S. aureus*, and *P. aeruginosa*. The PLGA drug nanoparticles damaged the bacteria's outer layer, as observed microscopically. Furthermore, the PLGA drug nanoparticles coating on glass prevented over 90% of *P. aeruginosa* bacteria from forming biofilms—a protective layer bacteria build that makes them harder to kill. This study shows that packaging erythromycin in PLGA nanoparticles not only makes the drug work better but also helps prevent bacteria from sticking to surfaces—something very useful for medical devices.

Enhanced Pest Control and Plant Immunity Using Silica-Based Nanoparticles

As *Spodoptera litura* (armyworm), a common lepidopteran pest, has developed resistance to conventional insecticides, there is an urgent need to explore alternative control strategies. Here we explored the role of silica-based nanoparticles against the insect pest. Two types of silica nanoparticles—solid and porous—ranging from 100 to 160 nanometers in size were synthesized and fed to Spodoptera larvae. When these nanoparticles were consumed by the caterpillars, they caused high mortality rates (73% and 80%) even

at very low doses. The nanoparticles were absorbed into the caterpillar's gut, disrupted key biological processes, and significantly reduced metabolic enzyme activity, leading to less feeding and weight loss. When applied to soybean leaves, the nanoparticles remained on the leaf surface without being absorbed by the plant, indicating good plant safety. Additionally, the treatment boosted the plant's natural defense responses, including the production of jasmonic acid, a defense hormone. Lab tests also showed the particles were not toxic to cells. Overall, silica nanoparticles show promise as a safe and effective method to control pests and enhance plant defences.

$\alpha_v\beta_3$ integrin aptamer functionalized pH-responsive lipid polymer hybrid nanoparticles for targeted co-delivery of paclitaxel and tamoxifen

Triple-negative breast cancer (TNBC) is the most aggressive and deadly form of breast cancer due to its high recurrence and metastasis rates. This study focused on developing a targeted drug delivery system using lipid polymer hybrid nanoparticles (LPHNPs) to co-deliver two anticancer drugs—paclitaxel (PTX) and tamoxifen (TMF). To enhance targeting, the nanoparticles were conjugated with an $\alpha_v\beta_3$ integrin aptamer, which specifically binds to TNBC cells. These targeted nanoparticles showed significantly higher uptake in TNBC cell lines (4T1 and MDA-MB-231) compared to non-targeted ones. The aptamer-conjugated, drug-loaded LPHNPs drastically reduced cancer cell viability and induced much higher apoptosis (31%) compared to non-targeted (21%) and free drugs (13%). Additionally, co-delivering PTX and TMF was more effective than using them alone. In 3D cell culture models, the targeted system showed superior cancer cell-killing ability. Overall, the study suggests that this aptamer-guided LPHNP system offers a promising strategy for more effective and targeted TNBC treatment.

Biodegradable polyester-based hyperbranched nanocarrier-modified with N-acetyl glucosamine for efficient drug delivery to cancer cells through GLUTs

Cancer is one of the top causes of death in the world, second only to heart disease. Common treatments like chemotherapy and radiation often harm not only cancer cells but also healthy ones. One promising method uses special materials called hyperbranched polymers. These materials can carry cancer-fighting drugs and attack cancer cells more precisely. In our study, we used a type of polymer called H40 Boltorn™ and attached N-acetyl glucosamine to it. We tested these modified drug carriers using different scientific tools to make sure they were working as expected. We also used confocal microscopy to compare how much of the cancer drug, doxorubicin, reached the cancer cells using both the modified and unmodified versions. The modified version clearly worked better. When tested on two types of breast cancer cells, the modified carrier showed stronger cancer-killing effects. This new approach may lead to more effective cancer treatment with fewer side effects.

Development of a gas-permeable biocompatible lipid-PDMS-cellulose acetate composite membrane

A lipid-PDMS-cellulose acetate composite membrane was developed and characterized for permeability and cell culture compatibility. The membrane demonstrated liquid impermeability in a static droplet test while allowing controlled diffusion of gases (CO_2) and solutes (FITC-dextran), as confirmed by colorimetric and fluorescence assays. L132 epithelial cells cultured on the membrane exhibited sustained proliferation over seven days, with metabolic activity and cell morphology comparable to standard culture surfaces, as assessed by Presto Blue assay and confocal microscopy. These findings indicate that the membrane is selectively

permeable to gases and biomolecules while maintaining structural integrity and biocompatibility, making it a promising candidate for in vitro barrier models and cell-based assays.

Innovative Vaccine Strategies and Protein Expression Systems

Our research focused on innovative strategies in virology and biotechnology, emphasizing vaccine development and recombinant protein expression. A significant achievement was the development of a dual vaccine candidate against Chikungunya virus (CHIKV) and *E. coli* using heat-killed bacterial cells expressing the CHIKV E2 protein (**Figure 20**). This approach demonstrated a robust IgG immune response in mice, offering a cost-effective and safe alternative to traditional vaccine platforms. Additionally, we explored *Acanthamoeba castellanii* as a novel eukaryotic host for recombinant protein expression, successfully producing CHIKV E2 and prothrombin proteins. The system exhibited intermediate glycosylation patterns, suggesting its potential for post-translational modifications, bridging the gap between bacterial and mammalian expression systems.

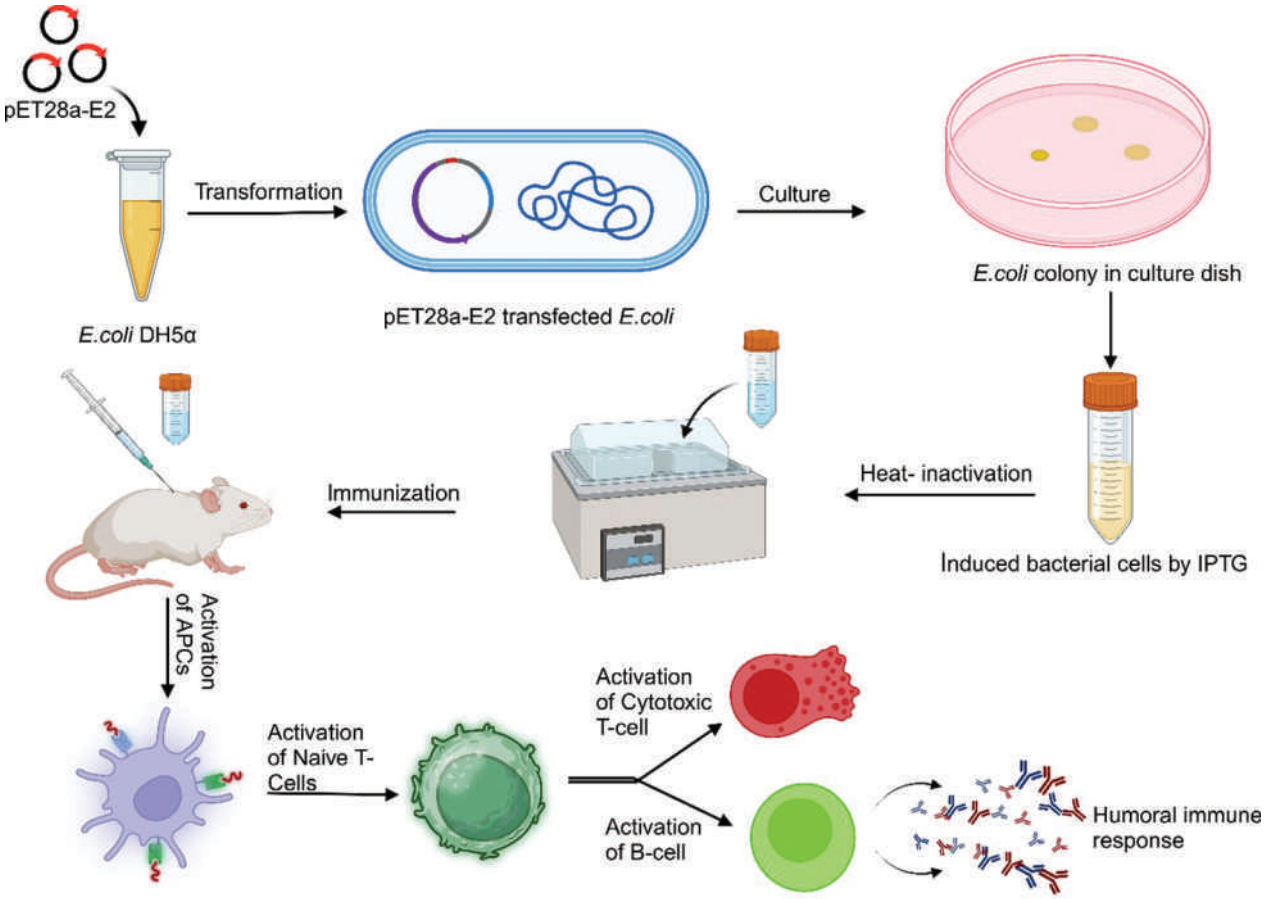


Figure 20

Schematic representation of the dual vaccine development strategy using *E. coli* expressing CHIKV E2 protein. The process involves: (1) Transformation of *E. coli* DH5α with the pET28a-E2 plasmid; (2) Culture and IPTG-induced expression of CHIKV E2 protein; (3) Heat inactivation of bacterial cells for vaccine preparation; and (4) Immunization to activate immune cells, eliciting an immune response against both CHIKV and *E. coli.*

Annexure

Repositories

Agharkar Herbarium at MACS (AHMA)

The digitization process is currently underway at the herbarium, where around 1000 accessions are scanned and given barcode-QR code.

Ajrekar Mycological Herbarium (AMH)

Ajrekar Mycological Herbarium holds 10784 exsiccate specimens including 102 specimens received from different centers in India for deposit and accession during the period of report.

Animal Facility

The Animal Facility is registered with the Committee for Control and Supervision of Experiments on Animals (CPCSEA), Ministry of Environment and Forests, Government of India, New Delhi. The facility operates under Registration No. 101/GO/RRcBiBt/S/99/CPCSEA and holds licenses for a) Research and breeding of small laboratory animals, b) Breeding of rats and mice for trading purposes, and c) Conducting research for commercial purposes.

The facility has made significant progress in areas such as monitoring and maintenance, ethical oversight, infrastructure development, project execution, scientific output, animal welfare, training and outreach, revenue generation, model development.

Crude Drug Repository

It houses a curated collection of over 1,400 samples comprising various plant parts used in traditional and modern medicine, obtained through both field collection and market sourcing. The repository also offers authentication and identification services to a broad user base, including pharmaceutical companies, academic researchers, and students. The authentication efforts not only support the accurate identification of botanical materials but also reinforce quality assurance and regulatory compliance in both academic and industrial applications.

Diatom Collection

There are 5436 samples, ranging from the present day to the Pleistocene period. The culture collection includes 30 strains of the genus *Gomphonema* Ehrenberg.

Fossil Repository

This is India's third largest fossil collection with over 5000 fossil type specimens of various animal groups including mollusca, brachiopoda, echinodermata, annelida, chordata, bryozoa, and trace fossils collected from various sedimentary basins of India. Over 3000 microfossils, including foraminifera, pollens and spores are also part of the collection.

MACS Collection of Microorganisms (MCM)

MCM is a distinguished repository of anaerobes and extremophiles. The entire catalog of approximately 1000 bioresources was digitized and a dedicated website was launched for MCM (https://mcm.aripune.res.in). MCM was awarded affiliate membership *of* the World Federation for Culture Collections (WFCC). MCM offered services such as microbial deposits, culture supplies, microbial identification and characterization, and analytical testing and hosted an online workshop on DNA sequencing and analysis.

Deposits available at MCM

Category of Deposit	Type of Microbial Resource				Total
	Archaea	Bacteria	Anaerobic Fungi	Microbial Consortia	
General Category 1 (Specialized)	165	46	2	4	217
General Category 2 (Common)	16	720	--	--	736
Safe Deposit	1	16	--	--	17
Total	**182**	**782**	**2**	**4**	**970**

Nation Fungal Culture Collection of India (NFCCI -WDCM 932) - National Facility

As a part of the conservation of fungal diversity, live, pure and authenticated cultures of interesting fungi received from various organizations in India were deposited and accessioned. The total accession of NFCCI comes to 6010. The fungal germplasm is being maintained in culture collection by following standard long-term preservation methods, like freeze drying, distilled water, glycerol and liquid nitrogen. A total of 294 fungi were accessed during the period of report and 126 authentic fungal strains were supplied to various academia, research institution, and industry.

Library and Information Centre

The Library houses scientific literature of Founder Director Prof. SP Agharkar. The archive holds book collections, rare back volumes, periodicals, and reference works primarily in German. The library has print, online journals, and databases accessible within the campus through campus LAN. It is also a part of a CSIR-DST consortium known as the National Knowledge Resource Consortium (NKRC). The Library has acquired quillbot, Scite.ai, Office 365. The Library has migrated totally to KOHA-open-source software. SMART-DMS is an active repository of various information related to the institute, including research papers, patents, monographs, PhD thesis, etc. Collection of books in Hindi is regularly updated. Fresh information resources are emailed to the users. The Library and Information Centre maintains the institute's website and social media sites (Facebook, Twitter, Instagram and Youtube).

Holdings of the Library

Particulars	Total	Particulars	Total
Books / Bound Volumes	30337	Maps and Atlases	569
Reference Books	1138	Microfilms / Fischer	636
Ph.D. Thesis	433	Annual Report	12
M Sc / M Phil Thesis	97	Journal	55
ARI Reprints/ Articles	3937	Digital collection/Documents	3232

Services

Crude Drug Authentication

One hundred and ninety-three crude drug samples were authenticated, of which 173 were submitted by academic institutions, representing a wide variety of plant materials such as bark, roots, stems, leaves, and whole plants. Sixteen samples originated from industrial entities, reflecting ongoing collaboration with the private sector in the domains of research and product development. These industrial submissions typically included raw plant materials like seeds, fruits, bark, and stems, which are essential to manufacturing processes and formulation development.

Fungal Identification Service of NFCCI

During the period of the 327 fungal cultures report, other samples received from academic, research institution and industry were authenticated / identified. As such, 155 centers including academic & research institutions and private centers in India benefited from various services of national facility for fungi.

Institutional Core Activities

Biodiversity & Palaeobiology

Plants & Diatoms	BD-07 Diatom herbarium and culture collection
	BOT-15 Digitizing AHMA
	BOT-17 Repository of crude drugs, and authentication services
Fungi	MYC-02 National Facility – Repositories and service (NFCCI, AMH, and Identification Service)
Palaeobiology	BD-03 Modernization of fossil repository
Bioenergy	MIC-10 Microbial Culture Collection

Intellectual Property

Plant Varieties Registry	ARI 516 grape variety registered under PPV&FRA
Patent granted	Title: Nucleic Acid-Based Test Kit to Detect Viral RNA, DNA, Other Biomolecules And An Assay Thereof
	Patent No.: 542982
	Date of Grant: 26.6.2024

Memorandum of Understanding/ Agreement etc.

With	Purpose
Entrepreneurship Development Centre, Pune	Handling IPR matters
Dilip Shinde, Baramati, Pune	Producing wheat breeder seed
Hanumant Gawade, Baramati, Pune	Producing wheat breeder seed

With	Purpose
DD Enterprises, Pune,	Studies on brewer's yeast (*Saccharomyces cerevisiae*)
Fergusson College (Autonomous), Pune	Joint research - Exploration of bioactive natural products from *Nyctanthes arbor tristis* L for the management of rheumatoid arthritis
Sant Gadge Baba Amravati University, Amravati	Sustainable utilisation of medicinal plant resources in Maharashtra
BAIF, Pune	Action research for standardizing cultivation, harvesting and processing practices for higher bioactive content of selected neurotonic medicinal plants
Institute of Chemical Technology, Mumbai	Assistance for S&T Applications
Bajaj College of Science, Wardha	Standardising cultivation, harvesting and processing practices with expertise in agriculture and botany
RC Patel Institute of Pharmaceutical Education & Research, Dhule	Designing effective and safe formulations
NRDC, New Delhi - GPS Renewables, Bangalore	Unlocking sustainable energy: Scaling up and pilot trial of enhanced microbial methane production from agricultural residue using anaerobic fungi
PACE-DSIR, New Delhi - NRDC, New Delhi - GPS Renewables, Bangalore	Unlocking sustainable energy: Scaling up and pilot trial of enhanced microbial methane production from agricultural residue using anaerobic fungi
KMCT Dental College, Kozhikode	Cooperation within the field related to biological sciences and technology
Turiya Therapeutics LLC, Dover, USA	Nanocarrier for delivery of an ensconced payload, method of its preparation and applications thereof
BAIF, Pune	Joint research & development
HTBS, Pune	Joint proposal to BIRAC-FermTech: a standardised fermentation platform for large scale biocatalyst, specialty chemicals and microbial cells manufacturing
Gubbi Labs LLP	Exploring water quality and addressing heavy metals and emerging pollutants for basin conservation in the Ghod region
Birla Institute of Technology, Mesra	Cooperation within the field related to biological sciences and technology
IISER, Pune	Cooperation within the field related to biological sciences and technology
NRDC, New Delhi	Hemohalt hemostatic bandage for halting blood loss rapidly
Hi Tech Biosciences, Pune	Analysis & characterisation of probiotic properties of microbial cultures provided by HTBS (First addendum)

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Thite, S; Godbole, D; Debnath, M; Bhatt, A; Yadav, A; Lodha, T; Joseph, N; Kirdat, K; Boruah, D; Sharma, R; Joshi, A. 2024. Alkalimonasmucilaginosa sp. nov. and Alkalimonascellulosilytica sp. nov. isolated from alkaline Lonar lake, India. Antonie Van Leeuwenhoek International Journal of General and Molecular Microbiology, 117 (1): Article 88. DOI: 10.1007/s10482-024-01986-6. (Impact Factor= 1.8)

Tseplik, N; Radhakrishnan, C; Karthick, B; Kulikovskiy, M. 2025. Indoplatessa gen. nov.—a new monoraphid diatom genus based on Platessa arborea (Achnanthidiaceae, Bacillariophyceae). Phytotaxa, 694 (2): 161-172. DOI: 10.11646/phytotaxa.694.2.4. (Impact Factor= 1.050)

Varghese, S; Jisha, MS; Rajeshkumar, KC; Gajbhiye, V; Alrefaei, AF; Jeewon, R. 2024. Endophytic fungi: A future prospect for breast cancer therapeutics and drug development. Heliyon, 10 (13): Article e33995. DOI: 10.1016/j.heliyon.2024.e33995. (Impact Factor= 3.776)

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Wijayawardene, NN; Hyde, KD; Mikhailov, KV; Péter, G; Aptroot, A; Pires-Zottarelli, CLA; Goto, BT; et al. 2024. Classes and phyla of the kingdom Fungi. Fungal Diversity, 128 (1): 1-165. DOI: 10.1007/s13225-024-00540-z. (Impact Factor= 24.902)

Williams, DM; Toyoda, K; Schuster, TM; Karthick, B; Taxböck, L. 2025. Achnanthescrenulata Grunow (Bacillariophyta): Observations on type specimens and related material. Nova Hedwigia, Early Access. DOI: 10.1127/nova_hedwigia/2025/1098. (Impact Factor= 1.254)

Yadav, LS; Patil, JR; Sharma, M; Cordeiro, TRL; Santiago, ALCMD; Singh, PN. 2025. Syncephalastrum bagoolii (Syncephalastraceae, Mucorales), a new fungus from India. Phytotaxa, 691 (2): 188-200. DOI: 10.11646/phytotaxa.691.2.5. (Impact Factor= 1.050)

Zambare, R; Bhagwat, V; Singh, S; Guntha, M; Ghormade,V; Tupe, S.G; Shaikh, S.; Deshpande, MV. 2025. Microcycle Conidia Production in an Entomopathogenic Fungus Beauveria bassiana: The Role of Chitin Deacetylase in the Conidiation and the Contribution of Nanocoating in Conidial Stability. Microorganisms , 13(4): 900. https://doi.org/10.3390/microorganisms13040900. (Impact Factor= 4.1)

Visits Abroad

Choudhary RK. International Botanical Congress, Madrid, Spain, 21-27 July 2024

Gajbhiye V. Multilayered Nanoconstructs for Targeted Delivery of Drugs/Sirna to Treat Various Cancers, 3rd International Conference on Materials Science and Engineering, Amsterdam, Netherlands, 26-27 September 2024

Joshi B. Max Planck Institute of Heart and Lungs Research, Germany, 12 January-12 March 2025

Patra C. Max-Planck- Institute, Germany, 15 September-30 October 2024; ICDAR 2024 Meeting, Prague, Czech Republic, 18-20 September 2024

Participation in Conferences/ Symposia/ Seminars/ Workshops/ Training/ Meetings

Biodiversity - Plants and Diatoms

Choudhary RK. From Refugium to Radiance: Understanding Smilacaceae Speciation in the Himalayas. XX International Botanical Congress, Madrid, Spain, 20-27 July 2024; *Poudhon ki anuvanshik vividhta evam iske samajik ayam*. 2nd Official Language Seminar of DST Autonomous Institutions, Nainital;Meeting, Research Advisory Committee, NGCPR, Shirwal, 15 April 2024; Meeting, Department of Botany, SPPU, Pune, 22 April 2024; 18 July 2024; XX International Botanical Congress, Madrid, Spain, 20-27 July 2024; Panelist, Indo-US Cancer Moonshot Dialogue, Department of Biotechnology, NII, New Delhi, 5-6 August 2024; IV All India Rajbhasha Sammelan, New Delhi, 14-15 September 2024; Lecture, Rajbhasha Conference, DST autonomous bodies, ARIES, Nainital, 20-21 November 2024; DSC online Meeting, IIISM, TDU, Kattankulathur, 23 December 2024; Workshop, MoEFCC, New Delhi, 10 December 2024

Datar MN. Project evaluation meeting, RGSTC, Mumbai, 7 May 2024; 4 February 2025;

Meeting, IUCN Western Ghats Plant Specialist Group, Key Stone Foundation, Kotagiri, Tamil Nadu, 19-20 June 2024; Meeting, RGSTC, Sustainable Utilization of Medicinal Plant Resources in Maharashtra, ARI, Pune, 8 July 2024; Online Meeting, Western Ghats Plant Specialist Group, 10 September 2024; Meeting, C-Ganga project, IIT Kanpur, GIPE, Pune, 9 October 2024; Meeting, Board of Studies, Abasaheb Garware College, Pune, 10 October 2024

Online Meeting, Maharashtra Gene Bank, 16 December 2024; Meeting, Advanced Centre for Treatment Research & Education in Cancer, Mumbai, 4 February 2025; Meeting, Vibha, Pune, IITM, Pune, 4 March 2025, Research Advisory Committee online Meeting, Khalsa College, Mumbai, 5 March 2025

Karthick B. Panel discussion, Knowledge and data creation and sharing in freshwater science. Conference, Freshwater Ecosystem Conservation Status, Needs and Future Actions, IISER Kolkata, 20-21 April 2024; Meeting, Bio Culture Testing on river/ nalla water, Environmental Department, Pune Municipal Corporation, 10 May 2024; PSC meeting, Ministry of Earth Science and National Institute of Ocean Technology, Chennai, 24 September 2024; Meeting, Development of Science Textbook for Grades 7 and 8, NCERT, New Delhi, 16-17 November; 12-13 December 2024; Workshop, Archaeology and Ecology of Bandhavgarh Tiger Reserve, Ashoka University, 22 November 2024; Seminar and Brainstorming Session, Integrated Paleolimnological Studies, Indian Institute of Geomagnetism, 24 December 2024; Hindi Samelan, Jaipur, 17–18 February 2025; Co-organiser, Young Investigator Meeting, India Bioscience, Agra, 3–7 March 2025

Bokil S, Choudhary RK, Datar MN. Molecular phylogeny of genus *Ischaemum* L. in India. National Conference, Plant Sciences for a Sustainable Future: Innovations and Challenges, Goa University, 16-17 January 2025

Kadu M. Workshop, Extraction and Isolation of Phytoconstituents, 15-16 October 2024

Maurya SK, Sarawgi A, Sukhramani G. International Conference, Botanical Survey of India, Kolkata, 13-15 February 2025

Nayak P. Workshop, Metabarcoding, Centre for Cellular and Molecular Biology, Hyderabad, 5-18 October 2024

Sukhramani G, Choudhary RK. Taxonomic revision, molecular phylogenetics and biogeography of Smilacaceae, with an emphasis on its diversification in the Himalayas. International Conference, Botanical Survey of India, Kolkata, 14 February 2025

Sukhramani G. Workshop, Molecular Phylogeny, University of Hyderabad, Hyderabad, 10-14 October 2024

National Seminar, Plants 2025: Biodiversity to Biotechnology, Savitribai Phule Pune University, 5-6 March 2025

Sarawgi A, Choudhary RK. Taxonomy and floral architecture of Canscora: Bridging morphology and molecular data.

Kadu M, Choudhary RK. Pharmacognostic signatures of Haplanthodes: Ensuring quality, purity and efficacy

2nd Indian Quaternary Congress, IISER Mohali, 3-5 June 2024

Joshi P, Phartiyal B, Karthick B. Response of glacial lakes to climate changes in the Ladakh Range, NW Trans Himalaya.

Thacker M, Karthick B. Tracing environmental changes in freshwater Myristica swamp ecosystems: Diatoms as indicators of modern and paleoecological dynamics.

Poster presentation

Sukhramani G, Choudhary RK. Molecular systematics of *Smilax*: Tracing evolution across the Indian Subcontinent and Himalayas, National Seminar on Plants 2025: Biodiversity to Biotechnology, Savitribai Phule Pune University, 5-6 March 2025

Thacker M, Karthick B. Unveiling Quaternary Asian monsoon dynamics: A comprehensive review through diatom records, 2nd Indian Quaternary Congress, IISER Mohali, 3-5 June 2024

Biodiversity - Fungi and Lichens

International Conference, Role of Fungi in Sustainable Development: From Exploration to Application, Savitribai Phule Pune University, Pune, 23-25 October 2024

Nischitha R. Grass Endophytic Fungi: A Gateway to Future Bio-Innovations

Rana S. Professor Kamal Merit Award (First Prize) for Young Researchers

Singh SK. Fourth All India Official Language Conference, Bharat Mandapam, New Delhi, 14-15 September 2024

Rashtriya Samyukt Rajbhasha Vaigyanik Sangoshthi-2024, ARI, Pune, 3-4 April 2024

Nischitha R, Singh SK. अन्तः पादपीय (एंडोफाइटिक) कवकों के लाभकारी प्रभाव

Singh PN. *Maharashtra ke paschimi ghat se khoje gaye pachhinid / birds' nest Cyathus (Nidulariaceae) verg ke kavakon ka adhyayan evam sanvardhan*

Nischita R, Rana S

AFB-CON2024 International Conference, Role of fungi in sustainable development: From exploration to application & 2nd Annual meet of Association of fungal biologists, SPPU and Prof. Ramkrishna More College, Pune, 23-24 October 23-24

Maurya DK, Singh PN, Singh SK. Isolation, identification, bioactivity of fungi and endophytic actinomycetes from medicinal plants.

Pawar K, Singh PN, Singh SK. Exploring the uncharted territory of fungi thriving in alkaline environment.

Singh PN, Pawar K, Singh SK. Morpho taxonomic and phylogenetic studies on cercosporoid fungi and their conservation in NFCC

Singh PN. Hindi Karyshala: Rajbhasha ka Abhivaykti Saamarthya, ARI, Pune, 27 May 2024; Workshop, Nasha Mukt Bharat Abhiyan, ARI, Pune, 12 August 2024

Ansil PA. Interdependent Dynamics in Graphidaceous Lichens of the Western Ghats, India. Conference, Advances and Perspectives in Cryptogam Research, Indian Lichenological Society, CSIR-National Botanical Research Institute, Lucknow, 9-11 December 2024

Poster presentation

Rajesh Kumar KC. 12th International Mycological Congress (IMC12), Maastricht, Netherlands, 11-15 August 2024

International Conference (AFBCON-2024) on Role of Fungi in Sustainable Development: From Exploration to Application, and 2nd Annual Meet of Association of Fungal Biologists (AFB), Savitribai Phule Pune University, Pune, 23-25 October 2024

Gaikwad SB. Bioactive potential of lichen metabolites and its effect on lactic acid bacteria

Kamunkar AK, Nischitha R. Metabolite profiling, in vitro antifungal and antioxidant properties of *Aspergillus chevalieri* endophytic in *Cynodon dactylon*

Sachin V. An in-silico investigation of lichen secondary metabolite's anticancer potential

Sutar RR. Studies on cardioprotective potential of lichen metabolites

Meshram PA, Nischitha R. Isolation and characterization of endophytic fungi from medicinal plants of Pune, Maharashtra. National seminar, PLANTS 2025: Biodiversity to Biotechnology, Savitribai Phule Pune University, Pune, 5-6 March 2025

Nishchitha R. Workshop, MALDI-TOF for Microbial Identification (Fungi & Bacteria), ARI, Pune, 24 May 2024

Biodiversity - Paleontology

Gamare PG. National Joint Rajbhasha Scientific Symposium-2024, ARI, Pune, 3-4 April 2024

Poster Presentation

Kaushik T., Dixit V. Paleo-Passion, IISER, Pune, 7 June 2024

Kaushik T., Dixit V. Heavy mineral miners of microscopic work: Samophega (Foraminifera). National Conference, Integrated Earth (CITE-2024), IISER Pune, 1-2 September 2024

Dixit V. 29th Indian Micropaleontology and Stratigraphy Symposium, Delhi University, Delhi, 18-20 October 2024

Bioenergy

Jangid K. MACS sookshmajiv sangrah (MCM): *Avayaviya aur atijivon ki khoj, sanrakshan aur upyog par kendrit ek vishisht sangrah*. Rashtriya Sanyukt Rajbhasha Vaigyanik Sangoshthi, Agharkar Research Institute, Pune, 3 April 2024; 16S rRNA gene sequencing for bacterial identification. Workshop on Bacterial Identification at BISMiS Live (Online), 17 August 2024

Kapse N. Harnessing Sulfate-Reducing Bacteria for the Sustainable Synthesis of Cerium Sulfide, International Conference on Advances in Biotechnology and Bioinformatics (ICABB 2024), Dr DY Patil Biotechnology and Bioinformatics Institute, Pune, 26-29 November 2024; Five poster presentations, ICABB-2024; Poster presentation at Proteomic Society of India (PSICON-2024) conference held from 21 - 23 November 2024 at CSIR-NCL, Pune; Two oral presentations, Bioscience for Harmony with Nature Conference organized by Abeda inamdar college from 16-18 January 2025

Lodha T. ARI ENGAGE: Institutional Capacity Building Programme, 14 October 2024; Workshop on ultimate biogas mastery program, BEST Pvt. Ltd, 29-30 November 2024

Bioprospecting

Navneet Kour, Misar A, Gulawani S, Waghole R, Mahajan S. Extraction and isolation of phytoconstituents, Agharkar Research Institute, Pune, 15-16 October 2024

Navneet Kour. *Karonda ke fal bhag se alag kiye gaye Carrisic acid ki cancer virodhi prabhavkarita*. Rashtriya Samyukta Rajbhasha Vaigyanik Sangoshthi, Agharkar Research Institute, Pune, 3 April 2024; *Karonda ke fal bhag se alag kiye gaye Carrisic acid ki cancer virodhi prabhavkarita*, Hindi Pakhwada Samaroh, Agharkar Research Institute, Pune, 27 September 2024; India International Science Festival, IIT-Guwahati, 30 November-3 December 2024

Srivastava P, Suryavanshi K, Rangari K. 16th Annual Meeting of Proteomics Society, India and International Conference on Integrated Omics Approaches for Decoding Biological Research, National Chemical Laboratory, Pune, 21-23 November 2024

Pandit G. Trace metal analysis for the plateau lichens from the North Western Ghats, Maharashtra, India, ILS Cryptogam Conference on Advances and Perspectives in Cryptogam Research, CSIR-National Botanical Research Institute, Lucknow, 9-11 December 2024

Poster Presentation

Deo A. NGN meeting, IISER-Tiruvananthapuram, 5-8 December 2024

Gulawani S, Srivastava P. In silico studies of synthesized natural product-based phenanthridine compounds as potential anticancer agents. International Conference, Global Cancer Consortium, Amity University, Noida, 28-31 January 2025

Sathe V, Shintre S, Srivastava P. From waste to wellness: Phytochemical profiling and antioxidant evaluation of Mandarin peel extracts. National Conference, Bharti Vidyapeeth, Pune, 12 March 2025 *Consolation Prize*

Suryavanshi K, Rangari K. Effect of Cisplatin on copper transport: A transcriptomic approach. 16th Annual Meeting of Proteomics Society, India, and International Conference on Integrated Omics Approaches for Decoding Biological Research, CSIR-National Chemical Laboratory, Pune, 21-23 November 2024

Developmental Biology

Daware MB. Central Confocal Facility at Agharkar Research Institute, India Bioimaging Meeting, IISER Pune, 12-13 December 2024; National Science Day Exhibition 2025, GMRT, Khodad, Narayangaon, 28 February-1 March 2025

Patra C. 5th Indian Zebrafish Investigators Meeting, Institute of Life Sciences, Bhubaneswar, 6-8 November 2024

Ratnaparkhi A. EMBO meeting, RNA-Protein Complexes: From molecular assembly to physiological functions and disease, NCCS, Pune, 24-28 February 2025

Shravage B. Summer School, Hands-on Training in Computational and Animal Modelling Tools for Design & Discovery of Drugs for Neurodegenerative Disorders, SPP School of Pharmacy, Mumbai; *Mera Budhapa, aapka Budhapa*, Hindi Pakwada, ARI, September 2024

Londhe R. India Bio Imaging meeting, IISER, Pune, 12-13 December 2024; Hindi Workshops, ARI, 27.05.2024, 30.09.2024, 26.12.2024, 27.03.2025; National Science Day Exhibition, ARI, 28 February 2025

Nilangekar K, Shravage BV. Differential role of autophagy in the Drosophila ovarian germline stem cell niche, Women in Autophagy, Webinar, 29 October 2024

Ayachit M, Shravage BV. Autophagy related gene-1 regulates mitochondrial dynamics during *Drosophila* oogenesis, NCBS, September 2024

Selarka K, Shravage BV. *Bone morphogenic proteins GSCs main autophagy ko gair-swayatta roop se niyantrit karte hain*, Rashtriya Sanyukta Rajbhsha Vaigyanik Sangoshti, April 2024

Bhattacharjee A. Connecting lysosomal calcium release to its functional diversity, Workshop, Drosophila as a model organism for biomedical research, ARI, Pune, 11-14 June 2024

Punde A. 16th Annual Meeting of Proteomics Society, India and International Conference on Integrated Omics Approaches for Decoding Biological Research (PSICON2024), CSIR-NCL, Pune, 21-23 November 2024

Poster Presentation

5th Indian Zebrafish Investigators Meeting (IZIM 2024), ILS Bhuvaneshwar

Bhakta S. Integrin α8 regulates epicardium and craniofacial development in zebrafish

Punde A. Ccn2a induces heart regeneration by inducing macrophage infiltration in adult zebrafish

Maity S. Evaluation of neutrophil and macrophage infiltration during caudal fin fold regeneration in zebrafish embryos

Genetics & Plant Breeding

Baviskar Vijendra. International Wheat Improvement Course 2025 training, International Maize and Wheat Improvement Centre, Mexico, 10 March-30 April 2025

Baviskar Vijendra, Jaybhay Santosh. Online Short Course, Agronomic research for food security and environmental stewardship in changing scenarios, Indian Society of Agronomy, 20-29 June 2024; Hands-on Online Training, Statistical Analysis and Exploring the Role of Agriculture in Industry Domains, Indian Society of Agronomy, New Delhi, 22-31 August 2024

Yashavanthakumar KJ. Inspection visits to TSF, Khadegaon, Dist Satara, for the genetic purity test of wheat foundation and certified seed lots by the Maharashtra Seed Certification Agency, 5/09/2024; Monitoring team member for Wheat Breeder Seed Production Program, 2024-25 crop season, UAS Dharwad ,13 February 2025; Monitoring of the PZ wheat AICRP wheat trials, IIWBR Karnal, 10 February 2025

Yashavanthakumar KJ, Navathe Sudhir. Scientific exploration: Generation advancement in wheat as a part of speed breeding cycle to improve the genetic gain, Dalang maidan, ICAR-IIWBR, September 2024; Field survey, data collection: Recorded observations on leaf and stem rust resistance, ICAR-IARI, Wellington, Tamil Nadu, September 2024; Joint Survey Report by IPM Division, DPPQS survey in coordination with ARI, Pune on wheat crop in Nashik, Ahilya Nagar, Chhatrapati Sambhajinagar and Jalna, Maharashtra, 24 February 2025; BISA, Jabalpur, a subsidiary international organization under CIMMYT, Wheat breeding trials, with opportunities to select promising germplasm for future research; Joint Inspection of the Wheat Breeder Seed Production Programme at ARI for the 2024-25 crop season, 18 February 2025

Tetali Sujata. Speaker, Training cum awareness programme, Registration process to PPV&FRA, Farmer's Mela, Hol, 4 August 2024; Chairman, Session, MRDBS Annual Grape Seminar, Hotel Tiptop International, Pune, 24-26 August 2024; Lecture, Invasive plants, Nisarg Sevak, Pune, 20 September 2024; Lead lecture, Characterization and Registration of Farmers' Varieties of Grapes of Maharashtra, Second National Genetics Congress, IARI, New Delhi, 11-13 December 2024

Patil R, Yashavanthakumar KJ, Navathe Sudhir. Hands-on Training on CRISPR/Cas9 Genome Editing in Wheat, ICAR-IIWBR, Karnal, 15-24 October 2024

Patil AS. Workshop, Genomic selection for dryland crops, ICRISAT, Hyderabad, 3-7 February 2025; World Vegetable Centre, ICRISAT, Hyderabad, 4 February 2025

Chavan Siddhi, Patil R, Tetali S. *Tulanatmak yugmakjanan, RNA anukraman aur genome anukraman ka upyog karke angoor ke bijrahit utparivarti mein parag banjhpan ki jaanch*. Rashtriya Samyukt Rajbhasha Vaigyanik Sangoshthi-2024, 3-4 April 2024

Nanobioscience

Gajbhiye V. INSA-NCGG Leads Training Programme, INSA, New Delhi, 1-7 April 2024

Rahalkar MC. Discussant, Bio-Innovations for GHG, focusing on Bio-Innovative Approaches for Mitigating

Methane Emissions, International Rice Research Institute, Global Soil Conference, NASC, New Delhi, 20 November 2024

Poster Presentation

Mayattu K, Ghormade V. Drug delivery of fungal cell wall inhibitor via PEG coated PLGA nanoparticles can prevent aspergillosis infection. National conference on fungal frontiers: Biodiversity, biomolecules and bioengineering applications for sustainable perspectives, 51st Annual Meeting of Mycological Society of India, Jodhpur, 25-29 November 2024

Singh S, Bhagwat V, Maheshwari G, Ghormade V. Biocontrol of the obligate fungus *Leveillula taurica* causing tomato powdery mildew. International Conference on Role of Fungi in Sustainable Development – From Exploration to Application, 2nd Annual Meet of Association of Fungal Biologists, SPPU, Pune, 23-25 October 2024

Choudhary D, Ghormade V. Chitosan nanoparticles - dsRNA complex for specific biocontrol of the polyphagous insect pest, *Spodoptera litura*. APA-EPNOE-GFL International Conference Polymers for Advanced Technology, Jaipur, 16-18 October 2024

Pardhi K, Manvi S, Rahalkar MC. Cultivable methanotrophs from wetland patches from two hills in Pune. Conference, Biosciences for Harmony with Nature (ICBHN-25), Abeeda Inamdar College, 16-18 January 2025.

Invited talks

Biodiversity & Palaeobiology

Plants & Diatoms

Choudhary RK. Molecular Systematics of Plants, National Conference, Recent Innovations in Natural and Physical Sciences, Shardabai Pawar Mahila Arts, Commerce & Science College, Baramati, 5 April 2024; APG System of Classification, MSc, Department of Botany, SPPU, Pune, 22 April 2024; Keynote lecture (online), Workshop, Hyderabad City College, Hyderabad, 20-21 September 2024**;** Online, Rethinking Plant Taxonomy: Emerging Trends and Concepts, Refresher course for college teachers, Department of Botany, University of Jammu, Jammu, 11 November 2024; Molecular Taxonomy: Boon or Bane and its implications on species concept, Refresher cum service training for botanical assistants, Central National Herbarium, Botanical Survey of India, Kolkata, 3 December 2024; Keynote address and lecture, Workshop, Integration of AI and Machine Learning in Plant Systematics and Biodiversity Conservation, Central University of Jammu, 19-20 February 2025; Keynote address, Evolving Perspectives and Shifting Paradigms in Plant Systematics, Conference, St Joseph's University, Bengaluru, 14-15 March 2025

Datar MN. Plant Evolution, Certificate Course in Field Botany, MACS-ARI and Nisargsevak, Pune, 12 April 2024; Panel discussion, Buzzing Towards Biodiversity: Elevating the Importance of Bees in Global Biodiversity and Ecosystem Conservation, Shilim Institute; Vanaspatinchyaa Nawabhovatichya Katha, Jividha, Pune, 4 July 2024; Plant identification, Jnana Prabodhini, Nigdi, 22 August 2024; From Beauty to Burden: Ornamental Garden Plants Invading Indian landscapes, Maharashtra Vruksh Samvardhini, 19 October 24; Online, Plant nomenclature: twists and tales, Gogate Joglekar College, Ratnagiri, 12 December 2024; Sacred Groves: The Nexus of Indian Ecological Wisdom, Research Legacy and Global Scientific Acceptance, Workshop, Ancient groves & modern Wisdom: Bridging wisdom in conservation, ARI, 18 December 2024; Changing landscapes of sacred grove research, Workshop, Maharashtra State Forest Department, Pune, 6 January 2025; Bridging Ecosystems: Goa's Role as a Transition Between Northern and Central Western Ghats, Conference, Plant Sciences for a Sustainable Future: Innovations and Challenges, Goa University, 16 January 2025; Keynote address, From Ancient Shelters to Modern Skyscrapers: Insights from Cliff Research in the Northern Western Ghats, Conference, Plants 2025: Biodiversity and Biotechnology, Department of Botany, Savitribai

Phule Pune University, Pune, 5 March 2025; Plant morphological characters for identification, Wadia College, Pune, 7 March 2025

Karthick B. Conference, Freshwater Ecosystem Conservation Status, Needs and Future Actions, Indian Institute of Science, Education and Research, Kolkata, 20-21 April 2024; Journeying Through Diatoms: Unravelling History, Biodiversity Hotspots, and Their Versatile Applications, International Colloquium of Microalgae and Diatom Research organised by Liquid Trees (online talk), 8 May 2024; Online talk for PhD students, Microscopic Marvels: Exploring the Diatoms at the Intersection of Microbiology and Geology, Department of Environmental Sciences, SPPU, Pune, 23 July 2024; Science outreach program, Millennium National School, Kothrud, Pune, 18 October 2024; Ancient Waters and Modern Wonders: Diatoms as Narrators of Bandhavgarh's Environmental Past and Present, Workshop, Archaeology and Ecology of Bandhavgarh Tiger Reserve, Ashoka University, Sonipat, 22 November 2024; Decoding Lake Histories: The Underexplored Potential of Diatoms in the Tropics, Indian Institute of Geomagnetism, 24 December 2024; Freshwater Ecology and Conservation, MSc, Wildlife Institute of India, Dehradun, 12–14 February 2025; Setting up and running a life science research group in India, Breakout session discussion, 3 March 2025

Fungi & Lichens

Singh SK. National Joint Official Language Scientific Seminar-2024, ARI, Pune, 3-4 April 2024; National Conference, Expanding the Horizons of Microbial Research in Agriculture, ICAR-NBAIM, Mau, Uttar Pradesh, 10-11 June 2024; Keynote, National Conference, Frontiers in Science & Sustainability: Innovations in Research for Viksit Bharat, Sunbeam College for Women, Varanasi, 10-11 March 2025; Keynote, National seminar, PLANTS 2025: Biodiversity to Biotechnology, Savitribai Phule Pune University, 5-6 March 2025; National Conference, Emerging Issues and Sustainable Strategies in Plant Health Management: A Global Perspective, Indian Phytopathological Society, New Delhi and ICAR-Central Citrus Research Institute, Nagpur, 19-21 January 2025

RajeshKumar KC. COGNITOPIA: Multidisciplinary Academic Fest, Government College for Women, Thiruvananthapuram, Kerala, 16-18 January 2025; Polyphasic Taxonomy of Fungi and Microfungi Taxonomy. High-End Workshop, Hands-on Training on Classical and Molecular Techniques in Plant and Fungal Identification, KSCSTE-Kerala Forest Research Institute, Kerala, 10-15 June 2024

Nischitha R. Endophytic Fungi: A Hidden Treasure of Bioactive Metabolites (online mode). Faculty Development Program, Fungal Biotechnology: Emerging Trends and Applications, NIT Warangal, 7 August 2024

Rana S. Rajiv Gandhi Institute of IT and Biotechnology, Bharati Vidyapeeth Deemed University, Pune

Paleontology

Kaushik T. Prof. K. V. Kelkar Memorial Lecture, Fergusson College, Pune, 28 December 2024; Induction Program for M.Sc. students, Savitribai Phule Pune University, 23 August 2024; Faculty Induction Program (Online), Guru Dakshata, Malaviya Mission Teacher Training Centre, Indira Gandhi National Tribal University, Amarkantak, 17 December 2024; M.Sc. Micropaleontology Course, SPPU

Bioenergy

Dagar S. Harnessing Anaerobic Fungi for Efficient and Sustainable Energy Production from Lignocellulosic Biomass. International Conference on Role of Fungi in Sustainable Development—From Exploration to Application, Savitribai Phule Pune University, 24 October 2024; The Role of Anaerobic Microorganisms in Renewable Energy Production, 167th Saturday Meet series, Department of Microbiology, Savitribai Phule Pune University, Pune, 1 February 2025; Principles of Cultivation of Anaerobes & Overview of Specialized Equipment. Know Anaerobes-Grow Anaerobes, ARI and BJ Medical College, 21 November 2024; round table discussion on the topic "Syntrophies and Antagonisms of Neocallimastigomycota", The International Anaerobic Fungi Congress-2024 (online).

Jangid K. The MACS Collection of Microorganisms (MCM) at ARI, Pune: synergizing bioresources for sustainable bioenergy, environmental resilience, and beyond. 3rd International Conference on Innovations in Biotechnology Research for Sustainable Bioresources and Bioeconomy: Challenges and Practices (IB3-2025), Kopargaon, Maharashtra, 28 March 2025; Exploring the secret world of tiny microbes. 2024. Citizen science lecture at Venezia cooperative housing society, Pune, 12 September 2024;Design and Development of in-vitro Diagnostics (IVD) Medical Devices. RIDE2024, Innovation Conclave of MIT World Peace University, Pune, 22 August 2024; Empowering Microbiology in India: the Global Influence of IUMS and ICSP. Lecture Series, Microbiologists Society India (Online), 16 June 2024.

Kapse N. conducted lectures and hands-on training sessions on Anaerobes at Work: Applications in Biotech Industries and Next Generation Sequencing and Bioinformatic analysis for the students as a part of the "On Job Training" course. Demonstration of Antibiotic susceptibility testing at "Know Anaerobes – Grow Anaerobes" workshop jointly organized by Agharkar Research Institute (ARI) and BJ Medical College, Pune on November 21, 2024.

Kshirsagar P. Performance of an anaerobic fungus for enhanced Biomethanation of shredded rice straw under optimized Parameters. International Conference on Role of Fungi in Sustainable Development—From Exploration to Application, Savitribai Phule Pune University, 23-25 October 2024; Understanding of Aspects of Fermentation Technology. On Job training participants, 24 Jun-12 Jul 2024.

Lodha T. Implications of Antimicrobial resistance on Healthcare and novel intervention strategies. National level seminar, Rajarambapu College of Pharmacy, Kasegaon, 29 April 2024; Visiting faculty member of SPPU, Department of Microbiology delivered a lecture on Introduction to metabolomics on 12-03-2025; Visiting faculty member of SPPU, Department of Microbiology delivered a lecture on Techniques in metabolomics on 19-03-2025; Cultivation of anaerobic bacteria and its applications in the On Job training program; Anaerobic media preparation, GC analysis and anaerobic glow box in the workshop "Know Anaerobes – Grow Anaerobes" jointly organized by Agarkar Research Institute (ARI) and BJ Medical College, Pune on November 21, 2024.

Biodiversity

Srivastava P. Natural products are gold mine for the discovery of drugs, SNJB Pharma Conference, Exploring Biodiversity for Pharmaceutical Applications, Shriman Sureshdada Jain College of Pharmacy, Nasik, 8 December 2024; Conversion of edible fruit waste into useful products for cancer prevention, Global Cancer Consortium Conference, Amity University, Noida Campus, Uttar Pradesh, 28-31 January 2025

Developmental Biology

Patra C. Pharmacy Education and Research in Biomedical Field, JIS University, Kolkata, March 2025; TIFR Mumbai, January 2025; Faculty Development Programme, Brainware University, Kolkata, February 2025; International Institute of Molecular and Cell Biology, Warsaw, Poland October 2024; JISUCONPH2024, JIS University Kolkata, October 2024; Calcutta University, October 2024; NIBMG, Kalyani, October 2024; Modern College of Arts, Science and Commerce, Shivaji Nagar, Pune, July 2024; BIT Mesra, Ranchi, August 2024; Dr BC Roy College of Pharmacy and Allied Health Sciences, Durgapur, August 2024; Recent Trends in Biology, SPPU 2024

Ratnaparkhi A. No Garland Neuroscience Meeting, IISER, Trivandrum, 5-8 December 2024; Organelle Biology Membrane Trafficking Meeting, 29 October 2024; *Drosophila* Workshop for Teachers, IISER-Pune, 23-30 December 2024; Germ Cell Stem Cell Meeting, 28 February-2 March 2025; Centre for Neuroscience, IISc, Bangalore, 10 March 2025

Shravage B. Drosophila as a model for drug discovery for neurodegenerative diseases, Hands-on Training in Computational and Animal Modelling Tools for Design & Discovery of Drugs for Neurodegenerative Disorders, SPP School of Pharmacy; Drosophila Oogenesis: A multifaceted model in developmental biology and studying starvation-induced autophagy; Workshop for college teachers on using Drosophila melanogaster for biology laboratory classes, Department of Zoology, Banaras Hindu University, Banaras, 23 February-1 March 2025; Kirtimukha, Ouroborous and autophagy, Drosophila as a model system for Biomedical Research, 12 June 2024; Research on Autophagy, PK Thorat Senior College, Pune, 18 April 2024; Invited Speaker – at the Summer School on Neurological diseases at the SPP Patel College of Pharmacy, Mumbai

Bhattacharjee A. Insights into the cellular autophagy-lysosomal degradation system, Department of Zoology, Bethune College, Kolkata, 7 January 2025; No Garland Neuroscience Meeting, 5-8 December 2024, IISER, Trivandrum; Organelle Biology Membrane Trafficking Meeting, 29 October 2024; *Drosophila* Workshop for Teachers, IISER Pune, 23-30 December 2024; Germ Cell Stem Cell Meeting, 28 February-2 March 2025; Centre for Neuroscience, IISc, Bangalore, 10 March 2025

Genetics & Plant Breeding

Baviskar V. Biofortification Based Agronomic Solutions for Yield and Zinc Optimization in Wheat (online), HarvestPlus, 9 and 30 November 2024

Idhol BD. Training, Soybean cultivation for sustainability at farmers, State Agriculture Department, Tahsil Agricultural Office Khandala, Satara District, 19 June 2024; Training, Soybean Pik Utpadan, Krushi Sanjivani Pandharwada, State Agriculture Department, Tahsil Agricultural Office, Baramati, Pune District, 20 June 2024

Jaybhay SA. Training, Soybean cultivation practices, Indori and Nanoli villages, Vadgaon Maval Tahsil, Pune, State Agriculture Department and Agricultural Technology Management Agency, 28 May 2024; Training, Improved production technologies of soybean, seed treatment to soybean seed and soybean seed germination testing before sowing, State Agriculture Department and Agricultural Technology Management Agency, Waghalwadi village, Baramati Tahsil, Pune, 7 June 2024; Training, Improved Soybean Practices, Tahsil Agriculture Office Khandala, Bori village, Satara, 27 June 2024; Soybean insect-pest and disease management, Kanheri taluka, Sub-Divisional Agriculture Office, Baramati, Pune, 22 July 2024; Soybean Seed Production and Importance of Roughing in Seed Production Plot, Farmers Mela, Sakol Farmer Producer Organization, Shirur anantpal, Latur, 6 August 2024

Patil R. Science Projects, Science Day Exhibition, MES Bal Shikshan Mandir English Medium School, Pune, 4 February 2025

Nanobioscience

Bodas D. Biosensors and organ on chips. Department of Physics, Wadia College, Pune, 21 November 2024; Nanotechnology and its applications. Workshop, Nanotechnology in Life Sciences, Department of Botany, Wadia College, Pune, 20 February 2025

Ghormade V. Smart nanotechnologies for the future. Delhi Public School, Mohammadwadi, Pune, 28 November 2024

Rahalkar M. Unfolding the science of COVID-19. Modern College Shivajinagar, Pune

Rajwade JM. Scientific Research Skills. HV Desai College, Pune, 11 October 2024; Biosensors. Department of Biotechnology, Vidya Pratishthan's College of Arts, Commerce and Science, Baramati, 22 October 2024; Primer and Probe design. MICROCON 2024, Department of Microbiology, BJ Medical College, Pune, 21 Nov 2024; Harnessing Bacterial Cellulose for Sustainable Development Goals. Conference, Biosciences in

Harmony with Nature, ICBHN-2025. Department of Microbiology, Abeda Inamdar Senior College of Arts, Science and Commerce, Pune, 17 January 2025; Overview of Nanobiotechnology. Department of Microbiology, Appasaheb Jedhe College of Arts, Science and Commerce, Pune. 3 January 2025; Phage Display:Techniques and Applications. Saturday Meet, Department of Microbiology, SPPU, Pune, 8 February 2025

Honours/ Awards/ Distinctions

Biodiversity & Palaeobiology

Plants & Diatoms

Choudhary RK. Winner, 3-minutes oration competition, Swachhata Pakhwada, ARI; International Travel Grant from SERB for the International Botanical Congress, Madrid, Spain, 20-27 July 2024; Advisory Board Member, Naoroji Godrej Centre for Plant Research, Shirwal, Satara

Karthick B. Member, Organising committee, 2nd Indian Quaternary Congress, IISER Mohali, 3-5 June 2024; Member, National Academy of Sciences India; Council member, International Union for Quaternary Research 2027 conference, Lucknow, 1-7 February 2027; Member, Research Advisory Council, Birbal Sahni Institute of Palaeosciences

Maurya S. Winner, Best poster presentation, International Conference, Botanical Survey of India, Kolkata, 13-15 February 2025

Sarawgi A. 2nd prize, Best poster presentation, International Conference, Botanical Survey of India, Kolkata, 13-15 February 2025

Kadu M. 3rd prize, Best oral presentation, Seminar, Plants 2025: Biodiversity to Biotechnology, SPPU, Pune, 5-6 March 2025

Sarawgi A. Winner, Best oral presentation, Seminar, Plants 2025: Biodiversity to Biotechnology, SPPU, Pune, 5-6 March 2025

Sukhramani G. Winner, Best poster presentation, Seminar, Plants 2025: Biodiversity to Biotechnology, SPPU, Pune, 5-6 March 2025

Fungi & Lichens

Singh SK. Jeersannidhi Award-2024 of ICAR-Indian Phytopathological Society, New Delhi, National conference, Emerging Issues and Sustainable Strategies in Plant Health Management: A Global Perspective, Indian Phytopathological Society, New Delhi and ICAR-Central Citrus Research Institute (CCRI), Nagpur, 19-21 January 2025

Singh PN. Fellowship of the Association of Fungal Biologists (FAFB2024)

Rajesh Kumar KC. Fellowship of the Association of Fungal Biologists (FAFB2024)

Rana S. Prof. Kamal Merit award (Young researcher-Oral Presentation category)

Suthar M. Prof. MS Patil Merit award (Young researcher - Oral Presentation category)

Ansil PA. Merit award (Young researcher - Oral Presentation category)

Nishchitha R. Executive Editor, Archives of Microbiology, Springer, Germany; Reviewer - Archives of Microbiology, BMC Complementary Medicine and Therapies, Frontiers in Molecular Biosciences, International Journal of Biological Macromolecules, Microbial Ecology, World Journal of Microbiology and Biotechnology, Environmental Microbiome, Scientific Reports, BMC Biotechnology

Bioenergy

Jangid K. nominated as a Full Member of the International Committee on Systematics of Prokaryotes (ICSP) *by* Microbiologists Society India (MBSI), 3 April 2024; appointed as the Chair of the International Union of Microbiological Societies (IUMS) Committee of the MBSI, 1 June 2024.

Kapse N. awarded with best flash talk award for presenting Harnessing Sulfate-Reducing Bacteria for the Sustainable Synthesis of Cerium Sulfide at International Conference on Advances in Biotechnology and Bioinformatics (ICABB 2024) held from 26-29 November 2024 at Dr. D. Y. Patil Biotechnology and Bioinformatics Institute, Pune.

Developmental Biology

Patra C. Member, Board of Studies, Zoology, Modern College of Arts, Science and Commerce, Pune; Member, Japan Society for the Promotion of Science; Member, International Zebrafish Society; Member, Indian Society of Developmental Biologists

Shravage B. Associate Editor (Stem Cell Research), Frontiers in Cell and Developmental Biology; Resource person, 4th and 5th Hands-on workshop for college teachers, Using *Drosophila melanogaster* for Biology Laboratory classes, IISER Pune, 24-31 December 2024; Department of Zoology, Banaras Hindu University, Banaras; 23 February-1 March 2025; Flybase Community Advisory Group member, Flybase, Bloomington, USA.

Londhe R. External examiner, OJT students, MSc Zoology and Biotechnology, Nowrosjee Wadia College, Pune, 5 July 2024

Joshi B. Max-Planck Mobility Grant to perform part of her PhD work at the Max-Planck-Institute for Heart and Lung Research, Germany.

Punde A. Prof. UN Singh award for the best poster presentation

Genetics & Plant Breeding

Best AICRP Wheat Centre 2024 award of ICAR-Indian Institute of Wheat and Barley Research, Karnal, Haryana, 63rd All India Wheat and Barley Research Workers Meet, Acharya Narendra Deva University of Agriculture and Technology, Ayodhya, Uttar Pradesh, 11 September 2025

Navathe S. Young Scientist Award for his contributions to plant protection, NAAS, New Delhi, January 2025

Baviskar V. 16th National Level Maha Agro Idol Award - 2024 for contribution to agricultural research and technology transfer, Agrocare Krishi Manch, 2025

Jaybhay SA. Certificate of appreciation for contribution to the development of soybean agronomy production technology, ICAR National Soybean Research Institute, Indore

Nanobioscience

Karpe Y. Nominee, DST-INSPIRE Faculty Fellowship Selection Committee

Rahalkar MC. Member, Technical Expert Committee, Energy Bioscience, Environmental & Forest Biotechnology, DBT, India

Rajwade JM. Member, Selection Committee, DST's WISE-SCOPE Fellowship programme under WISE-KIRAN Division

Conference/ Workshop/ Seminar/ Training organized

Workshop, MALDI-TOF for Microbial Identification (Fungi & Bacteria), 24 May 2024

Workshop, Drosophila as a Model Organism for Biomedical Research, 11-14 June 2024

Training, On job training, Dept. of Microbiology, Dr DY Patil, Arts, Commerce & Science College, Pimpri, 24 Jun-12 Jul 2024

Workshop, ZEISS on your Campus (ZOYC), 22 July 2024

Confocal Training, ARI students, 28 August 2024

Training, Soybean cultivation and awareness programme of PPV&FR 2001, for Extension Officers of Department of Agriculture, FPOs, SHGs, Agri-input dealers and farmers under the Soybean FLDs, ARI Hol farm, 4 October 2024

Workshop, Extraction and isolation of phytoconstituents, 15-16 October 2024

Conference, Upper Bhima Conservation, jointly with Pune Knowledge Cluster, Foundation for Ecological Security, Jeevitnadi, 22-23 October 2024

Workshop (14th), Taxonomy, Biodiversity, Ex-situ Conservation, and Applications of Fungi, 5-14 November 2024

Workshop, Know anaerobes, Grow anaerobes, 22 November 2024

Workshop, Genetic Tools in Foraminiferal Research, 10-13 December 2024

Seminar, Ancient Groves & Modern Science: Bridging Wisdom in Conservation, 18 December 2024

Workshop, High-end (HPLC/LCMS/GCMS) Analytical Equipment, jointly with Shri. BV Patel Education Trust, Ahmedabad, 9-10 January 2025

Workshop, Surface Water Quality Monitoring, 22-24 January 2025

Workshop (Online), 16S rRNA and whole genome analysis for microbial identification, 29-31 January 2025

Workshop, 3-day Tools and Techniques for Studying Pathophysiology and Gut Microbiome in Zebrafish, 24-26 March, 2025

Workshop, ARI-LIGHTS (lightning talk series) organized seven ARI Lights talks

Workshop, Tools and Techniques for Studying Pathophysiology and Gut Microbiome in Zebrafish, March 2025

PhD Degree Award

Student, Subject	Thesis	Guide, Co-Guide
Bagwan Juned Hanif, Botany	Elucidation of physiological mechanisms contributing to the resilience of wheat under restricted moisture	Tetali S
Cheran Radhakrishnan, Environmental Science	Aerial diatoms of the Eastern Himalayas: Diversity and distribution across environmental gradients	Balasubramanian K
Gaikwad Saurabh, Microbiology	Bacteriophages for the inhibition of sulfate-reducing bacteria associated with oil reservoir souring	Dagar SS
Gaikwad Subhash B, Botany	Studies on selected macro-lichens and their bioactive constituents for its use as pharmaceutical supplements	Behera BC
Methe Pravinkumar S, Biotechnology	Development of wheat genotype with good biscuit making through marker assisted selection & mutation breeding	Oak MD

Student, Subject	Thesis	Guide, Co-Guide
Methe Pravinkumar S, Biotechnology	Development of wheat genotype with good biscuit making through marker assisted selection & mutation breeding	Oak MD
Murmu Nidhi, Biotechnology	Role of autophagy in Germline stem cell ageing in Drosophila ovary	Shravage BV
Nilangekar Kiran, Biotechnology	To determine the role of autophagy in the germline stem cell niche in Drosophila	Shravage BV
Padhye Aishwarya, Biotechnology	Evaluation of zinc oxide nanoparticles in delaying the development of diabetic nephropathy	Rajwade JM
Shigwan Bhushan, Botany	Forests of Northern Western Ghats: diversity, composition and effect of disturbance on tree vegetation	Datar MN
Sutar Ruchira, Botany	Studies on antimicrobial, antioxidative, cardiovascular-protective and cytoprotective potential of selected macrolichens and their secondary compounds	Behera BC
Venkatesan Suhasini, Biotechnology	EMS-induced mutations for wheat improvement and their detection by TILLING	Patil R
Wadmare Neha, Botany	Systematics and Biogeography of the genus Stauroneis (Bacillariophyta) from the Indian subcontinent	Balasubramanian K
Yadav Kunal, Microbiology	Studies on methanogens at extreme eco physiological conditions: Implications for life on Mars	Dhakephalkar PK

Supervision of PhD Students

Guide, Co-Guide	Student, Subject	Thesis
Biodiversity - Plants & Diatoms		
Choudhary RK	Sukhramani Geetika, Botany	Taxonomy, phylogeny, and historical biogeography of Smilax L. in India
	Sarawgi Aditi, Botany	Systematic studies on the genus Canscora Lam. (Gentianaceae) in India
	Kadu Monali, Botany	Phytochemical standardisation and pharmacological studies on selected Haplanthodes species
Datar MN	Bokil Sarang, Botany	Systematic studies on Ischaeminae J. Presl (Andropogoneae - Poaceae) in India
Karthick B	Vigeshwaran Anbukkarasu, Botany	Diatom Diversity across the Streams and Rivers of the Western Ghats and its Application in Water Quality Monitoring
	Pardhi Samadhan A, Botany	Diversity and Distribution of the Genus Gomphonema Ehrenberg in the Western Ghats, India
	Nayak Pratyasha, Botany	An integrated morpho-molecular approach to analyse the diatom assemblages for ecological assessment of Mula-Mutha river basin
	Murugesan Yogeshwaran, Botany	Ecological and Evolutionary Drivers of Gomphonemoid Diatom Diversity in the Western Ghats, India

Guide, Co-Guide	Student, Subject	Thesis
Biodiversity - Fungi & Lichens		
Singh SK	Malika Suthar, Botany	Studies on melanin from fungi and evaluation of its bioactive potential
	Shweta Kumawat, Botany	Studies on the secondary metabolites from selected Ophiocordycipitaceous and other entomogenous fungi from Western Ghats, India, and evaluation of their bioactivities
Singh PN	Kadambari Pawar, Microbiology	Studies on alkali-tolerant fungi for alkaline protease production and its applications
	Deepak Maurya, Microbiology	Studies on diversity of endophytic actinomycetes from medicinal plants and their bioactivities
Behera BC	Subhash Gaikwad, Botany	Studies on selected macro-lichens and their bioactive constituents for its use as pharmaceutical supplements
	Ruchira Sutar, Botany	Studies on antimicrobial, antioxidative, cardiovascular-protective and cytoprotective potential of selected macro-lichens and their secondary compounds
Rajeshkumar KC	Shruti OP, Botany	Molecular systematics and reappraisal of lignicolous Ascomycota from the Western Ghats of India
	Ansil PA, Botany	Polyphasic taxonomy of lichen family Graphidaceae from the Western Ghats, India
Bioenergy		
Dagar SS	Deore Kasturi, Microbiology	Thermophilic Methanogenic Archaea from Hot Springs and Oil Reservoirs, and Their Application
	Hivarkar Sai, Microbiology	Investigating diversity of thermophilic anaerobic bacteria from hot spring environments for utilization of agricultural biomass
	Bhujbal Prajakta, Microbiology	Development of a sustainable bioprocess for second-generation ethanol production using anaerobic microbes
	Eklare Aditya Santosh, Biotechnology	Exploring the lignocellulolytic machinery of anaerobic fungi for sustainable bioprocessing of agricultural feedstocks using multi-omics approaches
Dhakephalkar PK, Dagar SS	Mishra Roshani Kumari, Microbiology	Phage-Mediated Control of Sulfate-Reducing Bacteria in Oil Reservoirs: Mechanisms and Strategies
	Chandras Siddhi Damodar, Microbiology	Evaluating the potential health benefits and probiotic attributes of Bacillus spp.: in vitro and in silico studies
Dhakephalkar PK	Pisu Vaidehi, Microbiology	Deciphering the potential of anaerobic gut bacteria as next generation probiotics for improved health
Bioprospecting		
Kulkarni PP	Suryavanshi Komal R, Biotechnology	Understanding the role of metal ions in neurodegeneration and inflammation in Alzheimer's disease
	Shete Padmaja A, Biotechnology	Studies on inflammation associated with iron dyshomeostasis and its prevention

Guide, Co-Guide	Student, Subject	Thesis
Developmental Biology		
Patra C	Joshi Bhagyashri, Biotechnology	Role of 'celsr1' in morphogenesis using zebrafish as a model organism
	Wagh Ganesh, Biotechnology	Elucidation of the role of selected secreted molecules in zebrafish development
	Bhakta Swarnav, Biotechnology	Tropomodulin 1 in cardiac morphogenesis
	Punde Ashwini, Biotechnology	Role of matricellular protein in vascularization
Genetics & Plant Breeding		
Patil Ravindra	Chavan Siddhi, Biotechnology	Investigation of the genetic basis of seedlessness in grapes and its impact on biochemical composition in berries
Yashvanthakumar KJ	Pawar Pravin Bhausaheb, Botany	Physiology and Genetics of Drought Tolerance in Diverse Germplasm of Spring Wheat (Triticum aestivum L.)
Oak Manoj	Kawade Sonali, Biochemistry	Gluten protein dynamics and wheat end-use quality
Tetali Sujata	Idhol Bhanudas, Botany	Genetic Diversity, Stability, Heterosis and Combining ability studies in Vegetable Soybean (Glycine max (L.) Merrill)
Nanobioscience		
Gajbhiye V	Aazam Shaikh, Biotechnology	Oncogene repair using splice switching oligonucleotides-nanoparticles complex for the treatment of triple-negative breast cancer
	Surajit Patra	Development of chikungunya virus antigen-loaded nanoparticles as candidate vaccine
	Niladri Haldar	Aptamer-tethered lipid-polymer hybrid nanoparticles-mediated CRISPR-Cas9 delivery for targeted gene knockout in triple-negative breast cancer
	Rajkumar Samanta	CRISPR/Cas9 encapsulated aptamer-decorated lipid-based nanocarriers for targeted gene editing in lung cancer cells
	Devyani Sengar	Studies on reversal of drug resistance in ovarian cancer using nanoparticle-nucleotide complexes
Karpe YA	Pooja Salunke, Biotechnology	Exploring non-pathogenic protozoa as eukaryotic platform for protein expression
	Rohini Nangare, Biotechnology	Development of miRNA, attenuated and mRNA-based candidate vaccines against Chikungunya virus
Rajwade JM	Snehal Kulkarni, Microbiology	Oligonucleotide modified nanoparticles as probes for determining antibiotic resistance associated with point mutations in ESKAPE pathogens

Guide, Co-Guide	Student, Subject	Thesis
Ghormade V	Maheshwari G, Biotechnology	Aptamer based detection of downy and powdery mildew of grapes
	Deepali Chaudhary, Biotechnology	Gene silencing in *Spodoptera litura* through nanocarrier delivered dsRNA
	Vaidehi Bhagwat, Biotechnology	Nano-mediated rapid detection of cucurbit powdery mildew
	Shivangni Singh, Biotechnology	Nano-mediated detection of powdery mildew fungal pathogen in tomato
	Kamal M, Biotechnology	Development of inhalation nanoformulation for delivery of antifungal cell wall and cell membrane inhibitors against Aspergillus lung infections
Bodas DS	Tanmayee Sathe, Biotechnology	Design and development of polymer-lipid membrane for application in organ-on-a-chip
	Pooja Suryawanshi, Biotechnology	Development of Ovarian cancer –co T cells Perfused scaffold with emphasis on immunotherapy
Rahalkar MC	Mohite Jyoti, Microbiology	Utilizing the potential of methane-oxidizing bacteria for methane mitigation and valorization
	Manvi Shubha, Microbiology	In-depth studies on methanotrophs from Indian rice fields focusing on their applications in plant growth promotion and methane mitigation in rice Agriculture
	Pardhi Kajal, Biotechnology	Cultivable methanotrophs from wetlands in Maharashtra for application in the production of carotenoids and as methane mitigation agents
Jadhav SH	Kulkarni Asawari, Biotechnology	Targeting ROS mediated autophagy using nanozyme and miRNA as a novel potential combination therapy for Parkinson's disease

Project Trainees and On-Job Training

Agharkar Research Institute continues to play a key role in capacity building and human resource development through structured training programs at multiple academic levels. Each year, students pursuing Bachelor's and Master's degrees undertake project training at the Institute, with durations ranging from four to twelve months depending on their degree requirements. During 2024–25, ARI provided research opportunities in diverse disciplines including Chemistry, Nanotechnology, Biotechnology, Microbiology, Botany, Zoology, Environmental Sciences, and Plant Breeding & Genetics. A total of eighty-three students from across the country successfully completed their dissertation projects under the expert guidance of ARI scientists.

Aligned with the objectives of the New Education Policy, ARI also offers a well-structured On-Job Training (OJT) program, enabling students to gain practical exposure in a research environment. This program includes participation in advanced research activities, hands-on training with analytical instruments, seminars, and proposal writing workshops. Each student concludes their training by presenting the research work undertaken at the Institute. In 2024–25, over 100 students from various colleges and universities across India completed their OJT at ARI.

राजभाषा

दिल्ली के भारत मंडपम में चुतर्थ अखिल भारतीय राजभाषा सम्मेलन–2024, 14–15 सितम्बर 2024

हिन्दी पखवाड़ा कार्यक्रम, 14–30 सितम्बर 2024

- **पुस्तकालय अनुभाग में हिन्दी पुस्तकों की प्रदर्शनी,** 14–30 सितम्बर 2024
- **व्यंग्यचित्र प्रतियोगिता,** 20 सितम्बर 2024
- **अनुवाद प्रतियोगिता, शुद्ध हिन्दी लेखन प्रतियोगिता,** 23 सितम्बर 2024
- **निबंध लेखन प्रतियोगिता,** 25 सितम्बर 2024

- **वक्तृत्व, स्वरचित कविता, गाने, चुटकुले, अनुभव, आदि का प्रस्तुतिकरण,** 27 सितम्बर 2024
- **वैज्ञानिको द्वारा उनके शोधकार्य का मौखिक प्रस्तुतिकरण प्रतियोगिता,** 30 सितम्बर 2024

हिंदी कार्यशाला (तिमाही)

- **राजभाषा की अभिव्यक्ति सामर्थ्य,** 27.5.2024
  डॉ. बरूण कुमार, निदेशक (राजभाषा), रेल मंत्रालय, नई दिल्ली
- **चिठ्ठी आई है!,** 30.9.2024
  डॉ. रितेश कुमार चौधरी, वैज्ञानिक–ई, आघारकर अनुसंधान संस्थान, पुणे
- **वैज्ञानिक एवं तकनीकी लेखन की भाषा,** 26.12.2024
  डॉ. चंद्र मोहन नौटियाल, पूर्व वैज्ञानिक प्रभारी, बीरबल साहनी पुराविज्ञान संस्थान, लखनऊ
- **तकनीकी अनुवाद एवं अन्य विषय,** 27.3.2025
  श्री अंगेश कुमार, वरिष्ठ प्रबंधक(राजभाषा), यूनियन बैंक ऑफ इंडिया, क्षेत्रीय कार्यालय,पुणे
- **राजभाषा कार्यान्वयन समिति की तिमाही बैठक –** 21.5.2024, 6.9.2024, 9.12.2024, 18.3.2025
- **राष्ट्रीय संयुक्त राजभाषा वैज्ञानिक संगोष्ठी**–2024, 3–4 अप्रैल 202
  पुणे के चार प्रमुख वैज्ञानिक संस्थान, राष्ट्रीय कोशिका विज्ञान केन्द्र, राष्ट्रीय रासायनिक प्रयोगशाला, भारतीय ऊष्णदेशीय मौसम विज्ञान संस्थान और आघारकर अनुसंधान संस्थान द्वारा संयुक्त रूप से किया गया। प्रथम दिन 4 तकनीकी सत्र आयोजित हुए जिसमें कुल 36 प्रस्तुतकर्ताओं ने भाग लिया। दूसरे दिन में कुल 25 प्रस्तुतकर्ताओं ने भाग लिया एवं एक राजभाषा परिचर्चा सत्र हुआ। लगभग 70 से अधिक कार्मिकों ने संगोष्ठी में सहभाग किया।

- **नराकास, पुणे (कार्यालय–2) द्वारा 'कण्ठस्थ अनुवाद सॉफ्टवेयर – जानकारी एवं प्रयोगिक प्रशिक्षण' विषय पर हिन्दी कार्यशाला,** 23.4.2024
  संस्थान के डॉ. तुषार कौशिक एवं श्री. ऋषिकेश ढोबले उपस्थित रहे और प्रशिक्षण प्राप्त किया।

- **स्वच्छता पखवाड़ा,** 1–15 मई 2024
  सभी कर्मचारियों द्वारा हिन्दी में स्वच्छता की शपथ ली गई। वृक्षारोपण कार्यक्रम, स्वच्छता ड्राइव, विशिष्ट व्याख्यान, नारा प्रतियोगिता, भाषण प्रतियोगिता एवं ई–पोस्टर प्रतियोगिता आयोजित की गई। सभी कार्यक्रमों एवं प्रतियोगिताओं का संचालन हिन्दी में किया गया। पखवाड़ा का पोस्टर भी द्विभाषा में तैयार किया गया।

- **अंतरराष्ट्रीय योग दिवस–2024,** 21 मई–21 जून 2024
  कार्यक्रमों का परिपत्र, कार्यसूची, संचालन एवं योगाभ्यास के व्याख्यान हिन्दी में किए गए।

- **राजभाषा कार्यान्वयन की स्थिति की समीक्षा,** 7.6.2024
  राष्ट्रीय रासायनिक प्रयोगशाला में आयोजित नराकास की छमाही बैठक में डॉ. सुष्मिता भट्टाचार्य, उपनिदेशक, राजभाषा विभाग, गृह मंत्रालय, मुंबई द्वारा पुणे के कुल 57 केंद्रीय कार्यालयों की राजभाषा कार्यान्वयन की स्थिति की समीक्षा की गई। पाँच कार्यालयों में ही मूल पत्राचार की स्थिति 100% है जिसमें आघारकर अनुसंधान संस्थान एक है।

- **नगर राजभाषा कार्यान्वयन समिति के तत्वाधान में विभिन्न अंतर–कार्यालयीन प्रतियोगिताओं का आयोजन,** 9 जुलाई–9 अगस्त 2024
  एकल गीत गायन, तात्कालिक भाषण, शब्द ज्ञान, स्व रचित हिन्दी काव्यपाठ, हिन्दी निबंध लेखन आदि प्रतियोगिता आयोजित की गई। संस्थान से पाँच प्रतिभागियों ने प्रतियोगिताओ में भाग लिया। संस्थान के वरिष्ठ वैज्ञानिक डॉ. एस के सिंह जी को दिनांक 9.8.2024 पर हिन्दी वाद–विवाद प्रतियोगिता के मूल्यांकन हेतु आयुध निर्माणी देहू रोड, पुणे द्वारा आमंत्रित किया गया।

- **नशा मुक्त भारत अभियान,** 12 अगस्त 2024
  भारत सरकार के जन जागरूकता अभियान 'नशा मुक्त भारत अभियान' के संबंध में सामाजिक न्याय और अधिकारिता विभाग द्वारा निर्देशों का अनुपालन करते हुए संस्थान के सभी वैज्ञानिकगण, अधिकारी एव कर्मचारियोंने सहभाग किया तथा संस्थान के नोडल अधिकारी डॉ. कुमार भारत भूषण द्वारा हिन्दी में शपथ दिलाई।

- **स्वतंत्रता दिवस,** 15 अगस्त 2024
  समारोह का संचालन हिन्दी में किया गया।

- **चतुर्थ अखिल भारतीय राजभाषा सम्मेलन,** दिल्ली, 14–15 सितम्बर 2024

  संस्थान से सात प्रतिभागी सम्मेलन में उपस्थित रहे।

- **हिन्दी पखवाड़ा,** 14–30 सितम्बर 2024
  प्रतियोगिताएँ (अनुवाद, शुद्ध हिन्दी लेखन, निबंध लेखन, वक्तृत्व, व्यंग्यचित्र, वैज्ञानिक द्वारा उनके शोधकार्य का मौखिक प्रस्तुतिकरण) एवं अन्य कार्यक्रम आयोजित किए गए जिसमें संस्थागत कर्मचारी एवं विद्यार्थियों ने बढ़–चढ़ कर हिस्सा लिया। दिनांक 30.9.2024 को पुरस्कार वितरण समारोह में सभी विजेताओं को प्रमाणपत्र एवं पुरस्कार दिए गए। हिन्दी पुस्तकों और व्यंग्यचित्रों की प्रदर्शनी लगाई गई।

- **संस्थापक समारोह,** 18 नवंबर 2024
  जुलाई–सितंबर 2024 की संस्कृति पत्रिका का विमोचन किया गया जिसमें हिंदी लेख, हिंदी पखवाड़ा की प्रतियोगिताओं की विस्तृत जानकारी तथा छवियाँ लगाई गई।
- **द्वितीय अखिल भारतीय वैज्ञानिक और तकनीकी राजभाषा संगोष्ठी 2024,** 20–21 नवंबर 2024
  तीन वैज्ञानिक और प्रशासनिक अधिकारी ने आर्यभट्ट प्रेक्षण विज्ञान शोध संस्थान (एरीज), नैनीताल में आयोजित संगोष्ठी में भाग लिया। वैज्ञानिकों द्वारा उनके संगठनों में जारी अनुसंधान तथा अन्य कार्यों से संबंधित शोध पत्रों/आलेखों का हिंदी मे प्रस्तुतीकरण किया।
- **प्रशासनिक कार्य हिंदी में**
  हिंदी में प्रवीणता प्राप्त पंद्रह अधिकारियों/कर्मचारियों को अपना समस्त प्रशासनिक कार्य हिंदी में करने के आदेश जारी किए गए हैं।
- **सतर्कता जागरूकता सप्ताह–2024,** 28 अक्टूबर 2024 से 3 नवंबर 2024
  सतर्कता जागरूकता सप्ताह का आयोजन हिंदी में किया गया।
- **विज्ञान एवं प्रौद्योगिकी विभाग में निरीक्षण प्रश्नावली को उपयुक्तत: भरने संबंधी एक दिवसीय कार्यशाला–सह–प्रशिक्षण सत्र,** 20 दिसंबर 2024
  एक वैज्ञानिक और प्रशासन अधिकारी ने भाग लिया।
- **संयुक्त क्षेत्रीय राजभाषा सम्मेलन, जयपुर,** 17 फरवरी 2025
  संस्थान के तीन वैज्ञानिक और प्रशासनिक अधिकारी ने इस सम्मेलन में भाग लिया।
- **गणतंत्र दिवस,** 26 जनवरी 2025
  सूत्र संचालन हिंदी में किया गया।
- **दक्षिण भारत राजभाषा क्षेत्रीय वैज्ञानिक एवं प्रशासनिक सम्मेलन, शिवनपुरा,** 6–7 मार्च 2025
  निदेशक और डॉ. रवीन्द्र पाटिल, वैज्ञानिक–ई ने भाग लिया।
- **मराठी प्रशिक्षण**
- **राजभाषा नीति – त्रि–भाषा नीति का कार्यान्वयन**
  गैर–मराठी भाषी कर्मचारियों के बोलचाल के प्रयोग में मराठी भाषा में गति लाने के उद्देश्य से दिनांक 7 फरवरी 2025 से मराठी प्रशिक्षण कार्यक्रम का आयोजन किया गया। संस्थान के लगभग 22 अधिकारियों एवं कर्मचारियों को प्रशिक्षण दिया जा रहा है। मराठी प्रशिक्षण की कक्षा में व्याख्यान देने हेतु संस्थान के डॉ. गुरूदत्त वाघ, तकनीकी अधिकारी–डी को आमंत्रित किया गया। यह प्रशिक्षण हर सोमवार, बुधवार और शुक्रवार को अनिवार्य रूप से दिया जा रहा हैं।

Participation

India International Science Festival, IIT-Guwahati, 30 November-3 December 2024

Dr Prashant Dhakephalkar, Director, ARI, Dr Virendra Gajbhiye, Dr Kamlesh Jangid, Dr Sudhir Navathe, Dr Navneet Kour, Vaidehi Pisu represented ARI

Events

Swachhata Pakhwada - 2024, 1-15 May 2024

International Day of Yoga - 2024 Celebrations, 21 May-21 June 2024

Guest Speakers -

- Swami Jay Chaitanya, Arsh Vidya Gurukulam, Hrishikesh 31 May 2024
- Dr Kiran Chavan, Manobrahma Foundation, Sanvaad Rehabilitation, Pune 7 June 2024
- Dr R Dhopeshwarkar, Interventional Cardiologist, Pune 19 June 2024

Workshop, Writing and Publishing Skills for Researchers 5, 7, 9 August 2024

Dr Yateendra Joshi, Scientific writing trainer, Copy editor

Har Ghar Tiranga Campaign, 9-15 August 2024

National Space Day Celebrations, 21-23 August 2024

- Painting, quiz and cross-word puzzle, Kendriya Vidyalaya, DIAT Khadakwasala, 21 August 2024; Kendriya Vidyalaya, National Defence Academy, 22 August 2024
- Guest Speaker - Shri Anant Patki, Scientist (Retd), ISRO, 23 August 2024

Swachhata Hi Seva, Special Campaign 4.0, 14 September-1 October 2024

ARI-ENGAGE, 14 October 2024

- Topic: Holistic Leadership: Integrating Self, Team, and Community

Speaker: Dr Rajeev Kumar Mehajan, Expert Member - Technical Commissions, WMO, United Nations; Hon'ble President of India's Nominee - IIT Kharagpur; Distinguished Professor & Strategic Advisor - TIET, India; Former Scientific Advisor – SERB, DST

Vigilance Awareness Week, 28 October-3 November 2024

Fossil Festival, 11-21 November 2024

Founder's Day Celebrations, 18 November 2024

- Guest of Honour - Dr Ashish Lele, Director, CSIR-NCL, Pune
- Chairperson - Dr Nitin Karmalkar, Vice-President, MACS

Seminar, 2 December 2024

Cilia, Crooked Spines and Fertility

Dr Sudipto Roy, Institute of Molecular and Cell Biology, Singapore, Department of Pediatrics, National University of Singapore, Singapore

ARI-ENGAGE, 6 December 2024

- Topic: Role of Visual Media/ SCIENTOONS in Science Writing

Speaker: Dr Pradeep Kumar Srivastava, Former Dy. Director (Sr. Principal Scientist), CSIR-Central Drug Research Institute

Gender sensitivity and POSH, 10 December 2024

Facilitators - Ms Snehal Jadhav & Ms Bhagyashree Karankar, Muktaa Charitable Foundation, Pune

Invited Scientific Talk - 2024, 12 December 2024

- Fusarium, Mycotoxins and Global Food Security
- Prof. Dr John F Leslie, Genetics and Plant Pathology, Kansas State University, USA

Seminar Ancient Groves & Modern Science: Bridging Wisdom in Conservation,

Birth Centenary Commemoration of Botanist Dr VD Vartak, 18 December 2024

Patron ARI was a Patron of the 16th Annual Meeting of Proteomics Society, India and International Conference on Integrated Omics Approaches for Decoding Biological Research, 21-23 November 2024

Extension and Outreach

As part of its continued commitment to knowledge dissemination and community engagement, ARI contributed to science communication and rural development efforts. Research articles authored by ARI scientists featured in the DST Media Cell and various newspapers, garnering wide public attention and outreach. In collaboration with Krishi Vigyan Kendra (KVK), Baramati, ARI organized extension activities under the Scheduled Caste Sub-Plan (SCSP) programme aimed at enhancing agricultural productivity and rural livelihoods. A training session on wheat production and improved varieties was conducted on 13 December 2024 for farmers in Jawalke and Pimpalgaon Unda villages, Ahilyanagar district. Another training session, focused on wheat post-harvest management and distribution of agricultural inputs on 7 March 2025 for farmers from Sonkaswadi, Daund, Pandare, and Anjangaon in Pune district. Additionally, expert advisory content on soybean crop management (for the period 1–15 August 2024) was published on the Lokmat Agro channel.

Personnel

Administrative Information Staff Members as on 31.03.2025

Director

Dr. P.K. Dhakephalkar

Biodiversity & Paleobiology Group

Biodiversity - Fungi

Dr. S.K. Singh, Scientist 'G'
Dr. Rajesh Kumar K.C., Scientist 'E'
Dr. P.N. Singh, Scientist 'E'
Dr. Nischitha R. Scientist 'B'
Dr. Shiwali Rana, Scientist 'B'
Dr. S. B. Gaikwad, Technical Officer 'A'
D.K. Mourya, Laboratory Assistant 'D'
S.S. Lad, Laboratory Assistant 'D'

Biodiversity - Lichens

Dr. B.C. Behera, Scientist 'E'
Dr. B.O. Sharma, Technical Officer 'C'

Biodiversity - Palaeobiology

Dr. T. Kaushik, Scientist 'D'
Dr. P.G. Gamre, Technical Officer 'B'

Biodiversity - Plants and Diatoms

Dr. M.N. Datar, Scientist 'E'
Dr. Karthick B, Scientist 'E'
Dr. R.K. Chaudhary, Scientist 'E'
N.S. Gaikwad, Laboratory Assistant 'C'
S. A. Pardhi, Laboratory Assistant 'B'

Garden

Dr. S.P. Tetali, Scientist 'E' (Additional Charge)
K. H. Sable, Technical Officer 'B'

Bioenergy Group

Dr. K. Jangid, Scientist 'E'
Dr. S.S. Dagar, Scientist 'E'
P.R. Kshirsagar, Scientist 'E'
Dr. N.G. Kapse, Scientist 'B'
Dr. T.D. Lodha, Scientist 'B'
Dr. V.B. Lanjekar, Technical Officer 'B'
S.K. Tiwari, Attendant 'A'

Bioprospecting Group

Dr. P.P. Kulkarni, Scientist 'F'
Dr. P. Srivastava, Scientist 'D'
Dr. N. Kour, Scientist 'B'
Dr. R.J. Waghole, Technical Officer 'A'
Dr. A.V. Misar, Technical Officer 'A'
Dr. P.P. Apte, Laboratory Assistant 'C'

Developmental Biology Group

Dr. A. Ratnaparkhi, Scientist 'F'
Dr. C. Patra, Scientist 'E'
Dr. B.V. Shravage, Scientist 'E'
M. B. Daware, Technical Officer 'C'
R. J. Londhe, Technical Officer 'B'
A. A. Nikam, Laboratory Assistant 'B'

Genetics & Plant Breeding Group

Dr. M. D. Oak, Scientist 'E'
Dr. R. M. Patil, Scientist 'E'
Dr. S. P. Tetali, Scientist 'E'
S. A. Jaybhay, Scientist 'D'
Dr. Y. Kumar K.J., Scientist 'D'
Dr. V. S. Baviskar, Scientist 'D'
Dr. S.P. Nawathe, Scientist 'C'
Dr. Suresha P G., Scientist 'B'
V. M. Khade, Technical Officer 'C'
V. D. Surve, Technical Officer 'C'
Dr. J. H. Bagwan, Technical Officer 'B'
B. D. Idhol, Technical Officer 'B'
S. V. Phalake, Technical Officer 'A'
V. D. Gite, Technical Officer 'A'
B. N. Waghmare, Technical Officer 'A'
A. A. Deshpande, Technical Officer 'A'
S. S. Khairnar, Technical Assistant 'B'
J.S. Sarode, Laboratory Assistant 'D'
D. H. Salunkhe, Laboratory Assistant 'D'
D. N. Bankar, Laboratory Assistant 'C'
S. R. Kachhi, Attendant 'D'
S. V. Ghadge, Attendant 'C'
D. L. Kolte, Attendant 'C

G. S. Rajguru, Attendant 'B'
T. B. Dhurve, Attendant 'B'

Nanobioscience Group

Dr. J.M. Rajwade, Scientist 'F'
Dr. D.S. Bodas, Scientist 'F'
Dr. V. Ghormade, Scientist 'E'
Dr. V. Gajbhiye, Scientist 'E'
Dr. M.C. Rahalkar, Scientist 'E'
Dr. Y. A. Karpe, Scientist 'E'
R.G. Bambe, Technical Officer 'A'
A. Dwivedi, Technical Assistant 'B'
S.S. Waghmare, Laboratory Assistant 'C'

Animal House

Dr. J.M. Rajwade, Scientist 'F' (Additional Charge)
Dr. S.H. Jadhav, Scientist 'E'
V.M. Gosavi, Attendant 'C'

Director Office

Dr. Kumar Bharat Bhushan, Scientist-E
Dr. G.K. Wagh, Technical Officer 'D'
S.P. Balsane, Attendant 'B'

Administration Unit

A. Rahman, Administrative Officer
C. D. Nagpure, Officer 'B'
T.V. Kurhade, Assistant 'B'
D.V. Gawade, Assistant 'B'
R.B. Dhobale, Assistant 'B'
R.S. Shinde, Assistant 'B'
S.S. Shah, Assistant 'B'
R.G. Birwadkar, Assistant 'A'
R.M. Dhandhore, Attendant 'D'
A.B. Kusalkar, Driver
G.H. Agawan, Driver

Accounts Unit

S.A. Tembe, Officer 'B'
M. C. Ranjane, Officer 'A'
S.S. Kalekar, Officer 'A'
S.S. Chavan, Assistant 'B'
S. R. Murade, Assistant 'A'

Purchase Unit

M. B. Tiwari, Officer 'A'
A.V. Wable, Assistant. 'B'
P. D. Gagare, Assistant 'B'
P. S. Velankar, Assistant. 'A'

Store Unit

H.N. Mate, Officer 'B'
M.V. Patake, Assistant 'B'
S.A. Shaikh, Assistant. 'B'
R M. Salunke, Attendant 'D'
K.R. Sathe, Attendant 'C'

Engineering Unit (Civil)

A. Rahman, Administrative Officer (Additional Charge)
P.V. Sawant, Technical Officer 'B'
D.S. Shinde, Technician 'B'

Engineering Unit (IT)

M. Kharade, Technical Officer 'C'
Nayankumara D, Technician 'B'

Library & Information Centre

Dr. Kumar Bharat Bhushan, Scientist-E (Additional Charge)
R.P. Janrao, Assistant Library & Information Officer
S.A. Deshmukh, Senior Library Assistant
R.R. Kale, Library & Information Assistant

Appointment

Dr. Kumar Bharat Bhushan, Scientist-E
Dr. Shiwali Rana, Scientist-B

Promotion

Scientific Staff

Dr. S.K. Singh, Scientist-G
Dr. M.N. Datar, Scientist-E
Shri. P.R. Kshirsagar, Scientist-E
Dr. Sujata Tetali, Scientist-E
Dr. V.S. Baviskar, Scientist-D

Superannuation

J. V. Deshpande, Private Secretary on 31.05.2024

A.G. Dhongade, Senior Private Secretary on 30.06.2024

A.D. Joshi, Officer 'B' on 30.11.2024

Resignation

D.K. Sharma, Finance and Accounts Officer 10.01.2025

Reservation & Concessions

Details of posts filled during 2024-25

Group	SC	ST	OBC	EWS	General	Total
A		-	1		1	2
B	-	-	-		-	-
C	-	-	-		-	-
Total	**-**	**-**	**1**		**1**	**2**

Project Staff/ Students

Project Fellow with Own Fellowship

CSIR Research Associate

Dr. Satishkumar Maurya

CSIR Senior Research Fellow

Ms. Pratyasha Nayak
Ms. Malika Suthar
Ms. Minal Ayachit
Shri. Ansil P. A.
Ms. Sruthi O. P.
Ms. Komal Suryavanshi
Ms. Mrunmayee Kulkarni

CSIR Junior Research Fellow

Shri. Raiping Raleng
Shri. Akash S Davane
Ms. Sweta Gaikwad
Shri. Aranya Paul

UGC Senior Research Fellow

Ms. Aditi Sarawgi
Ms. Kadambari Pawar
Ms Ruchira Sutar
Ms. Deepali Choudhary
Ms. Padmaja Shete
Ms. Vasudha Dwivedi
Shri. Swarnav Bhakta
Ms. Prajakta Bhujbal
Shri. Karan Selarka
Ms. Rohini Nangare

SERB TARE Fellowship

Dr Manojkumar Jadhao SERB TARE Fellowship
Dr Hiralal Sonawane SERB TARE Fellowship
Dr Girish Pendharkar SERB TARE Fellowship
Dr Vinodkumar Ugale SERB TARE Fellowship

Post Doctoral Fellowship

Dr Priyanka Joshi SERB-NPDF

Dr Arindam Bhatacharjee SERB-Ramanujan Fellowship

Dr Abhinandan Patil Ramlingaswami Re-Entry Fellowship

Sponsored Scheme Projects

Field Assistant / Worker

Shri Dipak Dashrath Pawar
Shri. Yogesh Nilakhe

Research Student / Project Assistant

Ms. Prajakta Margale
Ms. Vaidehi Pisu
Shri. Lokesh Mane
Ms. Siddhi Chandras
Ms Nital Nilesh Chankeshwara
Ms Ashlesha Nade
Shri Pranav Wable
Shri Bhagyesh Girigosavi
Ms Snehal Sanjay Chavan
Ms Nimesha Nestley Fernandes
Ms Sanyogita Berde
Mr Pruthviraj Rajabhau Dhaygude
Shri Shirish Kadam

Ms. Pooja Suryavanshi
Ms. Tanmayee Sathe
Ms. Swapnaja Gulawani
Shri. Surajit Patra

UGC Junior Research Fellow

Ms. Kajal Pardhi
Shri. Aditya Eklare
Shri. Harikrishnan K.
Ms. Shweta Kalke
Ms. Asavari Kulkarni
Ms. Laxmi Jadhav

DBT Senior Research Fellow

Shri. Sachin Mapari
Ms. Ashwini Punde
Shri. Rajkumar Samanta
Ms. Snehal Kulkarni

DBT Junior Research Fellow

Ms. Siddhi Chavan
Shri. Niladri Haldar

DST INSPIRE Faculty Fellow

Dr. Pratibha

DST Senior Research Fellow

Ms. Aishwarya Padhye
Ms. Geetika Sukhramani
Ms. Maheswari G.

DST Junior Research Fellow

Shri Balakumar S
Shri Govardhan Choppadandi

DST Women Scientist

Dr. Gargee Pandit

ICMR Senior Research Fellow

Shri. Kiran Nilangekar

SARTHI Junior Research Fellow

Ms. Jyoti Mohite

Ms. Shweta Bapat
Ms. Devyani Sengar
Dr. Mital Thacker
Shri. Shahabaz Pinjari
Ms. Saily Harkal
Shri. Yogeshwaran Murugesan
Ms. Utkarsha Tikhole
Ms. Gauravi Vidhate

Young Professional-II

Dr Monika Soni

Project Associate-II

Shri. Pravin Pawar

Project Associate-I

Shri. Prashant Rupnawar
Shri Prasad Harichand Ade
Ms Arathi
Ms Shravani Kulkarni

Project Scientist

Dr. Durgadevi Aphale
Dr. Deepa Shetty

Research Associate-I

Dr Ankita Deo
Dr Savita Raju Tapase

Research Student

Ms. Vaidehi Bhagwat
Ms. Shivangni Singh

Research Project Associate

Shri Madhan Paramasivam

Sr Project Associate

Dr Nachiket Shankar Umate
Dr Amruta Gaurav Purandare
Dr Param Jeet Saroj

Senior Research Fellow

Ms. Roshani Mishra
Ms Nida Pathan

Mahatma Jyotiba Phule Research Fellow

Ms. Shweta Kumavat

MACS-ARI Project (In-House)

Junior Research Fellow

Shri. Kunal Yadav
Ms. Monali Kadu

Research Student / Project Assistant

Shri. Sarang Bokil
Shri Chandrakant Bande
Ms Vaishnavi Narwade

Sr Project Associate

Dr Saurabh Lahu Gaikwad

Junior Research Fellow

Ms. Vaishnavi Dixit
Ms. Shivanjali Pansare
Shri. Kartik Rangari
Ms. Vrushali Katagade
Shri Mrunal Mhatre
Ms Sirisha Thakare
Ms Meghana Ajit Gunaware
Ms. Algol Niharika
Ms Sakshi Mahajan
Ms Shreya Maity
Ms. Shubha Manvi
Shri. Kamal Mayattu
Shri. Aazam Shaikh

MACS-Agharkar Research Institute, Pune - 411 004

Sponsored Projects List as on 31.03.2025

Sr. No.	Project Code	Project Title	Sponsored By	Investigators
1	**ARI/SP/001**	"All India Co-ordinated Research Project on Soybean" (1.4.1968 onwards)	ICAR-IISR, Indore	Mr. S.A. Jaybhay
2	**ARI/SP/003**	"All India Co-ordinated Wheat Improvement Project" (1.4.1972 onwards)	ICAR-IIWBR, Karnal, Haryana	Dr. Yashavanthakumar K. J.
3	**ARI/SP/033**	"Production of Soybean Breeder Seeds of Annual Oil Seed Crops" (2.2.1988 onwards)	ICAR, New Delhi	Mr. S.A. Jaybhay
4	**ARI/SP/034**	"Front-line Demonstrations of Annual Oil Seed Soybean" (21.2.1989 onwards)	ICAR-IISR, Indore	Mr. S.A. Jaybhay
5	**ARI/SP/043**	"Front-line Demonstrations in Wheat" (1.4.1993 onwards)	ICAR-IIWBR, Karnal, Haryana	Dr. V.S. Baviskar
6	**ARI/SP/096**	"Wheat Breeder Seed Scheme" (1995 Onwards)	ICAR, New Delhi	Dr. Yashavanthakumar K. J.
7	**ARI/SP/302**	"Exploration of pro-regenerative secreted molecules and their mechanistic details in heart regeneration using zebrafish as a model organism" (01.10.2019 to 30.09.2024) Extended upto 31.12.2024	IndiaAlliance, DBT wellcome, Hyderabad	Dr. Chinmoy Patra
8	**ARI/SP/310**	"Characterisation of Genetic Resources: Germplasm Characterization and Trait Discovery in Wheat using Genomics Approaches and its Integration for Improving Climate Resilience, Productivity and Nutritional quality" "Sub Project-3:Evaluation of wheat germplasm for abiotic stresses" (29.02.2020 to 28.02.2025)	DBT, New Delhi	Dr. Yashavanthakumar K. J. Dr. Sudhir Navathe

Sr. No.	Project Code	Project Title	Sponsored By	Investigators
9	**ARI/SP/313**	"SRB-lytic Bacteriophage Mediated Inhibition of SRB Growth and/ or H2S Production at Pre-pilot scale : Prototype Development and Feasibility Assessment" (15.10.2020 to 14.10.2022) Extended upto 14.11.2025	OECT, New Delhi	Dr. P.K. Dhakephalkar
10	**ARI/SP/314**	"Studies on Selected Crinum species from Maharashtra for their Bioprospecting potential against Alzheimer's disease" (08.10.2020 to 07.10.2023) Extended upto 30.09.2024	RGSTC, Mumbai	Dr. P.P. Kulkarni
11	**ARI/SP/316**	"Unravelling the symbiosis of algal and fungal partners in lichen family Graphidaceae and Parmeliaceae from the Western Ghats through polyphasic taxonomic approach and ecological studies" (30.12.2020 to 29.12.2023) Extended upto 29.06.2024	SERB, New Delhi	Dr. Rajesh Kumar K.C.
12	**ARI/SP/317**	"Revisiting the taxonomy of the wild relatives of Sarsaparilla (Smilax L.) in India, developing super-barcodes, and understanding their diversification using phylogenomic tools" (30.12.2020 to 29.12.2023) Extended upto 29.09.2024	SERB, New Delhi	Dr. Ritesh Kumar Choudhary
13	**ARI/SP/318**	"Determine the mechanism of Autophagy-related gene-1 (Atg1) mediated regulation of mitochondrial dynamics during Drosophila oogenesis" (30.12.2020 to 29.12.2023) Extended upto 29.05.2024	SERB, New Delhi	Dr. B.V. Shravage
14	**ARI/SP/320**	"Development of new approaches to live attenuated vaccine against Chikungunya virus" (31.12.2020 to 30.12.2023) Extended upto 30.06.2024	SERB, New Delhi	Dr. Yogesh Karpe
15	**ARI/SP/321**	"Analysis & characterization of probiotic properties of microbial cultures provided by HTBS" (01.02.2021 to 31.01.2024) Extended upto 31.03.2027 "Heterologous gene expression and gene alterations for qualitative/ quantitative improvement of microbial enzyme catalysed biotransformation" (01.01.2023 to 31.12.2023)	Hi Tech BioSciences India Pvt. Ltd., Pune	Dr. P.K. Dhakephalkar Dr. Neelam Kapse
16	**ARI/SP/325**	"Modulation of splicing via aptamer guided targeted nanoconstructs for oncogene RNA repair in triple-negative breast cancer" (25.08.2021 to 24.08.2024)	ICMR, New Delhi	Dr. Virendra Gajbhiye
17	**ARI/SP/326**	"Accelerating Genetic Gains in Maize and Wheat for Improved Livelihood (AGG)" (04.10.2021 to 03.10.2024) Extended upto 30.04.2025	ICAR, New Delhi Bill & Melinda Gates Foundation (BMGF) and the United Kingdom's Department for International Development (DFID)	Dr. Yashavanthakumar K. J. Dr. Sudhir Navathe

Sr. No.	Project Code	Project Title	Sponsored By	Investigators
18	**ARI/SP/327**	"Nano-mediated rapid detection and biocontrol of downy and powdery mildew of grapes and powdery mildew of tomatoes" (01.12.2021 to 30.11.2024) Extended upto 30.05.2025	DBT, New Delhi	Dr. Vandana Ghormade
19	**ARI/SP/328**	"Phylogeny, Diversification and Biogeography of Gomphonemoid Diatoms in the Western Ghats Biodiversity Hotspot, India: A model system for eukaryotic microbes" (20.12.2021 to 19.12.2024) Extended upto 19.04.2025	SERB, New Delhi	Dr. Karthick Balasubramanian
20	**ARI/SP/329**	"Development of functional GluN1/GluN2B-NMDAR antagonists for the treatment of Alzheimer's disease" (06.12.2021 to 05.12.2024) Extended upto 05.03.2025	SERB, New Delhi	Dr. Vinodkumar Ganpatrao Ugale Dr. P.P. Kulkarni
21	**ARI/SP/330**	"Methane Oxidation Potential and Associated Methanotrophic Bacterial Community of Tropical Moist Deciduous Forest and Grassland Soils of Terai Ecozone" (30.12.2021 to 29.12.2024)	SERB, New Delhi	Dr. Monali Rahalkar
22	**ARI/SP/331**	"Reassessment of the taxonomic relationship in the genus Ammonia (Foraminifera) using a combined morphological, ecological, and molecular systematic approaches from around India's coastline" (21.01.2022 to 20.01.2025) Extended upto 20.05.2025	SERB, New Delhi	Dr. Tushar Kaushik
23	**ARI/SP/332**	"Dissection of diversity and complex mechanism of Bipolaris sorokiniana infections in wheat using ToxA-Tsn1 interaction" (28.01.2022 to 27.01.2025) Extended upto 27.07.2025	SERB, New Delhi	Dr. Sudhir Navathe Dr. R.M. Patil Dr. YashavanthaKumar K.J
24	**ARI/SP/333**	"Anticancer activity of bioactive compounds from medicinal mushrooms of Western Ghats of Maharashtra" (13.12.2021 to 12.12.2024) Extended upto 31.03.2025	SERB, New Delhi	Dr. Hiralal Bhaskar Sonawane Dr. B.C. Behera
25	**ARI/SP/334**	"Assessment of potential of multifunctional microbial metabolites in developing 'smart' bandages for treatment of supercicial wounds" (13.12.2021 to 12.12.2024) Extended upto 12.03.2025	SERB, New Delhi	Dr. Girish Bhikanrao Pendharkar Dr. J.M. Rajwade
26	**ARI/SP/335**	"Development of inhalation nanoformulation for bimodal delivery of antifungal cell wall and cell membrane inhibitors against Aspergillus lung infections for reduced systemic toxicity and effective treatment" (02.03.2022 to 01.03.2025) Extended upto 01.09.2025	ICMR, New Delhi	Dr. Vandana Ghormade
27	**ARI/SP/336**	"Candidate Chikungunya virus vaccine To test efficacy of E2 protein-loaded PLGA-PEG nanoparticle as a candidate vaccine in adult and aged mouse model" (01.04.2022 to 31.03.2025)	DST, New Delhi	Dr. Yogesh Karpe Dr. Virendra Gajbhiye

Sr. No.	Project Code	Project Title	Sponsored By	Investigators
28	**ARI/SP/337**	"Demonstration of ARI process for biomethanation of rice straw at 25 L scale and process improvement for enhanced biomethanation at higher solid loading rates at 10000 L scale" (Technology Transfer onwards 24.05.2022) (Project Mode 01.12.2022 to 30.11.2023) Extended upto 31.12.2024	GPS Renewables Private Limited, Bangalore	Dr. P.K. Dhakephalkar Dr. Sumit Singh Dagar
29	**ARI/SP/338**	"Bioprospecting of lichens for assessing the environmental impact level due to quarrying and mining and taxonomic studies of lichens outcrops of the north Western Ghats" (11.10.2022 to 10.10.2025)	DST, New Delhi	Dr. Gargee Pandit Dr. P.P. Kulkarni
30	**ARI/SP/340**	"Culturomics and metagenomics based detection of microbes associated with microbial induced corrosion in subsea pipelines and evaluating the potential of different mitigation strategies" (22.10.2022 to 21.04.2024)	IEOT, ONGC, Panvel	Dr. P.K. Dhakephalkar Dr. Neelam Kapse
31	**ARI/SP/341**	"Application of methanotrophs in rice agriculture for methane mitigation and plant growth promotion". (09.11.2022 to 08.11.2025)	SERB, New Delhi	Dr. Monali Rahalkar
32	**ARI/SP/342**	"Breeding for high yielding elite soybean cultivars with climate/disease resilience and end-use quality traits by multi-parent hybridization and genomic-assisted selection". (01.09.2022 to 31.08.2027)	Regional Center for Biotechnology, Haryana	Dr. Abhinandan Surgonda Patil
33	**ARI/SP/343**	"Phytochemical and pharmacological Investigations of some Selected Unexplored Endemic Species of Apiaceae Family of Northern Western Ghats". (17.10.2022 to 16.10.2025)	SERB, New Delhi	Dr. Manojkumar Maroti Jadhao Dr. Ritesh Kumar Choudhary
34	**ARI/SP/345**	"Mass spectrometry based identification and characterization of mycolic acid derived lipid biomarkers and their application for development of a lateral flow POC device for tuberculosis diagnosis" (15.12.2022 to 14.12.2023) Extended upto 14.09.2025	ICMR, New Delhi	Dr. Vandana Ghormade
35	**ARI/SP/346**	"Understanding synergistic toxicity of Copper, Manganese, and Iron and its implications for neurological disorders" (20.01.2023 to 19.01.2026)	SERB, New Delhi	Dr. P.P. Kulkarni
36	**ARI/SP/348**	"Therapeutic investigations and isolation of bioactives from Haplanthodes species, the wild relatives of Kalmegh" (24.03.2023 to 23.03.2026)	RGSTC, Mumbai	Dr. Ritesh Kumar Choudhary
37	**ARI/SP/349**	"Are gut-dwelling anaerobic fungal lineages between herbivorous ruminants and non-ruminants similar? Investigation using metagenomics and culturomics" (30.05.2023 to 29.05.2026)	SERB, New Delhi	Dr. Sumit Dagar
38	**ARI/SP/350**	"BIOETHANOL FROM BIOMASS - BAMBOO and RICE STRAW" (28.07.2023 to 27.07.2025)	GPS Renewables Private Limited, Bangalore	Dr. P.K. Dhakephalkar Dr. Sumit Singh Dagar Dr. S.K. Singh

Sr. No.	Project Code	Project Title	Sponsored By	Investigators
39	**ARI/SP/351**	"Endo-lysosomal pathway mediated regulation of transsynaptic signaling at the Drosophila synapse" (21.09.2023 to 20.09.2026)	DBT, New Delhi	Dr. Anuradha Ratnaparkhi
40	**ARI/SP/352**	"Understanding The Role Of Endo- Lysosomal Pathway In Early Embryonic Development" (21.09.2023 to 20.09.2026)	CSIR, New Delhi	Dr. Anuradha Ratnaparkhi
41	**ARI/SP/353**	"Multifaceted therapy for cardiac regeneration post infarction through delivery of nucleic acids and bioactives via targeted nanocarriers" (10.10.2023 to 09.10.2026)	SERB, New Delhi	Dr. Virendra Gajbhiye
42	**ARI/SP/354**	"Characterization of farmers' grape varieties and their facilitation for registration with PPVFRA" (16.01.2024 to 15.01.2025)	Protection of Plant Varieties and Farmers' Rights Authority, New Delhi	Dr. Sujata Tetali
43	**ARI/SP/355**	"Fungal diversity, taxonomic characterization and Identification" (01.01.2024 to 31.12.2026)	ICAR - National Bureau of Agriculturally Important Microorganisms, Uttar Pradesh	Dr. S.K. Singh Dr. Shiwali Rana
44	**ARI/SP/356**	"Determine the mechanism of Autophagy-related gene-1 (Atg1) in the metabolism of lipids" (06.02.2024 to 05.02.2027)	ICMR, New Delhi	Dr. B.V. Shravage
45	**ARI/SP/357**	"Investigating cellular and signaling mechanism regulating glial morphogenesis in Drosophila" (14.03.2024 to 13.03.2027)	SERB, New Delhi	Dr. Anuradha Ratnaparkhi
46	**ARI/SP/358**	"Trans Himalayan lake dynamics as sentinels to global climate change" (01.03.2024 to 28.02.2026)	SERB, New Delhi	Dr. Priyanka Joshi Dr. Karthick Balasubramanian
47	**ARI/SP/359**	"Examining Diatom Diversity and their Palaeo environmental Significance in an archaeological Context in selected sites across Tamil Nadu" (03.05.2024 to 02.11.2024) Extended upto 31.03.2025	Department of Archaeology, Tamil Nadu	Dr. Karthick Balasubramanian
48	**ARI/SP/360**	"Understanding functional diversity of the autophagic-lysosomal system during proteostatic stress" "Anusandhan National research Foundation, Ramanujan Fellowship" (13.03.2024 to 12.03.2029)	ANRF (SERB), New Delhi	Dr. Arindam Bhattacharjee
49	**ARI/SP/361**	"A comprehensive feasibility study on biohydrogen production from organic waste at psychrophilic, mesophilic and thermophilic temperature" (23.08.2024 to 22.08.2026)	DRDO, NMRL, Mumbai	Dr. P.K. Dhakephalkar Dr. Sumit Dagar Dr. Tushar Lodha
50	**ARI/SP/362**	"Exploring water quality and addressing heavy metals and emerging pollutants for basin conservation in the ghod region" (26.08.2024 to 25.08.2025)	Gubbi Labs LLP, Karnataka	Dr. Karthick Balasubramanian

Sr. No.	Project Code	Project Title	Sponsored By	Investigators
51	**ARI/SP/363**	"Exploration of the cellular and molecular mechanism underlying the development of cardiomyopathy due to the mutation in the actin-binding protein coding gene fhod3a" (07.09.2024 to 06.09.2027)	Anusandhan National Research Foundation (ANRF), New Delhi	Dr. Chinmoy Patra
52	**ARI/SP/364**	"Sustainable Utilization of Medicinal Plant Resources in Maharashtra" (Coordinating Institute proposal) (04.09.2024 to 03.09.2027)	RGSTC, Mumbai	Dr. Prasad Kulkarni
53	**ARI/SP/364 (1)**	"Development of improved agro-technologies for Punarnava (Boerhavia diffusa), Gokshura (Tribulus terrestris), Vasaka (Justicia adhatoda), Shankhapushpi (Evolvulus alsinoides), and Varun (Crataeva nurvala) for enhanced livelihood of farmers in Maharashtra"(04.09.2024 to 03.09.2027)	RGSTC, Mumbai	Dr. V.S. Baviskar
54	**ARI/SP/364 (2)**	"Action research for Standardizing cultivation, harvesting, and processing practices for higher bioactive content of selected neurotonic medicinal plants using biochar and mycorrhiza inputs" (04.09.2024 to 03.09.2027)	RGSTC, Mumbai	Dr. Sadashiv D. Nimbalkar
55	**ARI/SP/364 (3)**	"The effect of cultivation practices, harvesting time, plant phenology, and genotypic variations on the quality, biomass, and selected active metabolites levels of medicinal plant species [Vitex negundo, Boerhavia diffusa, Tribulus terrestris, Solanum xanthocarpum, Cratavea nurvala, Commiphora wightii, and Celastrus paniculatus], along with promoting medicinal plant farming" (04.09.2024 to 03.09.2027)	RGSTC, Mumbai	Dr. Dhiraj Dilip Naik
56	**ARI/SP/364 (4)**	"Extraction and Isolation of Bioactives from Indigenous Medicinal Plants" (04.09.2024 to 03.09.2027)	RGSTC, Mumbai	Prof. K.S. Laddha
57	**ARI/SP/364 (5)**	"Isolation, Purification, and Identification of Bioactive Principles from Jyotishmati (Celastrus paniculatus), Bramhi (Bacopa monnieri), Shankhapushpi (Evolvulus alsinoides), Varun (Crateva nurvala) Plants"(04.09.2024 to 03.09.2027)	RGSTC, Mumbai	Dr. Pratibha Srivastava
58	**ARI/SP/364 (6)**	"Convert laboratory methods into industrial technology for the extraction of bioactive components from medicinal plants viz. Nirgundi (Vitex negundo), Guggul (Commiphora wightii), Ashwagandha (Withania somnifera), Punarnava (Boerhavia diffusa) and Gokshura (Tribulus terrestris)." (04.09.2024 to 03.09.2027)	RGSTC, Mumbai	Dr. Anita Surendra Patil
59	**ARI/SP/364 (7)**	"Development of Cost-effective, Scalable and Safe Polyherbal Formulation of Ocimum sanctum Linn., Solanum xanthocarpum Schrad and Wendl, Justicia adhatoda L., and Boerhavia diffusa L." (04.09.2024 to 03.09.2027)	RGSTC, Mumbai	Dr. Vinodkumar Ganpatrao Ugale

Sr. No.	Project Code	Project Title	Sponsored By	Investigators
60	**ARI/SP/364 (8)**	“Pharmacology and formulations of Jyotishmati (Celastrus paniculatus), Bramhi (Bacopa monnieri), Shankhapushpi (Evolvulus alsinoids) and Varun (Crateva nurvala)" (04.09.2024 to 03.09.2027)	RGSTC, Mumbai	Dr. M.N. Datar
61	**ARI/SP/364 (9)**	“Designing Effective and Safe Formulations with toxic studies. Species selected for proposal- Nirgundi (Vitex negundo), Guggul (Commiphora wightii), Ashwaganda (Withania somnifera), Gokshura (Tribulus terrestris) and Punarnava (Boerhavia diffusa)" (04.09.2024 to 03.09.2027)	RGSTC, Mumbai	Dr. Prasad Kulkarni
62	**ARI/SP/365**	"Demystifying the impact of virus infection on the blood coagulation system and exploring the possibility of drug repurposing to treat viral diseases." (25.09.2024 to 25.09.2027)	DBT, New Delhi	Dr. Yogesh Karpe
63	**ARI/SP/366**	"Scheduled Caste Sub Plan (SCSP) Program under Wheat Scheme" (29.11.2024 Onwards)	ICAR-IIWBR, Karnal, Haryana	Dr. V.S. Baviskar
64	**ARI/SP/367**	"Potential stemness genes knockout through CRISPR-Cas9 technology in triple-negative breast cancer cells via multitalented nano-hybrids" (20.02.2025 to 19.02.2028)	ICMR, New Delhi	Dr. Virendra Gajbhiye
65	**ARI/SP/368**	"Studies on Brewer's Yeast (Saccharomyces cerevisiae)" (07.02.2025 to 06.11.2025)	DD Enterprises, Pune	Dr. S.K. Singh Dr. Shiwali Rana
66	**ARI/SP/369**	"Unlocking Sustainable Energy: Scaling Up and Pilot Trial of Enhanced Microbial Methane Production from Agricultural residue using anaerobic fungi" (09.01.2025 to 08.01.2027)	DSIR, New Delhi	Dr. P.K. Dhakephalkar Dr. Sumit Dagar
67	**ARI/SP/370**	"Biomonitoring of Restored and Rejuvenated Water Structures" (15.03.2025 to 14.09.2025)	HCL Foundation, Noida	Dr. Karthick Balasubramanian
68	**ARI/SP/371**	"Investigating the Diversity, Distribution, and Traditional Knowledge of Medicinal Plant Species in the Northern Sahyadri Region (Pune, Ahmednagar, Nashik, Dhule and Nandurbar districts) of the Western Ghats, Maharashtra" (27.03.2025 to 26.03.2028)	Maharashtra Gene Bank, Nagpur	Dr. M.N. Datar

Audit Report 2024-25

Maharashtra Association for the Cultivation of Science

Independent Auditors Report

We have audited the accompanying financial statements of Maharashtra Association for the Cultivation of Science, Pune which comprise the Balance Sheet as at March 31, 2025, the Statement of Income and Expenditure, for the year then ended, and a summary of the significant accounting policies and other explanatory information.

In our opinion and to the best of our information and according to the explanations given to us,the aforesaid financial statements give the information required by The Maharashtra Public Trust Act, 1950 (earlier known as "The Bombay Trust Act, 1950") in the manner so required and give a true and fair view in conformity with the accounting principles generally accepted in India: -

i. In the case of Balance Sheet, of the state of affairs of the Trust as at March 31, 2025;

ii. In the case of Income & Expenditure Account, of the Surplus for the year ended on that date.

Basis for Opinion

We conducted our audit in accordance with Standards on Auditing (SAs). Our responsibilities under those Standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are independent of the entity in accordance with the ethical requirements that are relevant to our audit of the financial statements, and we have fulfilled our other responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion and no serious irregularity observed.

Management's Responsibility for the Financial Statements

The Trust's Management is responsible for the matters with respect to the preparation of financial statements that give a true and fair view of the financial position, financial performance of the Trust and in accordance with the accounting principles generally accepted in India.

This responsibility also includes maintenance of adequate accounting records in accordance with the provisions of the Act for safeguarding the assets of the Trust and for preventing and detecting frauds and other irregularities; selection and application of appropriate accounting policies; making judgments and estimates that are reasonable and prudent; and design, implementation and maintenance of adequate internal financial controls, that were operating effectively for ensuring the accuracy and completeness of the accounting records, relevant to the preparation and presentation of the financial statements that give a true and fair view and are free from material misstatement, whether due to fraud or error.

Auditor'sResponsibility

Our responsibility is to express an opinion on the financial statements based on our audit. We have taken into account the provisions of the Act, the accounting and auditing standards and matters which are required to be included in the audit report under the provisions of the Act and the Rules made there under.

An audit involves performing procedures to obtain audit evidence about the amounts and the disclosures in the financial statements. The procedures selected depend on the auditor'sjudgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal financial control relevant to the Trust's preparation of the financial includes evaluating the appropriateness of the accounting policies used and the reasonableness of the accounting estimates made by the Trust's Management, as well as evaluating the overall presentation of the financial statements.

We report that:

1. We have obtained all the information and explanations, which to the best of our knowledge and belief were necessary for the purpose of our Audit.
2. In our opinion, proper books of accounts as required by law have been kept by the institute so far as it appears from our examination of those books.
3. The Balance Sheet and Income and Expenditure Account dealt with by the report are in agreement with the books of accounts.

As per our report of even date
For **M/s A. R. SULAKHE & CO.**
Chartered Accountants
FRN: 110540W

NIKHIL GUGALE
Partner
UDIN: 25177609BMKVSV7295

Place: Pune
Date: 29-August-2025

REPORT OF AN AUDITOR RELATING OF ACCOUNTS AUDITED UNDER SUB SECTION(2) OF SECTION 33 & 34 AND RULE 19 OF THE BOMBAY PUBLIC TRUSTS ACT

Name of the Public Trust: MAHARASHTRA ASSOCIATION FOR THE CULTIVATION OF SCIENCE
For year ending 31st March, 2025

Sr. No.	Particulars	Remarks
A	Whether accounts are maintained regularly and in accordance with the provisions of the Act and the rules.	YES
B	Whether receipts and disbursements are properly and correctly shown in the accounts.	YES
C	Whether the cash balance and vouchers in the custody of the manager or trustee on the date of audit were in agreement with the accounts.	YES
D	Whether all books, deeds, accounts, vouchers or other documents records required by the auditor were produced before him.	YES
E	Whether a register of movable and immovable properties is properly maintained, the changes therein are communicated from time to time to the regional office and the defects and inaccuracies mentioned in the previous audit report have been duly complied within.	YES
F	Whether the manager or trustee or any other person required by the auditor to appear before him did so and furnished the necessary information required by him.	YES
G	Whether any property or funds of the Trust were applied for any object or purpose other than the object or purpose of the Trust	NO
H	Whether tenders were invited for repairs or construction involving expenditure exceeding Rs. 5000/	YES
I	Whether any money of the public trust has been invested contrary to the provisions Section 35	NO
J	Alienation, if any of the immovable property contrary to the provisions of Section 36 which have come to the notice of the auditor.	NO
K	All cases of irregular, illegal or improper expenditure or failure or omission to recover monies or other property belonging to the public trust or of loss or waste of money or other property thereof and whether such expenditure, failure, omission loss or waste was caused in consequence of breach of trust or misapplication or any other misconduct on the part of the trustees or any other person while in the management of the trust.	NO
L	Whether the minutes books of the proceedings of the meeting is maintained.	YES
M	Whether any of the trustees has any interest in the investment of the trust.	NO
N	Whether the irregularities pointed out by the auditors in the accounts of the previous year have been duly complied with by the trustees during the period of audit.	YES
O	Any special matter which the auditor may think fit or necessary to bring to the notice of the Deputy or Assistant Charity Commissioner	NO

As per our report of even date
For **M/s A. R. SULAKHE & CO.**
Chartered Accountants
FRN: 110540W

NIKHIL GUGALE
Partner
UDIN: 25177609BMKVSV7295

Place: Pune
Date: 29-August-2025

MAHARASHTRA ASSOCIATION FOR THE CULTIVATION OF SCIENCE: PUNE-411 004

BALANCE SHEET AS ON 31.03.2025

Amount - Rs.

FUNDS AND LIABILITIES	SCH.	CURRENT YEAR	PREVIOUS YEAR
		Rs.	Rs.
CAPITAL ACCOUNTS	A	1,07,61,721	1,07,61,721
CURRENT LIABILITIES	B	63,85,174	37,17,309
INCOME & EXP.A/C		2,14,76,082	2,13,78,110
TOTAL		**3,86,22,977**	**3,58,57,140**
FIXED ASSETS	C	91,78,435	91,85,586
INVESTMENTS	D	1,91,32,366	1,99,63,949
DEPOSITS & ADVANCES	E	68,23,726	38,78,748
CASH & BANK BALANCES	F	34,88,449	28,28,858
TOTAL		**3,86,22,977**	**3,58,57,140**

The above Balance Sheet to the best of our knowledge and belief contains a true account of the Funds, Liabilities and of the Property and Assets of the Association.

HON. F.& A.O.
M.A.C.S.
अधिकारी 'अ' / 'ब'
(Officer 'A' / 'B')
एम.ए.री.एस.-ए.आर.आय., पुणे-4.
(MACS-ARI, Pune-4.)

HON. Treasurer
M.A.C.S.
TREASURER
Maharashtra Association for the Cultivation of Science
G. G. Agarkar Road, PUNE-411 004.

HON. Secretary
M.A.C.S.
HONORARY SECRETARY
Maharashtra Association for the Cultivation of Science
G. G. Agarkar Road, PUNE-411 004.

As per our report of even date
For **A. R. SULAKHE & CO.**
Chartered Accountants
FRN: 110540W

Nikhil Gugale
Partner
M. NO. 177609

A. R. SULAKHE & CO. FRN: 110540W CHARTERED ACCOUNTANTS

Place: Pune
Date: 29-August-2025

MAHARASHTRA ASSOCIATION FOR THE CULTIVATION OF SCIENCE: PUNE-411 004

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED ON 31.03.2025

Amount - Rs.

EXPENDITURE	CURRENT YEAR Rs.	PREVIOUS YEAR Rs.	INCOME	CURRENT YEAR Rs.	PREVIOUS YEAR Rs.
Depreciation : Land & Building	6,557	7,286	Interest (Realised)		
(By way of provision or adjustment)			On S.B. A/c	13,254	15,340
			On Investments	1,98,624	18,69,630
Establishment Expenses	2,66,332	2,30,095	On HDFC S.B. A/c	77,137	4,37,660
(As per Schedule H)					
Audit fees	-	-	Income from other Sources	1,38,000	2,08,000
			(As per Schedule L)		
Depreciation : Plant &	592	988			
Machinery			Income tax refund received	-	18,352
Expenditure on the object of The Trust	55,561	94,509	(Interest)		
(As per Schedule I)					
Surplus carried over to Balance sheet	97,972	22,16,104			
TOTAL	**4,27,015**	**25,48,982**	**TOTAL**	**4,27,015**	**25,48,982**

We hereby certify that the above income and Expenditure Account is correct to the best of our knowledge and belief.

HON. F.& A.O.
M.A.C.S.

HON. Treasurer
M.A.C.S.

HON. Secretary
M.A.C.S.

As per our report of even date
For **A. R. SULAKHE & CO.**
Chartered Accountants
FRN: 110540W

Nikhil Gugale
Partner
M. NO. 177609

Place: Pune
Date: 29-August-2025

MAHARASHTRA ASSOCIATION FOR THE CULTIVATION OF SCIENCE: PUNE-411 004

STATEMENT OF RECEIPTS & PAYMENTS FOR THE YEAR ENDED ON 31.03.2025

Amount - Rs.

RECEIPTS	SCH	CURRENT YEAR	PREVIOUS YEAR	PAYMENTS	SCH	CURRENT YEAR	PREVIOUS YEAR
		Rs.	Rs.			Rs.	Rs.
Opening Balances	F	28,28,858	19,13,552	Establishment Expenses	H	2,66,332	2,09,490
				Expenditure on Object of Trust	K	25,561	39,666
Interest Received On Savings Bank A/c		90,391	61,781	Indirect Receipt & Payment	J	30,000	60,000
Interest on Investments		7,08,354	9,34,760				
Income tax refund received with interest		-	18,352				
Received from Debtors		50,740	-				
Nisarg Sevak Sanstha			20,000				
Income from Other Sources	G	1,32,000	1,88,000				
Indirect Receipt & Payment	J	-	1,569	Closing Balances		34,88,449	28,28,858
TOTAL		**38,10,343**	**31,38,014**	**TOTAL**		**38,10,343**	**31,38,014**

We hereby certify that the aforesaid statement to be true and correct to the best of our knowledge and belief.

HON. F.& A.O.
M.A.C.S.
अधिकारी 'अ'/'ब'
(Officer 'A'/'B')
म.ए.सं.वि.स.–ए.आर.आय., पुणे–4.
(MACS-ARI, Pune-4.)

HON. Treasurer
M.A.C.S.
TREASURER
Maharashtra Association for the Cultivation of Science
G. G. Agarkar Road, PUNE-411 004.

HON. Secretary
M.A.C.S.
HONORARY SECRETARY
Maharashtra Association for the Cultivation of Science
G. G. Agarkar Road, PUNE-411 004.

As per our report of even date
For **A. R. SULAKHE & CO.**
Chartered Accountants
FRN: 110540W

Nikhil Gugale
Partner
M. NO. 177609

A. R. SULAKHE & CO. FRN: 110540W CHARTERED ACCOUNTANTS

Place: Pune
Date: 29-August-2025

MAHARASHTRA ASSOCIATION FOR THE CULTIVATION OF SCIENCE: PUNE-411 004

SCHEDULE "A" CAPITAL ACCOUNT

Amount - Rs.

PARTICULARS	SUB-SCH	CURRENT YEAR	PREVIOUS YEAR
		Rs.	Rs.
TRUST FUND OR CORPUS	1	1,03,77,874	1,03,77,874
OTHER EARMARKED FUNDS	2	3,83,847	3,83,847
TOTAL(RS.)		**1,07,61,721**	**1,07,61,721**

SCHEDULE "B" CURRENT LIABILITIES

Amount - Rs.

PARTICULARS	SUB-SCH	CURRENT YEAR	PREVIOUS YEAR
		Rs.	Rs.
OTHER LIABILITIES	3	63,85,174	37,17,309
TOTAL(RS.)		**63,85,174**	**37,17,309**

SCHEDULE "C" FIXED ASSETS

Amount - Rs.

PARTICULARS	SUB-SCH	CURRENT YEAR	PREVIOUS YEAR
		Rs.	Rs.
LAND AND BUILDING	5	91,77,535	91,84,092
PLANT AND MACHINERY	5	901	1,493
TOTAL(RS.)		**91,78,435**	**91,85,586**

MAHARASHTRA ASSOCIATION FOR THE CULTIVATION OF SCIENCE: PUNE-411 004

SCHEDULE "A" CAPITAL ACCOUNT

Amount - Rs.

Sr. No.	Name of the Company	Particulars	Date of Investment	Date of maturity	Current Year	Previous Year
					Rs.	Rs.
	SHARES					
1	HINDUSTAN MOTORS LTD.	Shares of 50 ordinary Rs. 10 each	-	-	500	500
		Share certificate No.33932				
		bearing Sr. No.4632651-4632700				
	FIXED DEPOSITS					
1	BANK OF MAHARASHTRA	60088467793	31.12.2023	31.12.2026	3,00,000	3,00,000
		60088467534	31.12.2023	31.12.2026	3,00,000	3,00,000
2	INDIAN BANK	6019228988	28.02.2025	28.02.2026	12,76,635	12,01,641
		6019228671	28.02.2025	28.02.2026	12,76,635	12,01,641
		6056528884	28.07.2024	28.07.2025	2,00,000	2,00,000
4	BANK OF INDIA	50345110007246	24.11.2022	24.11.2024	21,51,778	21,51,778
5	HDFC	50300352429665	13.07.2024	14.07.2025	71,47,178	75,38,397
		50300600778898	05.03.2024	06.03.2026	10,00,000	11,09,145
		50300600781152	05.03.2024	06.03.2026	17,00,000	18,85,545
		50300600779810	05.03.2024	06.03.2026	4,00,000	4,43,658
		50300405767617	26.02.2024	27.02.2026	5,00,000	5,54,497
		50300405767962	26.02.2024	27.02.2026	10,00,000	11,08,991
		50300417029245	10.04.2024	11.04.2026	2,00,000	2,00,000
		50300437838952	14.06.2024	15.06.2026	5,69,640	5,69,640
		50300417031045	10.04.2024	11.04.2026	1,10,000	1,10,000
6	IDFC	10053500553	08.04.2024	21.08.2025	10,00,000	10,88,516
	GRAND TOTAL				**1,91,32,366**	**1,99,63,949**

MAHARASHTRA ASSOCIATION FOR THE CULTIVATION OF SCIENCE: PUNE-411 004.
Schedule to and forming part of Balance Sheet as on 31.03.2025

SCHEDULE "E" : DEPOSITS & ADVANCES

Amount - Rs.

PARTICULARS	CURRENT YEAR		PREVIOUS YEAR	
	AMOUNT	AMOUNT	AMOUNT	AMOUNT
	Rs.	Rs.	Rs.	Rs.
DEPOSITS :				
Telephone Deposit	10,000		10,000	
Deposit with Court	15,000	25,000	15,000	25,000
ADVANCES :				
Advance to staff				
Income Tax Deducted at Source	63,94,662	63,94,662	37,54,188	37,54,188
Trade Receivables :				
ARI	6,000	6,000		
Interest accrued on Investments				
(Subject to confirmation from bank & other agencies)				
As per last Balance Sheet)	99,560		1,12,414	
Less: Realised during the year	6,76,581		12,854	
	(5,77,021)		99,560	
Accrued Interest during the year	9,75,085	3,98,064	-	99,560
TOTAL Rs.		**68,23,726**		**38,78,748**

SCHEDULE "F" CASH & BANK BALANCES

Amount - Rs.

PARTICULARS	CURRENT YEAR		PREVIOUS YEAR	
	OPENING BALANCE	CLOSING BALANCE	OPENING BALANCE	CLOSING BALANCE
	RS.	RS.	RS.	RS.
CASH IN HAND	16,092	16,092	2,218	16,092
BANK :-				
With Bank of Maharashtra	1,04,636	19,560	1,54,103	1,04,636
Erandwana Branch in Savings A/c No.9709				
With Union Bank of India,	4,21,899	4,33,652	4,10,495	4,21,899
F.C.Road Branch in S.B.A/c 48941261091951				
With HDFC SAVING BK A/C NO.50100304122670	22,86,231	30,19,146	13,46,736	22,86,231
TOTAL (RS.)	**28,28,858**	**34,88,449**	**19,13,552**	**28,28,858**

MAHARASHTRA ASSOCIATION FOR THE CULTIVATION OF SCIENCE: PUNE-411 004.
Schedules to and forming part of Statement of Receipts & Payments and
Income & Expenditure account for the year ended on 31.03.2025

SCHEDULE"G" : INCOME FROM OTHER SOURCES

Amount - Rs.

PARTICULARS	CURRENT YEAR		PREVIOUS YEAR	
	INCOME & EXP. ACCOUNT	RECEIPT & PAYMENT	INCOME & EXP. ACCOUNT	RECEIPT & PAYMENT
	RS.	RS.	RS.	RS.
Fee for Home Gardening course	-	1,32,000	-	1,86,000
Life Membership Fees	-	-	-	2,000
TOTAL (RS.)	**-**	**1,32,000**	**-**	**1,88,000**

SCHEDULE "H" : ESTABLISHMENT EXPENSES

Amount - Rs.

PARTICULARS	CURRENT YEAR		PREVIOUS YEAR	
	INCOME & EXP. ACCOUNT	RECEIPT & PAYMENT	INCOME & EXP. ACCOUNT	RECEIPT & PAYMENT
	RS.	RS.	RS.	RS.
Remuneration to Staff	-	-	2,06,795	2,06,795
Meeting Expenses	761	761	6,272	2,695
Legal Fees	45,000	45,000	-	-
Emoluments	2,20,386	2,20,386	-	-
MiscellaneousExpense	-	-	17,017	-
Bank charges	185	185	11	-
TOTAL (RS.)	**2,66,332**	**2,66,332**	**2,30,095**	**2,09,490**

MAHARASHTRA ASSOCIATION FOR THE CULTIVATION OF SCIENCE: PUNE-411 004.
Schedules forming part of Income & Expenditure Account for the year ended on 31.03.2025

SCHEDULE "I" : EXPENDITURE ON THE OBJECT OF THE TRUST

Amount - Rs.

PARTICULARS	CURRENT YEAR	PREVIOUS YEAR
	Rs.	Rs.
Home Garden Course Expenses	55,561	94,509
TOTAL (RS.)	**55,561**	**94,509**

Schedules forming part of Receipt & Payment Account for the year ended on 31.03.2025

SCHEDULE "J" : INDIRECT RECEIPTS & PAYMENTS

Amount - Rs.

PARTICULARS	CURRENT YEAR		PREVIOUS YEAR	
	RECEIPTS	PAYMENTS	RECEIPTS	PAYMENTS
	Rs.	Rs.	Rs.	Rs.
Advance to staff	-	30,000	1,569	60,000
TOTAL (RS.)		**30,000**	**1,569**	**60,000**

SCHEDULE "K" : EXPENDITURE ON THE OBJECT OF THE TRUST

Amount - Rs.

PARTICULARS	CURRENT YEAR	PREVIOUS YEAR
	Rs.	Rs.
Expenditure out of Earmarked Donations	-	-
Home Garden Expenses	25,561	39,666
TOTAL (RS.)	**25,561**	**39,666**

SCHEDULE"L" : INCOME FROM OTHER SOURCES

Amount - Rs.

PARTICULARS	CURRENT YEAR	PREVIOUS YEAR
	RS.	RS.
Fee for Home Gardening Course	1,38,000	1,86,000
Donation	-	20,000
Life Membership Fees	-	2000
TOTAL (RS.)	**1,38,000**	**2,08,000**

MAHARASHTRA ASSOCIATION FOR THE CULTIVATION OF SCIENCE: PUNE-411 004.
Schedules to and forming part of Balance Sheet as on 31.03.2025

SUB SCHEDULE "1" TRUST FUND OR CORPUS

Amount - Rs.

PARTICULARS	CURRENT YEAR	PREVIOUS YEAR
	Rs.	Rs.
Trust/Corpus Fund	1,03,77,874	1,03,77,874
TOTAL(RS.)	**1,03,77,874**	**1,03,77,874**

SUB SCHEDULE "2" OTHER EARMARKED FUNDS

Amount - Rs.

PARTICULARS	CURRENT YEAR	PREVIOUS YEAR
	Rs.	Rs.
Reserve Fund (Created vide resolution No. 16 dated 12.4.1984)	36,926	36,926
Museum Fund (As per Last Balance Sheet)	888	888
Prof. S.P. Agharkar Fund (As per Last Balance Sheet)	14,000	14,000
Prof. S.P. Agharkar Birth Centenary Fund (As per last Balance Sheet)	3,32,033	3,32,033
TOTAL (RS.)	**3,83,847**	**3,83,847**

SUB SCHEDULE "3" OTHER LIABILITIES

Amount - Rs.

PARTICULARS	CURRENT YEAR	PREVIOUS YEAR
	Rs.	Rs.
TDS Payable	63,34,434	37,17,309
GST Payable	7,740	-
Workshop Meeting	43,000	-
TOTAL (RS.)	**63,85,174**	**37,17,309**

SUB SCHEDULE "4" INCOME & EXPENDITURE ACCOUNT

Amount - Rs.

PARTICULARS	CURRENT YEAR		PREVIOUS YEAR	
	Rs.	Rs.	Rs.	Rs.
Opening Balance	2,13,78,110		1,91,62,006	
Surplus carried over to Balance sheet	97,972		22,16,104	
		2,14,76,082		2,13,78,110
TOTAL (RS.)		**2,14,76,082**		**2,13,78,110**

MAHARASHTRA ASSOCIATION FOR THE CULTIVATION OF SCIENCE: PUNE-411 004.
Schedule to and forming part of Balance Sheet as on 31.03.2025

SUB SCHEDULE "5" FIXED ASSETS

Amount - Rs.

Sr No	Assets	Gross block as at 01/04/24	Rate of Dep	Addition > 6 months	Addition < 6 months	Deletions during the year	Total WDV	Accumal ated Depreciation	Depreciation for current year	Net block as at 31/03/25	Net block as at 31/03/24
1	**Land**	91,18,520	0%	-	-	-	91,18,520	-	-	91,18,520	91,18,520
		-								-	-
2	**Building**	81,015	10%	-	-	-	81,015	15,443	6,557	59,015	65,572
		-								-	-
3	**Plant and Machinery**	-								-	-
	Equipments	12	0%	-	-	-	12	-	-	12	12
	Publications	4,115	40%	-	-	-	4,115	2,634	592	889	1,481
	Total	**92,03,662**		**-**	**-**	**-**	**92,03,662**	**18,077**	**7,150**	**91,78,435**	**91,85,586**

MAHARASHTRA ASSOCIATION FOR THE CULTIVATION OF SCIENCE: PUNE-411 004.

Schedule to and forming part of Balance Sheet as on 31.03.2025

SUB SCHEDULE "6" FURNITURE AND DEAD STOCK

Amount - Rs.

PARTICULARS	GROSS BLOCK			DEPRECIATION BLOCK						
	Cost as on 01.04.2024	Additions during the year	Total cost as on 31.03.2025	Rate of Depreciation	Up to 31.03.2025	Dep. On opening Balance	Dep. On the Additions during the	Total Dep.for the Year	Total as on 31.03.2025	WDV as on 31.03.2025
1	2	3	4	5	6	7	8	9	10	11
A)(I) GENERAL										
1. Office Equipment's &										
Furniture & Sports Items	6,18,987		6,18,987	10%	6,18,986	-	-	-	6,18,986	1
					-				-	
2. Apparatus & Equipment's	3,15,076	-	3,15,076	20%	3,15,075	-	-	-	3,15,075	1
					-				-	
3. Electric Fittings	9,870	-	9,870	10%	9,869	-	-	-	9,869	1
					-				-	
4. Books	1,19,522	-	1,19,522	20%	1,19,521	-	-	-	1,19,521	1
					-				-	
5.Y -Type System for Grapes-Hol	1,10,497	-	1,10,497	10%	1,10,496	-	-	-	1,10,496	1
	-				-				-	
6. Construction of Statue	98,090	-	98,090	10%	36,512	6,158	-	6,158	42,670	55,420
SUB TOTAL (A)(I)	**12,72,042**	**-**	**12,72,042**		**12,10,459**	**6,158**	**-**	**6,158**	**12,16,617**	**55,425**
A)(II) SPECIAL PUBLICATIONS										
1. Marathi Publication	4,428	-	4,428	40%	3,191	495	-	495	3,686	742
by Prof. M.N.Kamat										
(Cost of Rs. 1.54)										
2. Enumeration of Plants from	3,154	-	3,154	40%	1,922	493	-	493	2,415	739
Gomantak by Dr.V.D.Vartak										
(Cost of Rs. 3.60)										
SUB-TOTAL (A)(II)	7,582	-	**7,582**		**5,113**	**988**	**-**	988	**6,101**	**1,481**
TOTAL A (I+II)	**12,79,624**	**-**	**12,79,624**		**12,15,572**	**7,145**	**-**	**7,145**	**12,22,718**	**56,907**

PARTICULARS	GROSS BLOCK			DEPRECIATION BLOCK						
	Cost as on 01.04.2024	Additions during the year	Total cost as on 31.03.2025	Rate of Depreciation	Up to 31.03.2025	Dep. On opening Balance	Dep. On the Additions during the	Total Dep.for the Year	Total as on 31.03.2025	WDV as on 31.03.2025
1	2	3	4	5	6	7	8	9	10	11
B) UNIVERSITY OF PUNE										
1. Office Equipment & Furniture	1,300	-	1,300	0%	1,299	-	-	-	1,299	1
	-									
2. Books	25,538	-	25,538	0%	25,537	-	-	-	25,537	1
	-									
3. Aparatus & Equipments	9,914	-	9,914	0%	9,913	-	-	-	9,913	1
TOTAL (B)	**36,752**	**-**	**36,752**		**36,749**	**-**	**-**	**-**	**36,749**	**3**
C) GOVT.OF MAHARASHTRA										
1. Office Equipment & Furniture	1,008	-	1,008	10%	1,007	-	-	-	1,007	1
	-									
2. Apparatus & Equipments	21,363	-	21,363	20%	21,362	-	-	-	21,362	1
	-									
3. Books	1,210	-	1,210	20%	1,209	-	-	-	1,209	1
TOTAL (C)	**23,581**	**-**	**23,581**		**23,578**	**-**	**-**	**-**	**23,578**	**3**
GRAND TOTAL (A+B+C)	**13,39,957**	**-**	**13,39,957**		**12,75,899**	**7,145**	**-**	**7,145**	**12,83,045**	**56,913**

Agharkar Research Institute of Maharashtra Association for the Cultivation of Science

Independent Auditor's Report

To,
The Director,
Agharkar Research Institute of Maharashtra Association for Cultivation of Science

Opinion

We have audited the accompanying financial statements of **Agharkar Research Institute of Maharashtra association for the Cultivation of Science,** situated at Gopal Ganesh Agharkar Road, Pune which comprise the Balance Sheet as at March 31, 2025, the Statement of Income and Expenditure, for the year then ended, and a summary of the significant accounting policies and other explanatory information.

In our opinion and to the best of our information and according to the explanations given to us, subject to the "Emphasis of Matter" para in the report, the aforesaid financial statements give the information required by The Maharashtra Public Trust Act, 1950 (earlier known as "The Bombay Trust Act, 1950") in the manner so required and give a true and fair view in conformity with the accounting principles generally accepted in India: -

i. In the case of Balance Sheet, of the state of affairs of the Trust as at March 31, 2025;

ii. In the case of Income & Expenditure Account, of the Deficit for the year ended on that date.

Basis for opinion

We conducted our audit in accordance with Standards on Auditing (SAs). Our responsibilities under those Standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are independent of the entity in accordance with the ethical requirements that are relevant to our audit of the financial statements, and we have fulfilled our other responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion and no serious irregularity observed.

Management's Responsibility for the Financial Statements

The Institute's Management is responsible for the matters with respect to the preparation of financial statements that give a true and fair view of the financial position, financial performance of the Trust and in accordance with the accounting principles generally accepted in India.

This responsibility also includes maintenance of adequate accounting records in accordance with the provisions of the Act for safeguarding the assets of the Trust and for preventing and detecting frauds and other irregularities; selection and application of appropriate accounting policies; making judgments and estimates that are reasonable and prudent; and design, implementation and maintenance of adequate internal financial controls, that were operating effectively for ensuring the

accuracy and completeness of the accounting records, relevant to the preparation and presentation of the financial statements that give a true and fair view and are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on the financial statements based on our audit. We have taken into account the provisions of the Act, the accounting and auditing standards and matters which are required to be included in the audit report under the provisions of the Act and the Rules made there under.

An audit involves performing procedures to obtain audit evidence about the amounts and the disclosures in the financial statements. The procedures selected depend on the auditor'sjudgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal financial control relevant to the Institute's preparation of the financial statements that give a true and fair view in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on whether the Institute has in place an adequate internal financial controls system over financial reporting and the operating effectiveness of such controls. An audit also includes evaluating the appropriateness of the accounting policies used and the reasonableness of the accounting estimates made by the Institute's Management, as well as evaluating the overall presentation of the financial statements.

Emphasis of Matter

We draw your attention to following matters.

1. Long outstanding balances are appearing under current liabilities, and no confirmations from parties were available for our verification and those balances are being carried forward from earlier years as per the books of accounts of the institute.

    a) We have obtained all the information and explanations, which to the best of our knowledge and belief were necessary for the purpose of our Auditexcept as stated in point no. 1 above.

    b) In our opinion, proper books of accounts as required by law have been kept by the institute so far as it appears from our examination of those books.

    c) The Balance Sheet, Income and Expenditure Account and the Receipts and Payments Account dealt with by the report are in agreement with the books of accounts.

    d) In our opinion, the Balance sheet & Income & Expenditure Account dealt with by this report are in compliance with the accounting standards prescribed by the Institute of Chartered Accountants of India except the Accounting Standards - 5 “Net Profit or Loss for the year, Prior Period items and changes in Accounting Policies”.

    e) There is no separate Reserves and Surplus account maintained by the institute. The Balance of Income & Expenditure i.e. Deficit is transferred to Capital Fund Schedule.

As per our report of even date
For **M/s A. R. SULAKHE & CO.**
Chartered Accountants
FRN: 110540W

NIKHIL GUGALE
Partner
UDIN: 25177609BMKVSV7295

Place: Pune
Date: 29-August-2025

M.A.C.S'S AGHARKAR RESEARCH INSTITUTE PUNE 411004

BALANCE SHEET AS ON 31.03.2025

Amount - Rs.

Particulars	Sch	Current Year (Rs.)	Previous Year (Rs.)
CAPITAL FUND AND LIABILITIES:			
CAPITAL FUND	1	24,10,59,405	24,95,13,646
RESERVES AND SURPLUS	2	18,34,92,658	16,12,03,124
EARMARKED/ENDOWMENT FUNDS	3	7,27,31,821	5,07,45,619
SECURED LOANS AND BORROWINGS	4	-	-
UNSECURED LOANS AND BORROWINGS	5	-	-
DEFERRED CREDIT LIABILITIES	6	-	-
CURRENT LIABILITIES AND PROVISIONS	7	23,95,39,165	21,46,49,512
TOTAL		**73,68,23,049**	**67,61,11,901**
FIXED ASSETS	8	40,84,59,240	37,82,75,209
INVESTMENTS-FROM EARMARKED/ENDOWMENT FUNDS	9	11,16,87,270	10,62,67,168
INVESTMENTS-OTHERS	10	-	-
CURRENT ASSETS,LOANS,ADVANCES ETC.	11	21,66,76,538	19,15,69,524
MISCELLANEOUS EXPENDITURES			
(to the extent not written off or adjusted)			
TOTAL		**73,68,23,049**	**67,61,11,901**
SIGNIFICANT ACCOUNTING POLICIES	24		
CONTINGENT LIABILITIES AND NOTES ON ACCOUNTS	25		

The above Balance Sheet to the best of our knowledge and belief contains a true account of the Funds, Liabilities and of the Property and Assets of the Association.

(S.A. TEMBE)
OFFICER 'B'
MACS-ARI

अधिकारी 'अ' / 'ब'
(Officer 'A' / 'B')
एम.ए.सी.एस. - ए.आर.आय., पुणे - 4.
(MACS-ARI, Pune-4.)

(P.K. DHAKEPHALKAR)
DIRECTOR
MACS-ARI

निदेशक / Director
एम.ए.सी.एस.-ए.आर.आय., पुणे-4.
(MACS-ARI, Pune-4.)

Place: Pune
Date: 29-August-2025

As per our report of even date
For **M/s A. R. SULAKHE & CO.**
Chartered Accountants
FRN: 110540W

NIKHIL GUGALE
Partner
UDIN: 25177609BMKVSV7295

A. R. SULAKHE & CO. FRN: 110540W CHARTERED ACCOUNTANTS

M.A.C.S'S AGHARKAR RESEARCH INSTITUTE PUNE 411004

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED ON 31.03.2025

Amount - Rs.

Particulars	Sch	Current Year	Previous Year
Income			
Income from Sales/Services	12	19,48,651	16,84,516
Grants/Subsidies	13	31,59,84,281	27,69,03,236
Fees/Subscriptions	14	-	-
Income from Investments (Income on Invest. From earmarked/ endowment Funds transferred to Funds)	15	-	-
Income from Royalty,Publications etc.	16	21,600	19,145
Interest Earned	17	-	43,34,311
Other Income	18	62,400	1,24,800
Total (A)		**31,80,16,932**	**28,30,66,008**
Expenditure			
Decrease in stock of Laboratory consumables	19	3,63,465	6,891
Establishment Expenses	20	23,39,26,718	22,90,41,254
Other Administrative Expenses etc.	21	10,52,27,121	7,50,79,516
Expenditure on Grants, Subsidies etc.	22	-	-
Interest	23	-	-
Depreciation (Net Total at the year-end- corresponding to schedule 8)	8	6,12,04,753	5,62,66,520
Total (B)		**40,07,22,058**	**36,03,94,180**
Balance being excess of Expenditure over Income (A-B)		(8,27,05,126)	(7,73,28,172)
CORPUS/CAPITAL FUND		**(8,27,05,126)**	**(7,73,28,172)**
SIGNIFICANT ACCOUNTING POLICIES	24		
CONTINGENT LIABILITIES AND NOTES ON ACCOUNTS	25		

We hereby certify that the above income and Expenditure Account is correct to the best of our knowledge and belief.

(S.A. TEMBE)
OFFICER 'B'
MACS-ARI

अधिकारी 'अ' / 'ब'
(Officer 'A' / 'B')
एम.ए.सी.एस.-ए.आर.आय., पुणे-4.
(MACS-ARI, Pune-4.)

(P.K. DHAKEPHALKAR)
DIRECTOR
MACS-ARI

निदेशक / Director
एम.ए.सी.एस.-ए.आर.आय., पुणे-4.
(MACS-ARI, Pune-4.)

As per our report of even date
For **M/s A. R. SULAKHE & CO.**
Chartered Accountants
FRN: 110540W

NIKHIL GUGALE
Partner
UDIN: 25177609BMKVSV7295

A. R. SULAKHE & CO. FRN: 110540W CHARTERED ACCOUNTANTS

Place: Pune
Date: 29-August-2025

M.A.C.S'S AGHARKAR RESEARCH INSTITUTE PUNE 411004

Schedules forming part of Balance Sheet as at 31.03.2025

Schedule 1 :-Capital Fund

Amount - Rs.

Particulars	Current Year		Previous Year	
	(Rs.)	(Rs.)	(Rs.)	(Rs.)
Capital Fund (Representing Fixed Assets)				
Balance as the beginning of the year	23,23,75,747		22,68,56,835	
Add : Contributions towards Corpus/Capital Fund (Schedule D)	9,13,88,784		8,28,47,084	
Add/ (Deduct) : Balance of Net Income/ (Expenditure)	(8,27,05,126)	24,10,59,405	(7,73,28,172)	23,23,75,747
Capital Grant				
Balance as the beginning of the year	1,71,37,899		40,22,689	
Add: Capital Grant during the year	9,30,00,000		10,35,00,000	
Less: Balance returned to GOI on 31st March (TSA).	1,87,49,115		57,58,653	
Less: Interest Paid F.Y 2022-23 (Cap)	-		17,79,054	
Less: Expenditure during the year	9,13,88,784		8,28,47,084	
		-		1,71,37,899
Balance at the end of the year		**24,10,59,405**		**24,95,13,646**

Schedule 2 :- Reserves & Surplus

Amount - Rs.

Particulars	Current Year		Previous Year	
	(Rs.)	(Rs.)	(Rs.)	(Rs.)
1. Capital Reserve :-				
As per last Account	-		-	
Addition during the year	-		-	
Less:Transfer to Establishment expenses	-	-	-	-
2. Revaluation Reserve :-				
As per last Account	-		-	
Addition during the year	-		-	
Less: Deductions during the year	-	-	-	-
3. Special Reserve : A.R.I. Reserve Fund:-				
As per last Account	-			
Addition during the year (Transfer of Balance of Lab Reserve fund to Special Reserve)			-	
Add: Interest accrued	-		-	
Less: Deductions during the year	-	-	-	-
4. General Reserve (LRF)* :-				
As per last Account	16,12,03,124		14,70,42,154	
Addition during the year	2,22,89,535		1,41,60,970	
Less: Deductions during the year	-	18,34,92,658	-	16,12,03,124
Total (Rs.)		**18,34,92,658**		**16,12,03,124**

* Laboratory Reserve Fund transferred to General Researve (LRF) under regrouping of ledger.

M.A.C.S'S AGHARKAR RESEARCH INSTITUTE PUNE 411004
Schedules forming part of Balance Sheet as at 31.03.2025

SCHEDULE-3 EARMARKED/ENDOWMENT FUNDS

Amount - Rs.

PARTICULARS	FUND-WISE BREAK UP				TOTALS
	Dr. A. B.	Dr. A. D.	Welfare	Current Year	Previous year
	Joshi	Agate	fund		
a) Opening balance of the funds	-	-	-	-	8,84,876
b) Additions to the funds:	-	-	-	-	-
i) Donations/Grants	-	-	-	-	-
ii) Income from investments made on account of funds.	-	-	-	-	12,752
TOTAL (a+b)	**-**	**-**	**-**	**-**	**8,97,628**
c) Utilisation/Expenditure towards objectives of funds	-	-	-	-	-
TOTAL (c)	**-**	**-**	**-**	**-**	**-**
NET BALANCE AS AT THE YEAR-END (a+b-c)	**-**	**-**	**-**	**-**	**8,97,628**
				-	
Add: Balance of Sponsored Projects of Schemes (Liability)	-	-	-	7,18,20,276	4,98,47,991
TOTAL BALANCE AS ON 31.3.2025	**-**	**-**	**-**	**7,18,20,276**	**5,07,45,619**

SCHEDULE 4- SECURED LOANS AND BORROWINGS

Amount - Rs.

Particulars	Current Year		Previous Year	
1. Central Government		-		-
2. State Government (Specify)		-		-
3. Financial Institutions				
a> Term Loans	-		-	
b> Interest Accrued and due	-	-	-	-
4. Banks:				
a> Term Loans	-		-	
- Interest accrued and due	-		-	
b> Other Loans (Specify)	-		-	
- Interest accrued and due	-	-	-	-
5. Other Institutions and Agencies		-		-
6. Debentures and Bonds		-		-
7. Others (Specify)		-		-
TOTAL (Rs.)		-		**-**

Note: Amounts due within one year Nil

M.A.C.S'S AGHARKAR RESEARCH INSTITUTE PUNE 411004

Schedules forming part of Balance Sheet as at 31.03.2025

SCHEDULE 5: UNSECURED LOANS AND BORROWINGS

Amount - Rs.

	Particulars	Current Year		Previous Year	
1	Central Government		-		-
2	State Government (specify)		-		-
3	Financial Institutions		-		-
4	Banks		-		-
	a) Term Loans	-	-	-	-
	b) Other Loans (Specify)	-	-	-	-
5	Other Institutions and Agencies		-		-
6	Debentures and Bonds		-		-
7	Fixed Deposits		-		-
8	Others (Specify)		-		-
	TOTAL (Rs.)		**-**		**-**

SCHEDULE 6: DEFERRED CREDIT LIABILITIES

Amount - Rs.

	Particulars	Current Year		Previous Year	
a)	Acceptance secured by hypothecation				
	of capital equipment and other assets	**-**	**-**	**-**	**-**
b)	Others	**-**	**-**	**-**	**-**
	TOTAL (Rs.)		-		-

Note : Amounts due within one year Nil

M.A.C.S'S AGHARKAR RESEARCH INSTITUTE PUNE 411004

Schedules forming part of Balance Sheet as at 31.03.2025

Schedule 7 :- Current Liablities & Provisions

Amount - Rs.

Particulars	Current Year		Previous Year	
	(Rs.)	(Rs.)	(Rs.)	(Rs.)
A. Current Liabilities-				
1. Acceptances			-	
2. Sundry Creditors:				
a) For Goods		12,73,907		2,74,486
3. Advances Received			-	
4. Interest Accrued but not due on:				
a) Secured Loans/borrowings			-	
b) Unsecured Loans/borrowings			-	
5. Statutory Liabilities:			-	
a) TDS Payable	23,315		1,62,696	
b) GST TDS payable	11,77,758		12,11,725	
c) PF Commissioner A/c	-		-	
d) New Pension Scheme	1,38,270		46,928	
e) State Profession Tax	400	13,39,743	22,000	14,43,349
6. Other Current Liabilities	1,52,74,927	1,52,74,927	1,53,24,928	1,53,24,928
7. Unspent Balance of Grant			-	
8. Earnest Money Deposit	16,60,126		10,54,856	
9. Security Deposit	18,76,299		13,18,449	
10. Other Tution Fees & University Share	71,511		1,51,950	
11. Workshops Meetings etc.	2,68,634		2,10,078	
		38,76,570	-	27,35,333
Total (A)		**2,17,65,147**		**1,97,78,096**
B. PROVISIONS				
1. For Taxation	-		-	
2. Gratuity	10,34,77,067		9,57,88,253	
3. Superannuation/Pension	-		-	
4. Accumulated Leave Encashment	11,39,82,644		9,88,79,256	
5. Trade Warranties/Claims	-		-	
6. Others				
- Audit fees	1,10,400		-	
- Campus maintainance	2,03,907		2,03,907	
Total (B)		**21,77,74,018**		**19,48,71,416**
Total (A+B)		**23,95,39,165**		**21,46,49,512**

Note: Current year provision has been made on the basis of the available grant balance.

M.A.C.S'S AGHARKAR RESEARCH INSTITUTE PUNE 411004

Schedules forming part of Balance Sheet as at 31.03.2025

SCHEDULE 8 FIXED ASSETS

Amount - Rs.

Sr No	Asset	Gross block as at 01/04/2024	Rate of Depreciation	Addition > 6 months	Addition < 6 months	Deletions during the year	Total WDV	Depreciation for current year	Net block as at 31/03/2025	Net block as at 31/03/2024
I	**Land**	1,74,914	0%		-	-	1,74,914	-	1,74,914	1,74,914
II	**Building**	4,95,02,927	10%	-	-	-	4,95,02,927	49,50,293	4,45,52,634	4,95,02,927
III	**Furniture and Fixtures**	3,74,13,644	10%	2,62,235	17,45,991	-	3,94,21,870	38,54,887	3,55,66,983	3,74,13,644
IV	**Plant and Machinery**	-								-
	Computer and Computer software	40,11,882	40%	3,04,973	28,42,922	-	71,59,777	22,95,326	48,64,451	40,11,882
	Vehicles	3,96,964	15%	-	-	-	3,96,964	59,545	3,37,419	3,96,964
	Books	21,75,871	40%	-	6,15,626	-	27,91,497	9,93,474	17,98,024	21,75,871
	Equipments	28,07,86,335	15%	18,73,562	8,37,43,475		36,64,03,372	4,86,79,745	31,77,23,627	28,07,86,335
	Other Fixed assets	24,76,557	15%				24,76,557	3,71,484	21,05,074	24,76,557
V	**Capital WIP**	13,36,115	0%	-	-		13,36,115	-	13,36,115	13,36,115
	Total	**37,82,75,209**		**24,40,770**	**8,89,48,014**	**-**	**46,96,63,993**	**6,12,04,753**	**40,84,59,240**	**37,82,75,209**

M.A.C.S'S AGHARKAR RESEARCH INSTITUTE PUNE 411004

Schedules forming part of Balance Sheet as at 31.03.2025

Schedule 9 :- Investments from Earmarked/ Endowment Funds (Long Term)

Amount - Rs.

Particulars	Current Year	Previous Year
1. In Government Securities	-	-
2. Other approved Securities	-	-
3. Shares	-	-
4. F.D.R. with Indian Bank (Dr.A.B.Joshi Donation)	2,50,000	2,50,000
5. Subsidiaries and Joint Ventures	-	-
6. Others (Fixed Deposits) (Dr. A.D.Agate Donation)	5,001	5,001
(Tech.Dev.Fund A/c:SBI)	11,14,32,269	10,60,12,167
8. Others (FD against LC)	-	-
TOTAL (Rs.)	**11,16,87,270**	**10,62,67,168**

SCHEDULE 10: INVESTMENTS - OTHERS

Amount - Rs.

Particulars	Current Year	Previous Year
In Government Securities	-	-
Other approved Securities	-	-
Shares	-	-
Debentures and Bonds	-	-
Subsidiaries and Joint Ventures	-	-
TOTAL (Rs.)	-	-

M.A.C.S'S AGHARKAR RESEARCH INSTITUTE PUNE 411004

Schedules forming part of Balance Sheet as at 31.03.2025

Schedule 11 :- Current Assets, Loans & Advances

Amount - Rs.

Particulars	Current Year		Previous Year	
	(Rs.)	(Rs.)	(Rs.)	(Rs.)
A. CURRENT ASSETS:				
1. Inventories:				
a) Stores and Spares				
b) Publications	2,95,495		5,90,990	
c) Stock-in-trade of consumables(as taken valued	2,19,850	5,15,345	2,87,820	8,78,810
and certified by the Management)				
2. Sundry Debtors:				
a) Debts Outstanding for a period exceeding six months				
3. Cash balances in hand(including cheques/drafts/	720	720	8,328	8,328
and Imprest)				
4. Bank Balances:				
a) With scheduled Banks				
-On Current Accounts	6,20,74,942		4,90,31,485	
-On Deposit Accounts	-		-	
-On Savings Accounts	88,16,163		10,09,494	
- On Current Accounts (LRF)	6,44,82,093	13,53,73,199	5,60,97,690	10,61,38,670
TOTAL (A)		**13,58,89,264**		**10,70,25,808**
B. LOANS,ADVANCES AND OTHER ASSETS				
1. Loans:				
a) Staff (For HBA, Vehicle Advance and Computer)	-		-	
b) Amount receivable from Schemes	23,44,018	23,44,018	27,49,447	27,49,447
2. Advances and other amounts recoverable in cash				
or in kind or for value to be received:				
a) On Capital & Revenue Expenditure	1,08,377		-	
b) Prepayments(Cash Insurance)			-	
c) Advances to staff (For TA etc.)	8,55,754		8,43,977	
d) Deposits kept with Govt. Agencies (MSEB, Telephone, Gas Cylinder etc.)	23,00,844	32,64,975	17,78,744	26,22,721
3.Income Accrued:				
a) On Investments from Earmarked/Endowment Funds	17,34,963		23,35,553	
4. Income Tax (TDS) Current	16,23,042		21,58,042	
5. GST TDS	-		6,788	
6. GST Input /Service Tax Input *	-		2,48,23,174	
7. Sponsored Projects of Schemes (Asset)	7,18,20,276		4,98,47,991	
		7,51,78,281		7,91,71,548
TOTAL (B)		**8,07,87,274**		**8,45,43,715**
TOTAL (A+B)		**21,66,76,538**		**19,15,69,524**

Note: * GST Input Credit shown last year have been transferred to respective Expenses and Fixed Assets.

M.A.C.S'S AGHARKAR RESEARCH INSTITUTE PUNE 411004
Schedules forming part of Income & Expenditure Account for the year ended 31.03.2025

SCHEDULE 12: INCOME FROM SALES/SERVICES

Amount - Rs.

Particulars	Current Year (Rs.)	Previous Year (Rs.)
1. Income from Sales		
a) Sales of Finished Goods (Farm Produce)	-	-
b) Sale of Raw Material	-	9,060
c) Sale of Scraps	1,88,044	4,94,270
d) Sale of Wistar Rats	27,400	1,56,800
2. Income from Services		
a) Cultural Identification Charges/ Analytical Services	17,33,207	9,83,314
b) Others	-	869
d) Consultancy Services	-	40,203
Total (Rs.)	**19,48,651**	**16,84,516**

SCHEDULE 13: GRANTS/SUBSIDIES

Amount - Rs.

Particulars	Current Year (Rs.)	Previous Year (Rs.)
1. Central Government	**41,20,00,000**	**39,14,00,000**
Grant in Aid General	10,40,00,000	7,97,00,000
Grant in Aid Salary	21,50,00,000	20,82,00,000
Grant in Aid Capital	9,30,00,000	10,35,00,000
Less: Transferred to Schedule 1 (Capital Fund)	9,30,00,000	10,35,00,000
Less: Balance returned to GOI on 31st March (TSA).	30,15,719	1,33,02,475
Total Grant (GIA General & GIA Salary)	**31,59,84,281**	**27,45,97,525**
Add: Unspent balance at the beginning of the year	-	27,52,325
Less: Interest refund back to DST (2022-23)	-	4,46,614
Sub-total	**31,59,84,281**	**27,69,03,236**
2. State Government	-	-
3. Government Agencies	-	-
4. Institutions/Welfare Bodies		
5. Others (Specify)	-	-
Net Surplus of sale of Assets		
Total (Rs.)	**31,59,84,281**	**27,69,03,236**

* Unspent balance of grant is against recurring balance, non-recurring balance is regrouped under Schedule I Capital Fund

M.A.C.S'S AGHARKAR RESEARCH INSTITUTE PUNE 411004
Schedules forming part of Income & Expenditure Account for the year ended 31.03.2025

SCHEDULE 14: FEES/SUBSCRIPTIONS

Amount - Rs.

Particulars	Current Year	Previous Year
	(Rs.)	(Rs.)
1. Entrance Fees (Library Membership fees)	-	-
2. Annual Fees(Licence fees)/Subscriptions	-	-
3. Seminar/Program Fees	-	-
4. Others (Ph.D.Tuition fee, Ph.D.Provisional Admission fee)	-	-
Total (Rs.)	**-**	**-**

SCHEDULE15- INCOME FROM INVESTMENTS:

Amount - Rs.

	INVESTMENT FROM		INVESTMENT - OTHERS	
INCOME FROM INVESTMENTS:	EARMARKED FUND			
(Income on Invest. From Earmarked/Endowment Funds transferred to Funds.)	**Current**	**Previous**	**Current**	**Previous**
	Year	**Year**	**Year**	**Year**
1. Interest				
a> On Govt. Securities	-	-	-	-
b> Other Bonds/Debentures	-	-	-	-
2. Dividends.				
a> On Shares	-	-	-	-
b> On Mutual Fund Securities	-	-	-	-
3. Rents	-	-	-	-
4. Others(Interest on bank deposits)	-	-	-	-
TOTAL (Rs.)	-	-	-	-
TRANSFERRED TO EARMARKED/ENDOWMENT FUND	-	-	-	-

M.A.C.S'S AGHARKAR RESEARCH INSTITUTE PUNE 411004
Schedules forming part of Income & Expenditure Account for the year ended 31.03.2025

SCHEDULE 16: INCOME FROM ROYALTY, PUBLICTIONS, ETC.

Amount - Rs.

Particulars	Current Year (Rs.)	Previous Year (Rs.)
1. Income from Royalty	-	-
2. Income from Publications	-	-
3. Others (Sale of Tender Forms/I Cards)	-	-
4. Application Money	21,600	19,145
Total (Rs.)	**21,600**	**19,145**

SCHEDULE 17: INTEREST EARNED

Amount - Rs.

Particulars	Current Year (Rs.)	Previous Year (Rs.)
1. On Term Deposits		
a) With Scheduled Banks	-	-
b) With Non-Scheduled Banks	-	-
2. On Saving Accounts		
a) With Scheduled Banks	-	42,54,087
b) With Non-Scheduled Banks *	**-**	**-**
3. On Loans		
a) Employees/Staff (On HBA,Vehicle and Computer Advance)	-	-
b) Interest Received on L.C.	-	79,701
4. Penal Interest	-	523
Total (Rs.)	**-**	**43,34,311**

* Interest earned during the year on saving/current account transferred to General Reserve (LRF)

M.A.C.S'S AGHARKAR RESEARCH INSTITUTE PUNE 411004
Schedules forming part of Income & Expenditure Account for the year ended 31.03.2025

SCHEDULE 18 : OTHER INCOME

Amount - Rs.

Particulars	Current Year (Rs.)	Previous Year (Rs.)
1) Profit on Sale/Disposal of Assets:		
a) Owned Assets	-	-
b) Assets acquired out of grants, or received free of cost		
2) Export Incentives realized	-	-
3) Fees for Miscellaneous Services	-	-
4) Miscellaneous Income	62,400	1,24,800
Total (Rs.)	**62,400**	**1,24,800**

SCHEDULE 19: INCREASE/(DECREASE) IN THE STOCK OF FINISHED GOODS & WORK IN PROGRESS

Amount - Rs.

Particulars	Current Year (Rs.)	Previous Year (Rs.)
a) Closing stock		
- Laboratory Consumables	2,19,850	2,87,820
- Publications	2,95,495	5,90,990
	5,15,345	8,78,810
b) Less: Opening Stock		
- Laboratory Consumables	2,87,820	2,94,611
- Publications	5,90,990	5,91,090
	8,78,810	8,85,701
Net Increase/(Decrease)	**(3,63,465)**	**(6,891)**

M.A.C.S'S AGHARKAR RESEARCH INSTITUTE PUNE 411004
Schedules forming part of Income & Expenditure Account for the year ended 31.03.2025

SCHEDULE 20: ESTABLISHMENT EXPENSES

Amount - Rs.

Particulars	Current Year (Rs.)	Previous Year (Rs.)
1) Salaries and Wages	17,77,82,198	15,90,43,178
2) Allowances and Bonus	21,74,077	18,56,000
3) Contribution to Provident Fund & New Pension Scheme	1,88,02,521	1,68,94,089
4) Contribution to Other Fund (D.L.I.F.)	1,89,978	1,80,491
5) Staff Welfare Expenses	16,06,921	16,50,248
6) Expenses on Employees Retirement and Terminal Benefits	3,04,51,953	4,54,10,208
7) Stipend to Research & Fellowship Students	15,77,295	21,58,889
8) Encashment of Earned Leave for LTC	13,41,775	18,48,151
TOTAL	**23,39,26,718**	**22,90,41,254**

M.A.C.S'S AGHARKAR RESEARCH INSTITUTE PUNE 411004
Schedules forming part of Income & Expenditure Account for the year ended 31.03.2025

SCHEDULE 21: OTHER ADMINISTRATIVE EXPENSES

Amount - Rs.

Particulars	Current Year (Rs.)	Previous Year (Rs.)
Advertisement & Publicity	3,22,237	3,51,310
Auditors Remuneration	1,10,400	-
Electricity & Power	1,34,72,525	1,31,10,160
Exhibition Organised By ARI	59,800	1,65,100
Farm Expenses	63,16,494	36,18,597
Hospitality Expenses	5,83,251	6,10,166
Legal & Professional Fess	19,15,655	16,94,583
Other Office Expenses	15,26,275	6,82,730
Postage, Telephone & Communication	3,27,327	2,55,625
Printing & Stationery	8,68,261	8,59,785
Purchases Of Chemicals & Glassware	4,12,51,116	1,84,45,458
Rent Rates & Taxes	17,63,226	21,44,952
Repairs & Maintenance	1,10,56,484	1,16,01,977
Retired Staff Medical Expenses	10,90,284	7,60,659
Security & Labour Expenses	1,46,08,600	1,39,90,941
Seminar /Workshop Expenses	28,31,932	15,10,092
Subscription Fees	17,42,801	18,21,043
Travelling & Conveyance	20,93,809	12,89,404
Vehicle Running and Maint Exps	1,62,725	1,76,913
Water Charges	19,40,872	15,16,662
Commission To Agency	-	43,187
Publication	7,10,697	-
Other Staff Expenses	4,72,350	3,98,314
Course fees for various programms	-	31,860
TOTAL (Rs.)	**10,52,27,121**	**7,50,79,516**

M.A.C.S'S AGHARKAR RESEARCH INSTITUTE PUNE 411004
Schedules forming part of Income & Expenditure Account for the year ended 31.03.2025

SCHEDULE 22 : EXPENDITURE ON GRANTS, SUBSIDIES ETC.

Amount - Rs.

Particulars		Current Year		Previous Year	
a)	Grants given to Institutions/Organisation	-	-	-	-
b)	Subsidies given to Institutions/Organisations	-	-	-	-
TOTAL (Rs.)			**-**	**-**	**-**

SCHEDULE 23 : INTEREST

Amount - Rs.

Particulars		Current Year		Previous Year	
a)	On Fixed Loans	-	-	-	-
b)	On Other Loans (including Bank Charges)	-	-	-	-
c)	Others (Specify)				
TOTAL (Rs.)			**-**		**-**

M.A.C.S'S AGHARKAR RESEARCH INSTITUTE PUNE 411004
Schedules forming part of Income & Expenditure Account for the year ended 31.03.2025

SCHEDULE D :- TRANSFER TO CAPITAL ACCOUNT

Amount - Rs.

Particulars	Current Year		Previous Year	
	Rs.		Rs.	
Other Fixed Assets				
Books	6,15,625		11,61,019	
Computer / Peripherials/Softwares	31,47,895		32,48,792	
Office Furniture & Dead Stock	20,08,225		1,05,12,464	
App. & Equipments	8,56,17,037		6,56,03,930	
Renovation of Committee Room (Equipment & Furniture)	-		23,20,880	
Total (Rs.)		**9,13,88,784**		**8,28,47,084**

As per our report of even date
For **M/s A. R. SULAKHE & CO.**
Chartered Accountants
FRN: 110540W

(S.A. TEMBE)
OFFICER 'B'
MACS-ARI

अधिकारी 'अ' / 'ब'
(Officer 'A' / 'B')
एम.ए.सी.एस.-ए.आर.आय., पुणे-4.
(MACS-ARI, Pune-4.)

(P.K. DHAKEPHALKAR)
DIRECTOR
MACS-ARI

निदेशक / Director
एम.ए.सी.एस.-ए.आर.आय., पुणे-4.
(MACS-ARI, Pune-4.)

NIKHIL GUGALE
Partner
UDIN: 25177609BMKVSV7295

A. R. SULAKHE & CO. FRN: 110540W CHARTERED ACCOUNTANTS

Place: Pune
Date: 29-August-2025

FORM OF FINANCIAL STATEMENTS: Non –profit making organization

Name of Entity: MACS's Agharkar Research Institute Pune, 411004

Schedules forming part of the Accounts for the period ended 31st March 2025

SCHEDULE: 24 SIGNIFICANT ACCOUNTING POLICIES

a. Accounting Convention:

The Financial statements are prepared under the historical cost convention and in accordance with the applicable Accounting Standards except where otherwise stated. Accrual system of accounting is generally followed to record the transaction in the financial statements.

b. Fixed Assets:

Fixed assets are stated at their original cost of acquisition, less depreciation.

c. Method of Depreciation:

Depreciation has been provided for on written down value method as specified in the Income Tax Act, 1961.

It is not possible for us to verify the actual date of asset put to use and hence the same has been taken on the basis of information and explanation given by the management. Accordingly, depreciation is calculated irrespective of put to use for the whole year.

d. Extra-ordinary Items, Prior Period Items, Changes in Accounting Policies:

On the basis of information and explanation given by the management Extra-Ordinary Items, Prior Period Items, Changes in Accounting Policies are separately disclosed in the financial Statement but are integrated through various items appearing under the same.

e. Foreign Currency Transactions:

Transactions denominated in foreign currency are accounted as the exchange rate prevailing at the date of the transaction; however foreign exchange gain loss is not calculated and accounted for.

f. Investments:

1. Long term investments are valued at cost and where required, provision is made for permanent diminution in the value of such investment.
2. Investment classified as "Current" is valued at cost and market value.
3. Cost means acquisition cost which includes acquisition expenses like brokerage, transfer stamp, etc.

g. Revenue Recognition:

1. All Revenue receipts are on accrual basis.
2. All Expenses are generally accounted on accrual basis.

h. Accounting for Government Grants:

1. Government grants of the nature of contribution towards capital cost of setting projects are transferred to Capital Fund

i. Retirement Benefits:

1. Generally, liability towards gratuity payable on death/retirement and leave encashment of the employees is provided based on Actuarial Valuation.
2. Provision for accumulated leave encashment benefit to the employees is accrued and computed on the assumption that the employees are entitled to receive the benefit as each year end which is also done on Actuarial Valuation.

j. Capitalization:

1. All direct expenses attributable to fixed asset acquired are capitalized.

As per our report of even date
For **M/s A. R. SULAKHE & CO.**
Chartered Accountants
FRN: 110540W

(S.A. TEMBE)
OFFICER 'B'
MACS-ARI

अधिकारी 'अ' / 'ब'
(Officer 'A' / 'B')
एम.ए.सी.एस.-ए.आर.आय., पुणे-4.
(MACS-ARI, Pune-4.)

(P.K. DHAKEPHALKAR)
DIRECTOR
MACS-ARI

निदेशक / Director
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(MACS-ARI, Pune-4.)

NIKHIL GUGALE
Partner
UDIN: 25177609BMKVSV7295

A. R. SULAKHE & CO. FRN: 110540W CHARTERED ACCOUNTANTS

Place: Pune
Date: 29-August-2025

FORM OF FINANCIAL STATEMENTS: Non –profit making organization

Name of Entity: MACS's Agharkar Research Institute Pune, 411004

Schedules forming part of the Accounts for the period ended 31st March 2025

SCHEDULE 25: CONTINGENT LIABILITIES AND NOTES ON ACCOUNTS

1. Contingent liability:

a) Claims against the entity not acknowledge as Debts-Nil (Previous Year-Nil)

b) In respect of:

- Bank guarantee given by on behalf of the entity -N.A. (Previous Year-Nil)
- Letter of credit opened by bank on behalf of the entity -Nil (Previous Year- Nil)
- Bill discounted with banks -Nil (Previous Year-Nil)

c) Disputed demands in respect of:

- Income tax -Nil (previous Year-Nil) Sales tax -Nil (Previous Year-Nil)
- Municipal Taxes -Nil (Previous Year-Nil)

d) In respect of claims from parties for non-execution of orders, but contested by the entity Nil (Previous Year-Nil)

2. Capital Commitments:

Estimated value of contracts remaining to be executed on capital account and not provided for (Net of Advances)-Nil (Previous Year)-Nil

3. Lease obligation

Further obligation for rental under finance lease arrangements for plant and machinery is Nil (previous Year Nil)

4. Current Assets, Loans and Advances:

In the opinion of the management, the current assets, loans and advances have a value on realization in the ordinary course of business, equal to the aggregate amount shown in the Balance Sheet. Some of balance of sundry debtors, deposits, loans and advances are subject to confirmation from the respective parties and consequential reconciliation adjustments arising there from, if any

5. Taxation

In view of there being no taxable income under Income Tax Act 1961, No provision for income tax has been considered necessary. In view of this, no disclosure is required as per accounting standards -22 issued by The Institute of Chartered Accountants of India (ICAI).

6. Grants:

Grants are recognized on receipts. Grants received from Department of Science & Technology (DST) for Creation of Capital Assets are treated as Capital Fund of the Institute. Grants received for GIA General and GIB Salaries are treated as of revenue nature and shown under Income & Expenditure Account.

7. Retirement Benefit:

Generally, liability towards gratuity payable on death/retirement of employees is provided based on Actuarial Valuation and provision for accumulated leave encashment benefit to the employees is accrued and computed on the assumption that employees are entitled to receive the benefit at each year end which is also done on Actuarial Valuation.

The principle assumption used in determining the gratuity and leave encashment obligation is as per below: -

Sr. No.	Particular	Gratuity	Leave Encashment
1	Withdrawal Rate	3.00%	3.00%
2	Discounting Rate	6.78%	6.78%
3	Future Salary Rise	10.00%	10.00%
4	Encashment Rate while in service	-	5.00%

The position of gratuity payable on death/retirement of employees and leave encashment as on 31st March, 2025 is as below: -

Particulars	Provision for Gratuity	Provision for Leave Encashment
Opening balance as on 1st April 2024	9,57,88,253	9,88,79,256
Add:- Addition during the year 2024-25	76,88,814	1,51,03,388
Less:- Deduction during the year 2024-25	---------	---------
Closing Balance as on 31st March 2025	**10,34,77,067**	**11,39,82,644**

8. Impairment of Assets:

As per Accounting Standard-28 "Impairment of Assets" issued by the institute of Chartered India, comes in to effect, in respect of accounting commencing on or after 1st April, 2005. We have relied upon the management on the matters related to impairment of assets, in view of management there are no impairment losses.

9. Previous year figures are rearranged, recast or regrouped wherever necessary, to make them comparable with those of the year under audit.

10. Provisions are recognized when the firm has present obligation as a result of past event; it is more likely that an outflow of resources will be required to settle the obligation; and the amount has been reliably estimated.

11. In case of items debited to Income and Expenditure account, it was informed to us that the expenditure is not of capital nature.

12. Depreciation on fixed assets has been provided on written down method (WDV) as per the rates prescribed under Income Tax Act, 1961. Assets are regrouped as per the requirements of the Act wherever required.

13. Interest earned on grants-in-aid is payable to Department of Science & Technology (DST) as per Rule 230(8) of GFR, 2017.

14. There is no separate Corpus Fund created by the Institute, it is the balance of Income & Expenditure Account i.e Surplus/ Deficit and expenditure done for purchase of equipments during the financial year is transferred to Capital Fund Schedule.

15. Current year provision are made on bases of available grant balance.

16. Unspent balance of grant is against recurring balance & non-recurring balance is regrouped under Schedule I Capital Fund.

As per our report of even date
For **M/s A. R. SULAKHE & CO.**
Chartered Accountants
FRN: 110540W

(S.A. TEMBE)
OFFICER 'B'
MACS-ARI

अधिकारी 'अ' / 'ब'
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एम.ए.सी.एस. – ए.आर.आय., पुणे – 4.
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(P.K. DHAKEPHALKAR)
DIRECTOR
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(MACS-ARI, Pune-4.)

NIKHIL GUGALE
Partner
UDIN: 25177609BMKVSV7295

A. R. SULAKHE & CO. FRN : 110540W CHARTERED ACCOUNTANTS

Place: Pune
Date: 29-August-2025

Maharashtra Association for the Cultivation of Science
Agharkar Research Institute

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