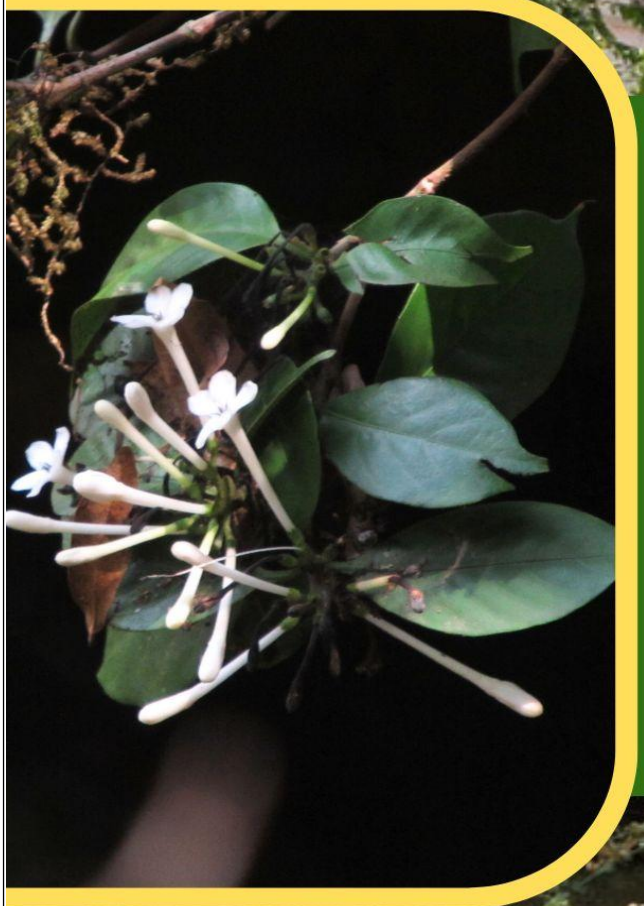
TDU

2024



ANNUAL REPORT

Annual Report
2024

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Report Released
March 25

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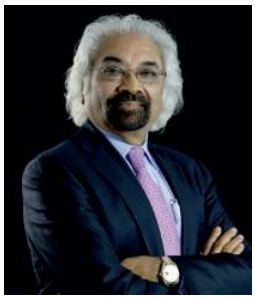


We expect readers will find the annual report for 2024 interesting. It covers TDU programs ranging from community health to conservation practice and clinical practice to food sciences including research on cognition and glucose metabolism. In this message we are not going to highlight various elements of this year's report. We would instead like to provide the reader with TDU's perspective of a modern university.

We begin building this perspective for the reader with critical observations of a well-known and respected educationist who recently spent half a day at the campus. We have several visitors every month but we have specially chosen the sharp feedback from this recent visitor who frankly observed that "TDU did not appear to be moulding itself into a model of a modern university".

He justified his observation on the ground that TDU does not offer the latest innovative UG and PG programs that are today being offered by leading mainstream private universities in India and abroad. He was dismissal about the outdated content and form of UG and PG programs in government run State universities with exceptions like IIT's, IISER's and so on.

He asked why TDU had not yet initiated design and delivery of the *latest modern liberal arts program*, seeded in America. This program as readers may know, has content and forms of education that has broken out of conventional categories of subjects. Students at the UG level can today select a wide variety and more importantly diverse combination of subjects. A UG student can select for example, music, theatre, mathematics, physics and economics as one possible combination, amongst many others. Such combinations are not possible in the structure of older university systems which force students to pursue limited combinations of subjects under watertight categories like social sciences, humanities, or a limited range of disciplines in natural sciences or exclusively law, architecture, engineering, design, finance or at another extreme to pursue in isolation the fine or performing arts. The modern liberal arts program has broken all these siloed offerings in conventional education. Several well-known private universities enrol a few hundred students paying relatively high fees, that cover faculty salaries at market rates in multi-disciplinary programs, in creative combinations.

He was also disappointed that the TDU knowledge agenda was limited to the Health Science space and even in this space it appeared to be enmeshed in a strange cross-cultural field called Ayurveda-Biology. Furthermore, it possessed a negligible institutional corpus fund.

We explained that TDU Founders were not well-endowed business folk or philanthropists who modeled the university on American and European standards and hired talented faculty to execute. This is perhaps because its founders were middle class critics of mainstream education, who had uncharacteristically worked as volunteers for decades in social transformation in rural and tribal areas. They only possessed real world experience about the effectiveness of indigenous knowledge inspired by native world views of nature that that in fact guide the lives of millions of Indians. This reality is hardly realized in mainstream education which has its entire geneses in western cultural and intellectual traditions.

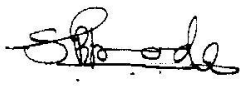
The founders also happened to have interacted largely with indigenous traditions in healthcare based on the use of medicinal plants, which continue to support even today, the needs of food, nutrition, primary and secondary healthcare for majority of Indians. Yet over 90% of public and private healthcare funding has been invested for the last 150 years in a health system borrowed from UK.

Due to this unusual genesis of TDU, it is centrally focused, to begin with on demonstrating the contemporary relevance of the widespread indigenous knowledge heritage. In future TDU would certainly endeavour to expand its domains.

A university platform is critical for the task of revitalization of indigenous knowledge as universities are the most cost-effective educational instruments for advancing any knowledge agenda. TDU has not borrowed or copied the latest international educational models because it is rooted in Indian social reality. It is remains poorly endowed because indigenous knowledge is not yet an agenda supported substantially by the State or private sector. The annual report of TDU is today confined to the health space because of limitations of financial and human resources.

The field of Ayurveda-Biology is a new outreach, research and education field which TDU pursues in that sequence because it is the only way to build realistic content and form to education in health sciences in the Indian context.

In future TDU and other universities with similar inspiration and commitment to India's social, ecological and cultural realities could expand and more importantly contemporize indigenous knowledge programs in several other domains in which Indians have contributed. These are fields like mathematics, logic, literature, linguistics, architecture, fine and performing arts, design, agriculture, metallurgy, law, social order, music, philosophy and so on.



Sam Pitroda
Chancellor

Darshan Shankar
Vice Chancellor

RESEARCH & OUTREACH

COMMUNITY HEALTH

Projects undertaken during the year: 04 Projects and 1 Certification course

Sl. No	Title of research/outreach/ education projects implemented during 2024	Source of funding	Team members associated with each project
1.	Voluntary Certification Scheme for Traditional Community Healthcare Providers (VCSTCHP)	Sponsored & Self-funded	Dr. Prakash BN, Dr. Swathi A, Mr. Raghavendra M, Dr. Sreelakshmi TJ, Dr. Bhanupriya, Dr. Chaitra Vaidya, Dr. Jishamol Shaji, Dr. Akhilesan V, Dr. Inde T G, Dr. Girish Kumar, Dr. Arun Bhanu, Dr. Nithin GN, Dr. Naresh, Dr. Nidhi Kanwar.Dr. Vaishnavi CG, Krupali Mohanty, Shubhashree Sahoo,Dr. Jagathbandu
2.	Evaluation of Add-on value of Iron-Rich Snack with Iron Folic Acid in the Management of Iron-Deficiency Anaemia: A Cluster-Randomized Controlled Trial	ICMR-National Institute of Traditional Medicine (NITM)	Dr. Prakash BN, Dr. Subrahmanya Kumar K, Mr. Manoj Mathpati, Dr. Nithin GN, Dr. Swathi A, Dr. Sandra Das, Dr. Dipin VM
3.	Anemia: Community Awareness Program: Empowering Rural Communities to Manage Anemia through Integrated Knowledge, Local Resources and Practices	Rural India Supporting Trust (RIST)	Dr. BN Prakash, Dr. Sandra Das Dr. Dipin VM, Mr. Raghavendra M
4.	ASAP: Advanced Safe Stewardship of Antibiotics in Primary Care - Pilot study	University of Southampton, UK	Dr. Prakash BN, Dr. Unnikrishnan PM Ms. Anugraha George
5.	Tolerability, treatment adherence, and safety of *Drakshavaleha* in the management of Iron Deficiency Anemia: An open label single arm clinical study	CCRAS, New Delhi	Dr. Prakash BN, Dr. Prasan Shankar, Dr. Aswini Mohan, Dr. Bhanupriya, Dr. Nithin GN

Program title: Voluntary Certification Scheme for Traditional Community Healthcare Providers (VCSTCHP)

Relevance:

VCSTCHP is a National Personnel Certification Scheme, jointly launched by Quality Council of India (QCI), New Delhi and Foundation for Revitalisation of Local Health Traditions (FRLHT), Bengaluru. TDU is a Personnel Certification Body (PrCB), to assess and certify community based, traditional healers through a process of evaluation of their prior knowledge and skills in specific streams (health conditions), based on the Minimum Standards of Competence (MSC) as per ISO 17024.

Highlights:

The assessment of traditional healers under the VCSTCHP scheme was conducted across seven states in India, covering various traditional healing practices. The evaluation process encompassed knowledge assessment, case presentations, viva voce, practical demonstrations, and field verification. A total of 538 traditional healers from 7 states (Table 1) were certified in 2024 based on the minimum competency standard model (Fig 1-6).

State	Recommended for Certification
Jharkhand	193
Odisha	172
Chhattisgarh	120
Andhra Pradesh	16
Kerala	13
Telangana	12
Gujarat	12
Total	**538**

Table 1: Numbers for TCHP certified during 2024

Internal audit was conducted on 24th June 2024 by Dr. Subrahmanya Kumar K and Dr. Noorunnisa Begum in the presence of TDU PrCB team members. Office assessment was conducted by Quality Council of India, New Delhi with a team of Lead Assessor and a Technical Expert on 04th July 2024.

Fig. 1.1: Field verification of traditional healers from Andhra Pradesh by empaneled evaluators and representatives from PrCB-TDU

Fig. 1.2: Field verification of traditional healers from Jharkhand by empaneled evaluators and representatives from PrCB-TDU

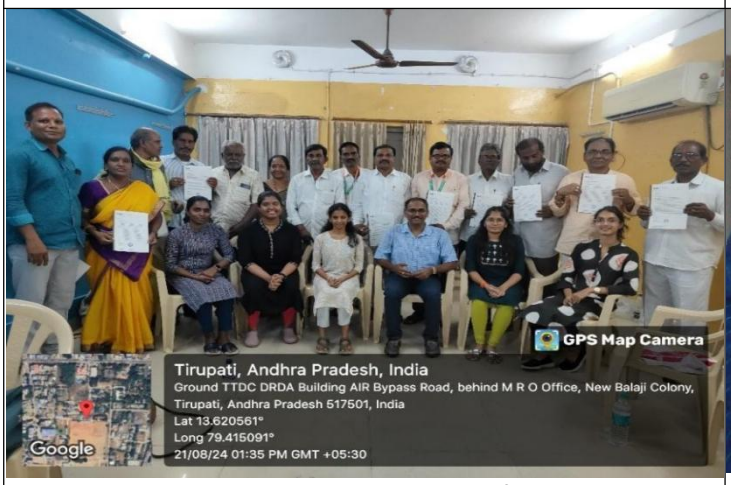


Fig. 1.3: Trained and empaneled evaluators from Andhra Pradesh and Telangana

Fig. 1.4: Oral evaluation of traditional healers from Gujarat by empaneled evaluators and representatives from PrCB-TDU

Fig. 1.5: Practical demonstration of traditional healers from Chhattisgarh

Fig. 1.6: Practical demonstration by traditional healers at Odisha

Evaluation of Add-on value of Iron-Rich Snack with Iron Folic Acid in the Management of Iron-Deficiency Anaemia: A Cluster-Randomized Controlled Trial

Relevance:

This study is to addresses the persistent challenge of Iron Deficiency Anemia (IDA) among reproductive-age women in India, particularly in regions like Raichur-Karnataka, where anemia prevalence is alarmingly high. The objective of the study is to evaluate add-on benefit of iron-rich traditional snack - Methi ribbon, along with iron-folic acid in improving hemoglobin. This approach not only aligns with public health initiatives like the Anemia Mukt Bharat scheme but also seeks to improve compliance with anemia management through culturally acceptable dietary interventions. The findings could provide valuable evidence to support integrated nutritional strategies that could be scaled up to reduce the anemia burden in similar populations.

Highlights:

This cluster-randomized controlled trial focuses on improvements in hemoglobin levels, red cell indices, and iron profiles, also assessing the snack's acceptability and adherence rates. The methodology includes bi-weekly health education, safety monitoring, and compliance checks. During 2024, 284 participants were recruited and intervention is being provided. Study is expected to complete by April 2025.

Fig 2.1: Field visit for Methi ribbon feedback by members Sirwar

Fig 2.2: Review meeting with MRHRU team MRHRU and TDU team

Fig 2.3: Health education was providied to the participatns

Fig 2.4: Baseline blood withdrawal was done for the recruited participants

Anemia: Community Awareness Program: Empowering Rural Communities to Manage Anemia through Integrated Knowledge, Local Resources and Practices

Relevance:

Iron Deficiency Anemia (IDA) continues to be a significant global health challenge, disproportionately affecting vulnerable populations, particularly women and children. Addressing this issue requires context-specific solutions that consider local dietary habits, socio-economic conditions, and healthcare access. Recognizing this need, our program focused on understanding and mitigating IDA in the Nilgiris and Wayanad regions—areas where nutritional anemia remains a major public health concern.

Diet diversification, food fortification and supplementation are three specific recommendations by World Health Organisation for Indian population to fight against Anaemia. Nutrition education to the local communities is chosen as a key strategy to enhance the awareness on anaemia.

Highlights:

- **Capacity Building for Frontline Health Workers:** Conducted 12 training sessions, equipping 275 healers/health workers with the help of GoHT, Keystone Foundation and ICDS Wayanad
- **Community Outreach:** Reached 3510 households directly, benefiting a total of 13,148 individuals through awareness and intervention programs with the help of 29 Master trainers.
- **Health Screening:** Conducted 46 hemoglobin (Hb) tests using a Hemoglobinometer 301 to assess anemia prevalence.
- **School-Based Awareness Programs:** Organized 13 school-level training sessions in the Nilgiris to educate students on anemia prevention and nutrition.
- **Digital Awareness Initiative:** Established five WhatsApp groups (Tamil, Malayalam, and English) to share daily anemia-related messages, ensuring continued engagement and knowledge dissemination.
- **Documentation of Indigenous Food Practices:** Studied and documented traditional food practices of Kotagiri Taluk, providing insights into local dietary habits that can aid in anemia prevention.

The RIST-US team visited the field site to gain a grassroots-level understanding of the program.

Fig 3.1: Level 1 training program

Fig 3.2: Level 2 training program

Fig 3.3: Level 3 training program

Fig 3.4: Community training by the Master trainers

Fig 3.5: Community training by the Master trainers

Fig 3.6: Taking dipstick 1 during the training program

Fig 3.7: Baseline data collection by the Master trainers

Fig 3.8: Documentation of traditional food recipes for anemia

Fig 3.9: RIST US team visit to Nilgiris

Fig 3.10: School level training program

Program Title: Advanced Safe Stewardship of Antibiotics in Primary Care

Relevance:

Antimicrobial resistance (AMR) is projected to cause up to 10 million deaths annually by 2050 if not addressed. Inappropriate antibiotic use, especially in LMICs, is a key driver. Most common infections (e.g., cough, sore throat, and diarrhea) are viral or self-limiting, yet antibiotics are often used unnecessarily. This program promotes antibiotic stewardship and explores traditional medicines as potential alternatives to reduce misuse in primary care. Community engagement activities and a systematic review of existing literature were conducted to assess the current understanding of antimicrobial resistance.

Progress and Activities:

- **Community Engagements:** Four community meetings were conducted across rural, urban, peri-urban, and health professional groups in Karnataka. Discussions focused on antibiotic use, health-seeking behavior, traditional healing practices, and AMR awareness. A comprehensive report compiling the findings from the engagement activities was prepared and submitted to the funding partner.
- **Discussion Topics Included:** Common illnesses, antibiotic use and delays, knowledge of AMR, and use of herbal/traditional remedies as alternatives.
- **Systematic Review:** A systematic review titled "Safety and efficacy of *Piper longum* (Long Pepper) in patients with acute respiratory infection" was completed and submitted to a peer-reviewed journal. The review assesses its potential as a safe and effective alternative to antibiotics for acute respiratory infections.

Highlights:

- 55 participants engaged across 4 community settings and explored community knowledge and practices around antibiotic use and traditional medicine.
- Systematic review completed and submitted for publication to support evidence-based integration of herbal remedies in AMR strategies.

Tolerability, treatment adherence, and safety of Drakshavaleha in the management of Iron Deficiency Anemia: An open label single arm clinical study

Relevance:

This clinical study addresses the urgent need for effective, well-tolerated, and safe treatment options for Iron Deficiency Anemia (IDA), a prevalent global health concern. By evaluating *Drakshavaleha*, the study aims to generate scientific evidence supporting its potential as a viable alternative to conventional iron supplements, which are often associated with side effects that reduce treatment adherence. The findings may not only promote improved adherence but also encourage the integration of Ayurvedic formulations into contemporary medical practice. This is especially relevant for populations where standard treatments may be poorly tolerated or less effective. Accordingly, a multi-centric clinical study has been designed to assess the tolerability, adherence, and safety profile of *Drakshavaleha*.

Highlights:

The study has been planned to include 120 participants, selected based on specific inclusion and exclusion criteria. Prior to the trial, all participants will undergo various blood investigations to check for eligibility. The study will involve multiple assessments over 90 days, including laboratory investigations such as complete blood count (CBC), iron profile, and liver and kidney function tests. Adverse events, treatment adherence, and changes in hemoglobin levels and fatigue severity will be monitored throughout the study. Required Scientific advisory committee and Institutional ethics committee approval has been sought. Currently the study is ongoing and six participants have been recruited.

Fig. 5.1: Camp 1 - Sreeramnahalli

Fig. 5.2: Camp 1 - Sreeramnahalli

Fig. 5.3: Camp 2 - Chokkanhalli

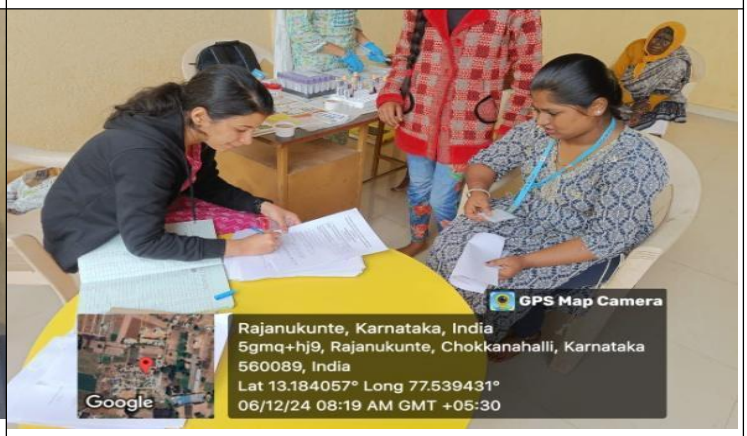


Fig. 5.4: Camp 2 – Chokkanahalli

Fig. 5.5: Camp 3 – I-AIM Healthcare

Functional Genomics and Bio-informatics

Sl. No	Title of research/outreach/ projects implemented during 2024-25	Source of funding	Team members associated with each project
1	**Multi-Centric study to explore the correlation between HLA and Prakriti types in patients of Bone Marrow transplantation**	Kiran Mazumdar Shaw	Dr. Pavithra N, Dr. Poornima Devkumar, Dr. Prasan Shankar, Prof. Malali Gowda, Dr Renuka A , Dr Sharat Damodar, Dr. Cecil Ross, Dr. Tiji A and Dr.Seetharam Anandram, Dr. Nataraj, Dr. Amritanshu Ram
2	**An exploratory study to evaluate the gut microbiome of healthy adults and elderly**	Iom Bioworks Private Limited, Bengaluru, Karnataka 560064	Dr Pavithra, Dr Poornima Devkumar, Dr Gurmeet Singh, Dr. Sivaranjini, Ms. Varalaxmi, Ms. Rajeswari, Dr. Ajay Sethi , Sarvesh, , Dr Ayako Yachie,
3	**Fermented Food Microbiome**	RIST-2	Dr. Pavithra N, Dr Gurmeet Singh, Ms. Rajeswari, Ms. Manisha.
4	**Food Forest Soil Microbiome**	RIST-2	Dr. Pavithra N, Dr Gurmeet Singh, Ms. Rajeswari

Multi-Centric study to explore the correlation between HLA and Prakriti types in patients of Bone Marrow transplantation

Relevance:

Bone marrow transplantation (BMT) relies heavily on HLA (Human Leukocyte Antigen) compatibility between donor and recipient to ensure transplant success and minimize immune rejections and complications like graft-versus-host disease (GVHD) (Morris et al., 2020). Prakriti, an Ayurvedic concept, describes an individual's unique constitution based on three doshas: Vata, Pitta, and Kapha, which are thought to influence disease susceptibility and treatment responses (Sharma et al., 2021). This project hypothesizes that identifying any significant correlation between HLA matching and Prakriti match of the donor and recipient can potentially improve the future of donor selection, pre-transplant evaluations, and post-transplant care in BMTs. This could also lead to better management of GVHD and tailored treatment strategies. (Lopera et al., 2022).

Highlights:

- **Participant Recruitment:** A total of 46 subjects (23 donor-recipient pairs) were recruited from HCG, Mazumdar Shaw Medical Centre, and St. John's Hospital.
- Prakriti & HLA Profiling: Prakriti analysis was completed for 17 donor-recipient pairs through in-person and electronic methods. Corresponding HLA data was successfully obtained from transplant coordinators at all study centers.

- **HLA Match Insights:** Among the 17 pairs analyzed:
    - 47% (8 pairs) had a complete HLA match
    - 52.9% (9 pairs) had a half HLA match

- **Blood Group Distribution:**
    - 35.2% of patients had B+ blood group
    - Followed by 23.5% O+ and A+ groups

- **Diagnosis Distribution:**
    - 52.9% of patients were diagnosed with Acute Myeloid Leukemia (AML)
    - 11.7% with Aplastic Anemia

An exploratory study to evaluate the gut microbiome of healthy adults and elderly

Relevance:

The gut microbiome plays a critical role in health and disease, and research on its composition is rapidly advancing. However, limited studies have focused on the gut microbiome in the Indian elderly population, especially concerning healthy aging. This study aims to fill that gap by analyzing the gut microbial diversity of healthy elderly individuals in India. The goal is to identify biomarkers and microbial patterns associated with good health, which can serve as potential indicators for improving elderly care and health outcomes.

Highlights:

- Successfully completed the clinical study and microbiome sequencing data analysis.
- Identified 1,590 species, 697 genera, 18 phyla, 151 families, 71 orders, and 25 classes in the bacterial taxonomy.
- Planning a shift toward functional analysis to explore metabolic and functional pathways of the identified microbiota.
- Conducted an extensive literature survey covering national and international gut microbiome studies. Our findings align with global trends, reinforcing the robustness of our results.
- Dominant phyla across all populations included:
  Firmicutes, Bacteroidetes, Proteobacteria, Verrucomicrobia, Fusobacteria, and Desulfobacterota—key groups supporting gut and systemic health.
- *Bifidobacterium adolescentis* was notably higher in adults compared to the elderly.
- *Prevotella copri*, *Bifidobacterium longum*, and *Ligilactobacillus ruminis* showed no significant difference between the two groups.

Fermented Food Microbiome Studies

Relevance:

The study of fermented foods holds immense potential across multiple disciplines, including food science, nutrition, medicine, and environmental science. By leveraging Next-Generation Sequencing (NGS) technology, researchers can analyze the microbial composition of fermented foods at a granular level, offering detailed insights into the diversity of microbial communities. This enables a deeper understanding of how fermented foods contribute to human health, particularly through the identification of microbial strains and metabolites that may offer therapeutic benefits. Moreover, studying how fermented foods influence the gut microbiome can aid in the development of dietary interventions to improve health outcomes by modulating the gut microbiome.

Highlights:

- Sample Collection: Idly batter (rice, urad, moong) and fresh milk samples were collected and processed under controlled lab conditions; curd prepared using both commercial and natural starters.
- Physical Analysis: Measured pH, moisture, texture, rheology, and fat content in batter, milk, and curd to correlate with microbial profiles.
- Metagenomics: High-quality DNA extracted, sequenced via Nanopore, and analyzed using standardized pipelines for microbial profiling.
- Data Integration: Ongoing correlation of microbiome data with physical parameters to decode links between microbial diversity, texture, and nutrient dynamics.
- Literature Review - Milk & Curd: Confirmed Firmicutes dominance; Streptococcus in curd and Lactococcus in milk—aligned with global studies.
- Literature Review - Idly Batter: Microbial shifts observed—Proteobacteria at 0h, Firmicutes, Leuconostocaceae, and Weissella dominant by 6h, consistent across ingredient types.
- Ingredient Impact Study: Identified distinct microbial patterns across individual and combined ingredients, offering insights to enhance idly fermentation.

Food Forest Soil Microbiome Studies

This project is highly relevant for several reasons:

- Enhancing Soil Health: By characterizing microbial diversity and functions, we can better understand nutrient cycling, organic matter decomposition, and disease suppression in food forest soils.
- Supporting Sustainable Agriculture: Insights from this study can inform best practices for managing soil biology in agroecological systems, promoting resilience and productivity without synthetic inputs.
- Scientific Advancement: The study contributes to the growing field of soil metagenomics, offering baseline data and novel microbial insights unique to biodiverse food forest ecosystems.
- Climate Action: Healthy microbial communities play a key role in carbon sequestration and greenhouse gas mitigation, aligning the project with broader environmental and climate goals.

Highlights:

- **Sample Collection:** Soil samples collected from two distinct locations within the Food Forest (Chikkaballapur and TDU) under sterile conditions; stored at -20°C for downstream microbiome analysis.

- **Metagenome studies**: DNA Extraction & Quality Control: High-quality DNA successfully extracted; NanoDrop and Qubit assessments confirmed purity and concentration for sequencing. DNA libraries prepared and sequenced using Nanopore technology, enabling generation of high-resolution microbial profiles. Sequencing data processed using standardized pipelines; some samples flagged for re-sequencing due to quality issues.
- **Data Interpretation & Correlation:** Ongoing efforts aim to correlate microbial diversity with environmental and ecological parameters to uncover microbiome-soil-function relationships.
- **Literature Insights:** Review of 10 key studies revealed Proteobacteria as the dominant phylum in diverse soil types—initial trends from our data reflect this pattern.
- **Methodological Benchmarking:** A new Nanopore-based sequencing pipeline has been standardized and benchmarked, strengthening the analytical rigor of future soil microbiome studies.

Table of all RESEARCH/OUTREACH Projects/programs executed BY GROUP in 2024:

Sl. No	Title of research/outreach/ projects implemented during 2024-25	Source of funding	Team members associated with each project
1.	Field trial of the herbal product for external parasites in cows	Group balance fund	M N B Nair Aishini
2	Immuno-booster ball	NDDB	M N B Nair, College of Veterinary Science & A.H. Kamdhenu University, Anand-388001
3.	Case study of the Nature positive agriculture (EVP in animal health management)	WU	Lerica, Tania. (WU), dr. Harikumar and team (NDDB) M N B Nair (TDU)

Team members

Team conducted the case study

Ectoparasites spray

M N B Nair

Aishini

Report of the field study on the Safe and Eco-friendly Herbal spray for Ectoparasite & Flies

Relevance: High prevalence of ectoparasite infestations found in goats, sheep, buffaloes, cattle, camels, horses and dogs. Ectoparasites play a vital role in the spread of specific pathogens of many bacterial, viral, rickettsial, and protozoal diseases in the infested animals, some of which are zoonotic. Indirect effects of ectoparasites consist of transmission of pathogens that cause babesiosis, theileriosis and anaplasmosis. Many of the ectoparasiticides used to control ectoparasite infestations now has become less efficacious due to the resistance developed by the parasites and there are unacceptable amount of ectoparasiticides residues in the food products intended for human consumption from the animal origin. This cost effective herbal spray for ectoparasites is a good alternative for the chemical ectoparasiticide

Highlights:

- This field study on the efficacy of the herbal ectoparasites spray was conducted in the farm of Mr Muralisha, Machonayakanahalli **village, Nelamangala.**
- The farmer has HF, Jersey hybrids 2 Hallikar (Local breed) and 2 Gir cows (local breed).
- Four cows (HF, and Jersey Hybrids) had very high infection all over the body (Figures. 1- 4), 2 had moderate infection and the 4 local breeds had low infection.
- We repeated the treatment on every third day.
- There was significant reduction in small ticks and the larger one were thin and flat indicating that they were not sucking the blood.
- On the 6^{th} day the ticks on the body has reduced considerably.
- However the hot spot (below the tail, inside ear, between the legs, Udder) they were present in large numbers.
- The ticks on the local breeds were eliminated on the 6^{th} day.
- On the 28^{th} day the infection of ticks were controlled (Figures 5-8).
- We monitored cows for 40 days and they look normal with a very few ticks on the hot spot.
- This study indicates to control the ticks the farmer need to use the herbal spray in an interval of 15 -20 days to keep the population of ticks under control in cows

Figure 1

Figure 2

Figure 3

Figure 5

Figure 6

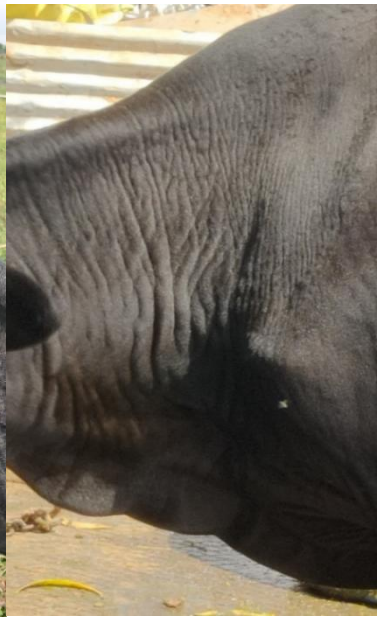


Figure 7

Figures: 1 – 5: Cows infected with ectoparasites, Figures 6 and 7: After treatment with the ectoparasites spray. (Copyright of photo: M N B Nair)

Validating efficacy of the EVM formulation for immunity enhancement

Relevance:

- This natural, ethno-veterinary formula enhances the overall well-being and performance of dairy cattle.

Key Benefits:

- Enhanced Immunity: The EVM supplementation enhances the cell defence system and boosts natural disease resistance. It promotes optimal health and productivity in dairy cattle
- Proprietary Formula: IMMUNO BOOSTER BALL features a unique blend of natural herbs and salt

Highlights:

The salient observations are as follows:

1. **Haematological parameters**:
   - The number of RBCs increased significantly (<0.05) in the supplemented group as compared to the non-supplemented (Control) group indicating supplementation of the EVM mixture stimulates erythrocyte production.
   - The data revealed a significantly (<0.05) higher level of haemoglobin and haematocrit (HCT) in the supplemented group which is due to increased RBCs in the supplemented group as compared to the non-supplemented group
   - A significantly (< 0.05) higher number of platelets in the supplemented group was observed as compared to the control group
   - Total leukocyte counts (TLC), Lymphocyte percentage and granulocyte percentage were increased significantly (< 0.05) in the supplemented group as compared to the control indicating a better immune system.

2. **Cellular immunity parameters**:
   - The neutrophilic phagocytic index (NPI) indicated that the phagocytic activity of neutrophils was improved in the EVM-supplemented group as compared to the non - supplemented group.
3. **Biochemical parameters**:
   - A significant (< 0.05) increase in the level of total protein and albumin
   - Levels of Calcium, Blood Urea Nitrogen (BUN) and total immunoglobulin were increased significantly (< 0.05) in supplemented animals as compared to non-supplemented animals
   - Levels of Calcium, Blood Urea Nitrogen (BUN) and total immunoglobulin were increased significantly (< 0.05) in supplemented animals as compared to non-supplemented animals.

- The concentration of ALT and AST increased significantly (< 0.05) in EVM-supplemented animals as compared to non-supplemented animals
- Alkaline phosphate was decreased significantly in the supplemented group
- A non-significant reduction in the level of BHBA and NEFA was also found in the supplemented group

4. **Hormonal parameters**:

- The levels of T3 and IGF-I increased significantly (< 0.05) whereas a non-significant increase in the level of T4 was observed in the supplemented group
- Higher levels of T3, T4 and IGF-I indicate an improvement in the metabolism and growth of animals with EVM supplementation

5. **Antioxidant parameters:**

- The level of Superoxide dismutase (SOD) increased significantly (< 0.05) and Thiobarbituric Acid Reactive Substance (TBARS) decreased significantly (< 0.05) in the supplemented group
- Vitamin E increased significantly (< 0.05) whereas, a non-significant increase in the level of Vitamin A was found in supplemented animals

6. **Administration Schedule**

- Administer one booster ball per cattle / buffalo every 15 days for 3 months
- Total dosage: 6 balls per animal for the entire 3-month treatment period

Case study: "Small-holder dairy farming in Anand, Gujarat state, India, and the practice of Ethno-veterinary Medicine"

Relevance:

This case study was conducted in Anand, Gujarat, involving Wageningen University (Dr. Larica and Tania), NDDB (Dr. Harikumar and the team) and TDU (Dr. M N B Nair and Dr. Punniamurthy) explored how dairy farming stakeholders perceive and engage with ethno-veterinary medicine (EVM) within the context of nature positive food systems (NPFS).

EVM practices, based on a deep understanding of local ecosystems and animal behaviors, make them particularly relevant for their potential benefits in sustainable and accessible veterinary care, especially in rural and resource-limited settings. Our primary goal was to delve into the diverse perspectives of these stakeholders on EVM, examining not only its current application but also identifying the necessary support and improvements required to enhance nature positive food systems into agricultural systems

Note: The case study report is not yet release to public by WU

Conservation of Natural Resources

Sl. No	Title of research/outreach/ projects implemented during 2024-25	Source of funding	Team members associated with each project
1.	Green trails (Nature Based Education)	IRD, Paris	Dr. Abdul Kareem, Ms. Amrita G, Mr. Arun Kumar Mr. Romain Simenel Ms. Sudeshna, Mr. Chidananda murthy, Mr. Naveen and Mr. Satish from Yuva sanchalana trust, Doddaballapur
2.	Enhancing the livelihood security for LRP and health security for animals through skill Development on Ethno-Veterinary Practices	Singtel India PVT Ltd. New Delhi	Dr. M. Abdul Kareem Ms. Amrita G. Dr. S. K. Kumar
3.	Conservation of indigenous species and regeneration of community lands through local community institutions	TERI- SGP, New Delhi	Dr. M. Abdul Kareem Dr. Mohan Varghese Mrs. Amrita G Dr. Subhasish Das Gupta Ms. Joanica D. Jyrwa
4.	Formation and Training of Biodiversity Management committee, Pondicherry	Pondicherry Biodiversity Council	Dr. Kareem Ms. Amrita, Mr. Sagai, Mr. Arvind
5.	Preparation of People's Biodiversity Register of 25 Villages of Baloda Bazzar , Chhattisgarh	State Biodiversity Board, Chattisgarh	Dr. Kareem, Dr. Ravi T., Ms. Amrita G.
6.	Revitalisation of MPCA & Camp; MPDA Program: Review of the Progress and Conservation Status of MPCAs, and Guidelines for strengthening the Program (Funded by National Medicinal Plants Board, New Delhi)	NMPB, Delhi	Dr. Abdul Kareem, Mr. Somashekhar B S Dr. Noorunnisa Begum, Dr. Tabassum Ishrath Fathima Dr. K. Ravikumar, Dr.Dhatchanamoorthy N. Mr. Arun Kumar Mr. Ashutosh Sharma

Green trails

Relevance:
The University of Trans-Disciplinary Health Sciences & Technology (TDU), Bengaluru with IRD, PALOC, France and Yuva Sanchalana Charitable Trust, Doddaballapur initiated a nature appreciation program at Makali durga, Doddaballapur District for the students of Aroodi Higher Secondary School, Doddaballapur. This program helps children to understand and appreciate nearby natural resources and learn how to conserve those resources for future generations through activities with scope for hands on experience, observation, experiments and outdoor learning, to enable the develop necessary interest in environment.

Highlights:
Totally 100 students and 10 teachers participated in this program for 2 days with 6 mentors at Makalidurga reserve forest. The visit to Maklidurga aligns with National Education Policy (NEP) 2020 by promoting experiential learning, environmental consciousness, and holistic development. It fosters critical thinking, problem-solving, and ecological awareness—key aspects of NEP's (section 4.6, 4.29 and 4.4) emphasis on sustainable education and skills for the future.

Activates conducted by the students: Garland Making, Toy Crafting, Exploring Music with Plants Dye Plants, Learn Medicinal uses of Plants etc.

Enhancing the livelihood security for LRP and health security for animals through skill Development on Ethno-Veterinary Practices

Relevance:
Livestock plays a crucial role in the Indian economy, providing livelihood security to millions of people across the country. With approximately 20.5 million people relying on livestock for their livelihoods, the sector holds immense potential for income generation and economic stability. In rural communities, where around two-thirds of the population depends on livestock, it contributes significantly to household income, accounting for 16% of small farm households' earnings. Moreover, it employs about 8.8% of India's population and contributes 5.1% to the GDP as of 2019-20.

However, the rural livestock sector faces a multitude of challenges. These include a lack of veterinary health care, improper use of veterinary drugs leading to residues in animal products, and a lack of awareness about the use of medicinal plants and the quality of animal products. These issues are compounded by seasonal stress affecting animal health, inadequate resources, and a lack of skilled animal health (AH) personnel in the community. Furthermore, there is low adoption of traditional practices for livestock health and management, exacerbating the economic and social instability of rural farmers.

This project is proposed as a follow-up of our previous project interventions as part of "Health & livelihood security program from natural resources for 25 local resource persons (LRPs)", implemented with LRPs in 5 taluks of Bengaluru Rural district of Karnataka.

Highlights:

- To ensure optimal animal health and public well-being, this project aimed to empower 25 Village-Based Local Resource Persons (LRPs), identified across five taluks: Hoskote, Devanahalli, Doddaballapur, Nelamangala, and Rajanukunte. Endowed with effective communication skills and an intimate understanding of local dynamics, these LRPs played a pivotal role in assisting farmers with nutrition, ration balancing, and primary healthcare for dairy animals. Despite disruptions caused by the COVID-19 pandemic, the crisis has catalyzed an opportunity for rekindling entrepreneurship among LRPs, harnessing their expertise for community-driven endeavors. Training LRPs for community entrepreneurship not only revitalized the local economy but also ensured the welfare of livestock. By promoting sustainable cultivation of medicinal plants and marketing of ethno veterinary products, LRPs emerged as catalysts of change, concurrently addressing both health and livelihood security concerns.

- Capacity-building initiatives orchestrated by TDU empowered LRPs with indispensable knowledge and skills in medicine preparation, product development, and small-scale business management. These initiatives not only ameliorated animal health outcomes but also fortified the economic fabric of rural communities. Out of the identified LRPs, ten were selected based on criteria like influence, impact, willingness to continue, leadership skills, and ability to scale, to serve as community entrepreneurs. These entrepreneurs represented the embodiment of transformative potential, epitomizing the amalgamation of traditional wisdom with contemporary practices in steering sustainable development.

In summary, through collaborative endeavors, innovative interventions, and community empowerment, this project was able to chart a sustainable future where rural communities flourish with dignity and prosperity, facilitated by the unwavering support of stakeholders like SINGTEL Global India Private Limited and BAMUL. Activities such as the distribution of plant saplings, monitoring workshops, entrepreneur selection, and capacity-building endeavors underscored the multifaceted approach employed to realize this vision.

Conservation of indigenous species and regeneration of community lands through local community institutions

Relevance:

Umsning is a biodiversity rich ecotone zone with diverse multi-species. Though falling within the realm of mega biodiversity hot spot in the country, skewed development, economic backwardness, mindless exploitation of natural resources and population increase over the decades have put enormous burden on the biodiversity and ecosystem services adversely affecting the life, environment and livelihood of the NTFP dependent Khasi community people inhabiting Umsning area, as well as aggravating the climate change. Forest and land degradation has led to habitat loss and reduced livelihood, and the increased dependence on forest NTFPs has affected forest diversity & cover (ISFR, 2023). Being a sixth schedule state with traditional governance institutions (eg: Dorbar Shnong), majority of the lands are with the community. The study area has witnessed falling agricultural production, water scarcity, dwindling ecosystem services and pollution apart from shrinking livelihood generation potential and employment. Loss of Indigenous plant species is a challenge requiring urgent attention and conservation.

With this background, the proposed project aims to effectively address the above problems with the active participation of the local community in biodiversity conservation through afforestation and ex-situ conservation of indigenous tree species and agricultural crops, awareness and capacity building of the rural community especially the Biodiversity Management Committee (BMC) members. The traditional ecological knowledge of the village community in protecting biodiversity, sustaining agricultural production can augment biodiversity conservation, arrest land degradation and minimize the impact of climate change which are in conformity with the SGP objectives.

Highlights:

The project will be executed at Umsning district of Meghalaya for two years (2024-2026) Based on published literature, survey and questionnaire, the species that have to be conserved will be identified. The species requiring urgent protection and conservation will be selected and multiplied ex-situ. The natural habitat where these species need conservation will be identified and compiled. A plan will be drawn up to execute the conservation programme through the women led team of JFMCs. Training will be provided on sustainable exploitation of NTFP and other endangered species. The farmer management groups will be given the task of establishing the native tree species multiplied in the nursery and establish to improve the forest cover and the livelihood of the community. A survey will be done at the end of the project period to ensure that the local community acquire the skills and own the assets created for sustaining the work with additional funds at the end of the project.

Formation and Training of Biodiversity Management committee, Pondicherry

Relevance:

Formation of Biodiversity Management committees at 4 Taluks, 10 panchayats and 5 Municipalities at Pondicherry. The Biological Diversity Act, 2002 (No. 18 of 2003) was notified by the Government of India on 5thFebruary, 2003. The Act extends to the whole of India and reaffirms the sovereign rights of the state over its biological resources. Subsequently the government of India published Biological diversity Rules, 2004 (15th April, 2004). The Rules under section 22 states that 'every local body shall constitute a Biodiversity Management Committee (BMC's) within its area of jurisdiction'.

Highlights:

Activity: 1: Conduct of meetings (Several rounds of discussion to select the committee)
The official letter from the member secretary was send to the 5 Municipal Commissioners and three Block Development officers (BDOs) briefing the process of formation of BMC and introducing FRLHT team to the stake holders.

Activity-2: Formation of Biodiversity Management Committee
In each Municipality, Gram panchayat and Taluk more than 40 to 60 members were presented. The details of biodiversity present in their respective areas and its importance were explained by the experts. Later the Regional Administrator and the Commissioner invited interested people who had willingness to be the members of the BMC as per the guidelines were invited. The seven member's committee were formed. Among them 7 members were selected and among them by election was conducted to elect the Chairman of the committee by a proper voting system. The resolution was signed by all members, the minutes were recorded with the signed attendance

Activity-3: One training to BMCs and panchayat members on Biodiversity act and roles and responsibility of BMCs
Training in the regional language (Tamil, Malayalam and Telugu) was conducted by inviting the experts from the nearby colleges, research institutes and NGOs. The topics dealt were a) Biodiversity and its importance b) Biological Diversity Act 2002 & Roles and Responsibilities of BMC c) Biodiversity and its impact on environment d) People's Biodiversity Register and its importance e) Conservation and its importance f) The resources used in ayurveda and its importance for conservation f) Region specific plants and animals in relation to culture and uses g) Need for conservation of medicinal plants h) Agro-biodiversity. Was conducted. Around 19 BMCs (133 members) of Municipal, Taluk and Panchayat, 323 Gram Sabhas members from 10 village panchayat and 433 SHG groups, NGOs, Welfare Organizations, Environment Groups, Farmers, Civil Society organizations, teachers, local healers, women groups and general public were trained on the above-mentioned topics.

Activity-4: Facilitate in opening the bank account

Bank account was opened at 5 Municipalities, 4 Taluk and 10 Gram Panchyat to carryout BMC level activities.

Project 5: Preparation of People's Biodiversity Register of 25 Villages of Baloda Bazzar , Chhattisgarh

Relevance:

The People's Biodiversity Register (PBR) is a mandatory document to be prepared in all levels panchayaths in India according to the Biodiversity Act 2002. This is one of the most crucial steps to preserve Traditional Knowledge of communities, recognizing Local Healers and giving them a platform, power and responsibility to manage the local Biodiversity present in the area.

The document can also use for livelihood creation based on the guidelines of NBA, used to declare Biodiversity Heritage Sites –which can be very beneficial to the region.

Highlights:

- The BMC members and community members were familiarized with provisions of the Biological Diversity Act, the concept of People's Biodiversity Register and possible advantages of engaging in the PBR process. Sensitization of the public about the study, survey and possible management was done.
- Training of members in identification and collection of data on biological resources and traditional knowledge was completed based on guidelines of National Biodiversity and using local resources
- Preparation of People's Biodiversity Register (PBR) for 25 Gram Panchayats of Baloda Bazzar was completed submitted to technical support group
- Computerization of information and creation of a consolidated database in the form of People's Biodiversity Register in the formats specified by the National Biodiversity Authority has been completed.

Revitalisation of MPCA & MPDA Program: Review of the Progress and Conservation Status of MPCAs, and Guidelines for strengthening the Program (Funded by National Medicinal Plants Board, New Delhi)

Achievements:

Conducted Medicinal plant survey in 6 MPCAs of Gujarat: Mathal, Mangvana, Tharavada, Ler, Gugliyana and Kadoli MPCAs and documented the general floral wealth and collected samples for herbarium. Laid 26 quadrats (31.61m x 31.61m) in 6 MPCAs in Gujarat and trees, shrubs, herbs and lianas were recorded and identified. Tree GBH (greater than 15 cm) and height were measured throughout the plot. Shrubs were recorded in 5m x 5m plots on two diagonal corners and herbs were recorded in 1m x 1m plots on all 4 corners.

Conducted Medicinal plant survey in 2 MPCAs of Chhattisgarh: Sidhavand MPCA and Bhatwa MPCA, Makdi Range and documented the general floral wealth and collected samples for herbarium. Laid 6 quadrats (31.61m x 31.61m) in 2 MPCAs and trees, shrubs, herbs, lianas were recorded and identified. Tree GBH (greater than 15 cm) and height were measured throughout the plot. Shrubs were recorded in 5m x 5m plots on two diagonal corners and herbs were recorded in 1m x 1m plots on all 4 corners. Collected herbarium specimens of 60 species with 180 accessions.

Conducted Medicinal plant survey in three MPCAs of Dindigul: Ulkombai MPCA, Thavasimadai, Viralipattti village, Malaiyur; Kuthuppukal MPCA, Karanthamalai, Natham and Garuda Theertham, Vemparali village, Alagarkoil and documented the general floral wealth and collected samples for herbarium. Laid 10 quadrats (31.61m x 31.61m) in each MPCA and trees, shrubs, herbs, lianas were recorded and identified. Tree GBH (greater than 15 cm) and height were measured throughout the plot. Shrubs were recorded in 5m x 5m plots on two diagonal corners and herbs were recorded in 1m x 1m plots on all 4 corners. Collected herbarium specimens of **150** species with **450** accessions

Conducted Medicinal plant survey in four MPCAs of Sikkim himalaya: Tamzey MPCA, North Sikkim, Lachen MPCA, East Sikkim, Mamring and Sipsu MPCAs from West Sikkim documented the general floral wealth and collected samples for herbarium. Laid 20 quadrats (31.61m x 31.61m) in four MPCAs in Sikkim and trees, shrubs, herbs, lianas, epiphytes and palms were recorded and identified. Tree GBH (greater than 15 cm) and height were measured throughout the plot. Shrubs were recorded in 5m x 5m plots on two diagonal corners and herbs were recorded in 1m x 1m plots on all 4 corners. Collected herbarium specimens of 60 species with 180 accessions.

Conducted Medicinal plant survey in 3 MPCAs of Nagaland: Fakim MPCA, Kiphire; Thanmir MPCA, Kiphire and Kher MPCA, Mokokchung District and documented the general floral wealth and collected samples for herbarium. Laid 15 quadrats (31.61m x 31.61m) in 3 MPCAs in Nagaland and trees, shrubs, herbs, lianas, epiphytes and palms were recorded and identified. Tree GBH (greater than 15 cm) and height were measured throughout the plot. Shrubs were recorded in 5m x 5m plots on two diagonal corners and herbs were recorded in 1m x 1m plots on all 4 corners. Collected herbarium specimens of **180** species with **540** accessions.

Conducted Medicinal plant survey in 5 MPCAs of Kodaikanal Division: Thalavukanal MPCA, Poombarai Range, Jamendar Shola MPCA, Berijam Range, Edamankarai MPCA, Mannavanur Range, Kumbakarai MPCA, Devathanapatty Range and Deramedu MPCA, Perumpallam Range and documented the general floral wealth and collected samples for herbarium. Laid 5 quadrats (31.61m x 31.61m) in 2 of the MPCAs (Jamendar Shola & Deramedu) and trees, shrubs, herbs, lianas were recorded and identified. Tree GBH (greater than 15 cm) and height were measured throughout the plot. Shrubs were recorded in 5m x 5m plots on two diagonal corners and herbs were recorded in 1m x 1m plots on all 4 corners. Collected herbarium specimens of **50** species with **150** accessions.

Conducted Medicinal plant survey in 2 MPCAs of Chhattisgarh: Sidhavand MPCA and Bhatwa MPCA, Makdi Range and documented the general floral wealth and collected samples for herbarium. Laid 6 quadrats (31.61m x 31.61m) in 2 MPCAs and trees, shrubs, herbs, lianas were recorded and identified. Tree GBH (greater than 15 cm) and height were measured throughout the plot. Shrubs were recorded in 5m x 5m plots on two diagonal corners and herbs were recorded in 1m x 1m plots on all 4 corners. Collected herbarium specimens of 60 species with 180 accessions.

Team Members

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Green trails (Nature Based Education)




Enhancing the livelihood security for LRP and health security for animals through skill Development on Ethno- Veterinary Practices


Conservation of indigenous species and regeneration of community lands through local community institutions

Formation and Training of Biodiversity Management committee, Pondicherry

Revitalisation of MPCA & Camp; MPDA Program: Review of the Progress and Conservation Status of MPCAs, and Guidelines for strengthening the Progra (Funded by National Medicinal Plants Board,

Conservation of Natural Resources - Herbarium

Sl. No	Title of research/outreach/ projects implemented during 2024-25	Source of funding	Team members associated with each project
1	Wild Edible Plants of Chhattisgarh	C.G.T., L.H.T. & M.P.B.	Dr. S. Noorunnisa Begum Dr. K. Ravikumar Dr. Dhatchanamoorthy N Mr. Arun Kumar
2	Documentation and Revival of Wild Edible Plants (WEPs) in Karnataka State with special focus on Immunity building wild plant based preparations.	DST	Dr. S. Noorunnisa Begum Dr. K. Ravikumar Dr. Dhatchanamoorthy N Mr. Arun Kumar Mr. Patturaj
3.	Unveiling the enigmatic world of *Impatiens* of Western Himalayas: Exploring diversity, endemism and phylogeny	IAPT	Mr. Ashutosh Sharma

Wild Edible Plants of Chhattisgarh

Relevance:

The state of Chhattisgarh is rich in biodiversity, with its vast forests and tribal populations that have traditionally relied on natural resources for sustenance. Wild Edible plant has a significant role in the daily lives of many rural communities is wild edible plants. These plants grow naturally in the forests, fields, and wastelands of the region and offer a sustainable source of nutrition and have been integral to the food security and cultural heritage of the local population for generations.

Highlights:

The field survey was conducted in the three study areas-Korba, Kanker, and Katghora forest divisions in Chhattisgarh. Totally 135 respondents across 23 villages were systemically interviewed and wild edible plant information was documented systematically. The information on tribe name, plant local name, botanical name, family, habit, wild edible usages and cultural information was recorded systematically.

A total of 297 botanical species were documented across the three study sites. Of these, 162 were unique flowering plants, while 8 species were non-flowering (cryptogams). It was interesting to note that villagers were consuming fungi as part of their food regime and each fungi had distinct local names.

Project 2: Documentation and Revival of Wild Edible Plants (WEPs) in Karnataka State with special focus on Immunity building wild plant based preparations.

Relevance:
Documentation and revival of Wild Edible Plants (WEPs) in Karnataka focuses on preserving traditional knowledge of indigenous plants with high nutritional and medicinal value. Special emphasis is placed on immunity-boosting preparations derived from these plants, helping enhance community health while promoting sustainable use and conservation of local biodiversity.

Highlights:
The project study area is five districts of Karnataka namely Mysore, Coorg, Uttar Kannada, Raichur and Chikballapur. During this year literature work on wild edible plants of Karnataka was completed. Field work in the HD Kote, Nanjadgud and Sargur in Mysore district, Karnataka was completed. Totally 52 species were used as wild edible plants by the communities of the Mysore study area.

The rich diversity of wild edible plants that are vital to local diets and traditions. Some notable examples include **Chakurike (*Cissus quadrangularis*)**, known for its medicinal properties, and **Moringa (Moringa oleifera)**, a highly nutritious plant often used for its leaves. **Tamarind (*Tamarindus indica*)**, with its tangy flavour, is widely used in local cuisine. **Wild spinach (*Basella alba*)** and **Jackfruit (*Artocarpus heterophyllus*)** are common wild edibles found in the region. These plants offer valuable nutrients and medicinal benefits, playing an important role in food security and health for the local communities.

Project 3: Unveiling the enigmatic world of *Impatiens* of Western Himalayas: Exploring diversity, endemism and phylogeny

Relevance:
Resolving old persisting problems with taxonomy, nomenclature and distribution of Western Himalayan *Impatiens* using integrated taxonomic approach. Attempt to relocate and rediscover some narrow endemic species that are only known from 19th century old British collections by exploring in and around their type localities. And establishing herbarium collection of *Impatiens* species from Western Himalayan region at regional FRLH herbarium with duplicates at India's largest herbarium CAL (Central National Herbarium, Botanical Survey of India, Kolkata) for future references.

Highlights:

24 days field expedition to document *Impatiens* species diversity in the Kumaon and Garhwal Himalayas from 6th-29th August 2024 which leads to two major rediscoveries of endemic *Impatiens* species after more than hundred years i.e. *I. reidii* and *I. inayatii* (from its type locality).

Another 14 days long field expedition to document the *Impatiens* species diversity in the Kashmir and Ladakh Himalayas from 7th - 20th September 2024 which lead to collection of five endemic species of *Impatiens* including *I. flemingii, I. balfourii* and *I. bicolor* complex.

Conservation of Natural Resources- Somashekhar B S

Sl. No	Title of the project	Source of funding	Team members associated
1	Facilitating BMCs in Education, Awareness and Skill Development and Preparation of People's Biodiversity Registers (PBRs) in Haryana State	Haryana State Biodiversity Board, Haryana	**PI: Somashekhar B S,** Team: Atul Kumar Gupta

Facilitating BMCs in Education, Awareness and Skill Development and Preparation of People's Biodiversity Registers (PBRs) in Haryana State

Relevance:

As per section 41 (1) of the Biological Diversity Act 2002, every local administrative body is expected to constitute a BMC (Biodiversity Management Committee) within its jurisdiction for the purpose of promoting conservation, sustainable use of bio-resources. Main function of a BMC is to prepare People's Biodiversity Register (PBR), which serves as an authentic document of biodiversity elements (flora, fauna, landscapes) found in a village, and associated traditional knowledge. In this direction, Haryana State Biodiversity Board, has engaged TDU as a Technical Support Group, for this project under implementation in 717 Gram Panchayts of Nuh, Palwal and Rohtak districts in Haryana.

Highlights:

- During the year 2024, the team focused on consolidation and field authentication of PBR drafts in the project districts. It further took up the validation of PBR drafts by the BMC members.
- These updated PBRs were further converted in to print ready versions.
- The TDU project team (PI) took part in the Annual review meeting of all Technical Support Groups (TSGs) involved in PBR documentation, during 31st January – 1st February 2024 held at Kalesar Hathni kund, Yamunanagar, Haryana and shared the project progress with HSBB authorities.
- The project team (PI) attended 2 periodical review meetings with HSBB held on on 13th May 2024 and 11-12th September 2024 and shared the project progress with HSBB authorities.
- The project team (PI) attended a Field review meeting by the esteemed members of National Biodiversity Authority with TSGs and district coordinators involved in PBR documentation in Haryana, on 18th May 2024. during their visit to BMCs and Biodiversity Heritage sites in Haryana.

Name of the Theme: Co-existence Studies

In June 2024, the “Human-Wildlife Coexistence Cell” expanded into a full-fledged theme at TDU, named the “Coexistence Studies Group,” with its continuing focus on research, education, and public engagement towards learning to live well with nature and all other beings around us. The vision of this Group is primarily to rethink ways of coexisting with and conserving all forms of life, not just in isolated and/or protected ecosystems but also those living with and around us. Our goal is to understand human–nonhuman interactions and relationships as a spectrum, rather than as binaries of conflict and coexistence, and to work towards a more just and inclusive approach to conservation.

The Coexistence Fellowship is currently the flagship programme of the Coexistence Studies Group at TDU, which was created with the vision of promoting human–wildlife coexistence and a more holistic, inclusive, and just approach to nature conservation.

Through this programme, we also aim to disrupt conventional power dynamics, particularly between the Global North and Global South, urban and rural, outsider and insider. Our philosophy of building local partnerships and capacity building is embedded in the programme's unique paired structure, where the fellowship is awarded to a team of two and where at least one of them must belong to a local community from the proposed project site. Through a two-year training and mentorship model, the Fellowship provides the Fellows with the skills and support to understand and facilitate culturally relevant co-existence practices in their sites of intervention. Other than the pairing and mentorship, the third unique aspect of the Fellowship Programme is the interdisciplinary coursework, which is carefully curated by a team of academics and practitioners with experience in creating innovative pedagogies. The classes are multilingual, ensuring accessibility and engagement for the diverse group of learners.

Our first cohort which graduated and received their certificates in October 2024 consisted of ten Fellows while and our current second cohort has twelve Fellows. Their projects span a variety of landscapes across India, from the cold deserts of Ladakh to the tropical beaches of Kerala, and a diversity of human–nonhuman interactions, from sarus cranes to mugger crocodiles.

The Coexistence Fellowship is funded by the British Asian Trust and the Elephant Family. A total grant of INR 3,04,41,000 (Indian Rupees Three Crore Four Lakhs and Forty-One Thousand only) was received by TDU for the project from The British Asian Trust for a period of 30 months, from January 2023 to July 2025. The programme is led by Dr Samira Agnihotri as the Principal Investigator and Dr Anindya Sinha as the Co-Investigator. Tansu Sangma, a graduate of the MSc programme in Wildlife Biology from AVC College (Autonomous), Mayiladuthurai, in 2023 joined us as an Administrative Assistant in June 2024. Srividya Vathsal, alumna of TDU's MSc programme in Life Sciences (Ayurveda Biology) 2021-2023, joined us as the Fellowship Coordinator in August 2024.

What has been the impact of the first cohort?

Astha Chaudhary and Dipti Arora's project focused on human–sarus crane relationships in the hinterlands of Uttar Pradesh. Their interviews with local people revealed the deep cultural connections of farmers and villagers with this species, which pave the way for coexisting with this species, and in turn, ensuring their conservation. Their short film, "In the Land of the Sarus," showcases these perspectives. Astha and Dipti also wrote several popular articles about their experiences and intend to publish a children's story book on the sarus crane in the local language. Astha is currently with the National Alliance for Social Security and Dipti is a Fellow with the Public Policy in Action Praxis Residency Programme, working in Prayagraj, Uttar Pradesh.

Raja Hussain and Amir Khan documented the significant role of insects in the traditions and livelihoods of the Tiwa community in Assam, highlighting the culture that would be lost if such communities are displaced. Their short film, "Nature's Kitchen: Exploring the Tiwa Community's Traditional Food Practices," was selected to be screened at the Forests of Life Festival at Azim Premji University in Bangalore, which was attended by hundreds of school and college students.

Avantika Thapa and Chandramaya Sharma studied changing human–nonhuman relationships in the Sikkim and Darjeeling Himalayas. Avantika published a paper – listed below – proposing a conceptual framework for understanding human–wildlife coexistence, and is currently a Postdoctoral Fellow with the 'Action for Mountains and People in the Himalayas' initiative at the Ashoka Trust for Ecology and the Environment (ATREE), Bangalore. She is working on two more manuscripts related to their findings from the Fellowship, on novel behaviours of the mainland serow and the Asiatic black bear, in the context of human–nonhuman animal interactions. She participated in the 18th Congress of the International Society of Ethnobiology (ISE) in Morocco in 2024 and is a student representative in the current ISE Board. Chandramaya's current focus is on her responsibilities as a new parent.

Sunil Harsana and Nitesh Kaushik's project showed how humans and wildlife coexist in the Aravalli hills of northern India. Through camera traps, they found people and animals, including hyenas and leopards, use the same paths but at different times. The same camera traps also showed the presence of several species that had never been documented in these areas before, such as the near-threatened rusty-spotted cat, sambar deer and the critically endangered elongated tortoise. Their interviews with villagers also brought out the diverse worldviews, which have enabled local communities to share space with leopards and hyenas. These will soon be published in the form of journal articles and popular media articles. While doing the Fellowship, Nitesh finished a BEd by correspondence and hopes to incorporate these stories of coexistence into nature education modules for local schools. Sunil, too, is pursuing two master's degrees in Archaeology and Law, which will add strength to his mission to save his beloved Manger Banni from unregulated development.

Priyanka Das and Amir Chhetri's goal was to mitigate human–elephant conflict in the northern Dooars via a two-pronged approach. They first recommend the restoration of degraded patches of forest to improve the quality of forage available for elephants, and second, to reduce further degradation by creating alternatives for the fuelwood needs of the local communities, primarily tea-estate workers. They conducted more stake-holder meetings in two years than many researchers do in five years! These meetings also led to on-ground change – with the Forest Department of West Bengal including their ideas for setting up nurseries of elephant-favored trees and planting them in degraded patches in their official Working Plan. Tea estate managers agreed to set aside plots to grow trees for fuelwood, reducing the need for estate workers to enter the forests where they come into conflict with elephants. Their work also revealed the complex socio-economic drivers of conflict in this region. Priyanka plans to do a PhD to dive deeper into these socioecological issues in this landscape and Amir hopes to continue the work they started together in the days to come.

Rigzen Dorjay and Sherab Lobzang, both from Ladakh, grew up witnessing the changing pressures on local pastoralist communities and their traditional pasture lands. Their project piloted a novel intervention to reduce these pressures and therefore, mitigate negative interactions between the herders and wildlife. They experimented in reviving an age-old tradition of providing locally grown barley from Western Ladakh as winter feed for the livestock of herders in East Ladakh. This reduced kid mortality by close to 50%, which, they hope, will lead to increased tolerance towards Tibetan wolves and snow leopards. They plan to expand this intervention to more villages in collaboration with local line departments, such as the Animal/Sheep Husbandry Department, and explore ways to celebrate and showcase herder culture that has coexisted with the wildlife of this unique landscape for centuries. Their article on the Tibetan mastiff is one of the ways in which they bring the voices of their communities to the mainstream.




Name of the Theme: Ayurveda Neurobiology

Sl. No	Title of research/outreach/ projects implemented during 2024-25	Source of funding	Team members associated with each project
1	Effect of Brahmi Ghrita on Chemotherapy Induced Cognitive Impairment (CICI)	AYUSH-EMR	Dr. Ashwini Godbole, Vd. Swathi BH, Vd. Bhargavi P, Mr. Arman Deep Singh and Prof. Subash Khushu
2 a	Effect of Brahmi Ghrita on Age related Cognitive Impairment Community based clinical study Mode of action, experimental research	Pratiksha Trust	Dr. Ashwini Godbole, Vd. Swathi BH, Vd. Bhargavi P, Mr. Arman Deep Singh, Dr. Mukesh Kumar and Prof. Subash Khushu Dr. Ashwini Godbole, Mr. Anjaneyulu J, Ms. Ashwini Thakare, Mr. Prasanna Simha and Mr. Pushpendra Jat
3	Cognitive wellness with holistic treatment for diabetes.	Pratiksha Trust	Dr. Ashwini Godbole, Vd. Swathi BH, Vd. Bhargavi P, Mr. Arman Deep Singh, Dr. Mukesh Kumar and Prof. Subash Khushu
4	Comparative analysis of nootropic effects of Indigenous Cow and Cross breed Cow Ghee using *Caenorhabditis elegans* models	DST SHRI	Dr. Ashwini Godbole, Dr. Vd. Subrahmanya Kumar K, Dr. C N Vishnuprasad and Prof. Nair MNB

Relevance:
Optimum nervous system function is crucial for a high quality of life, as indicated by robust cognition, memory, and sensory-motor functions.

Current, healthcare solutions primarily offer symptomatic relief with limited impact on disease prevention or correction. Understanding science behind Ayurvedic nootropic foods and nutraceuticals can support cognitive wellness, nervous system health and prevent neurodegenerative disorders, especially in elderly population.

Highlights:

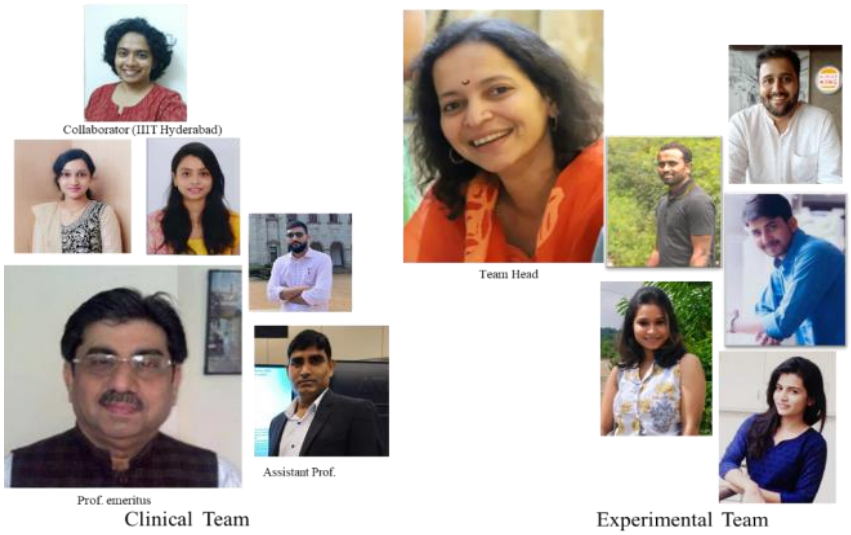
1. **Proof of clinical efficacy of Brahmi ghrita**, with a focus on age related cognitive decline using cognitive performance, clinical biomarkers like MRI (fMRI, DTI, MR spectroscopy, T1 weighted imaging) and blood parameters

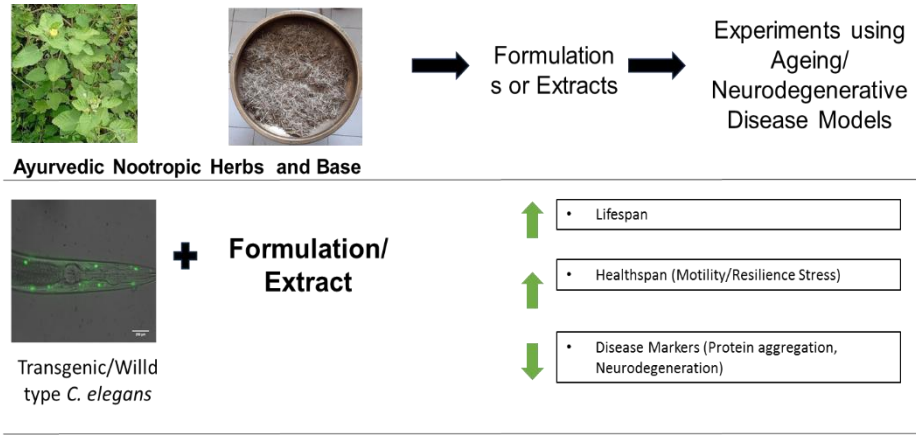
2. Analysis of clinically relevant formulations:
    a. Holistic strategy: Nootropic (good for nervous system health) and Anti-ageing effects of formulations are related
    b. Important Ingredients: The herbal ingredients and fat/lipid base of the formulations have protective properties, especially in case of age-related degenerative conditions
    c. Biological underpinning of effect of the formulations, namely Brahmi Swarasa, Brahmi Ghrita and Ksheerabala 101, using small animal models and cellular-molecular biomarkers for nervous system health

3. Interesting findings
    a. Advantages of fat base especially for mitigation age-related degenerative changes
    b. Strong correlation of Diabetes and Cognition in Indian urban population and possible solutions from Ayurveda

Bramhi formulations used in clinical research

Lab team





Ayurveda Biology and Holistic Nutrition

Glucose and Lipid Metabolism

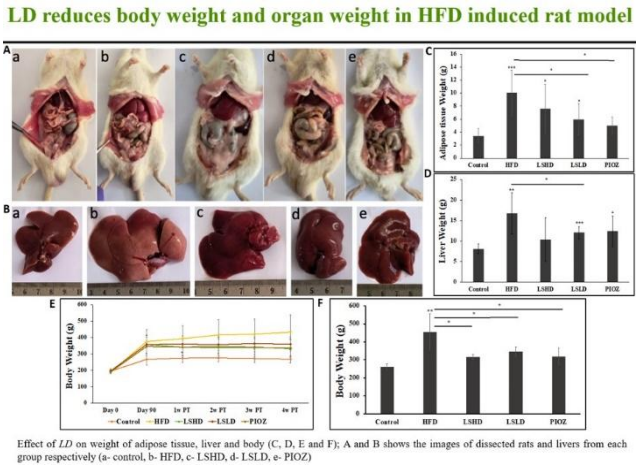
Sl. No	Title of research/outreach/ projects implemented during 2023-24	Source of funding	Team members associated with each project
1	Ayurveda Biology understanding of metabolic diseases	Internal Funding, RSIT	Sania Kouser, Abhi V Badiger, Subrahmanya Kumar, Vishnuprasad.

Relevance:
Effective merger of holistic and reductionist views of biology can lead to new discovery of products and process that can prevent and manage the chronic lifestyle diseases like diabetes, obesity and lever diseases.

Progress:
Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD) is a complex, multifactorial, and multi-system disorder. Given the complex interplay between adipose tissue and liver health, conventional single-target therapies have shown limited success. Therefore, polyherbal Ayurveda formulations, which may exert anti-steatotic and anti-adipogenic effects through multitargeted mechanisms, offer a promising alternative. Our lab is investigating the effects and underlying mechanisms of action of an Ayurveda formulation, *Lodhrasavam* (LD) on *in-vitro* and *in-vivo* models, with a focus on its impact on adipose tissue function and liver health.

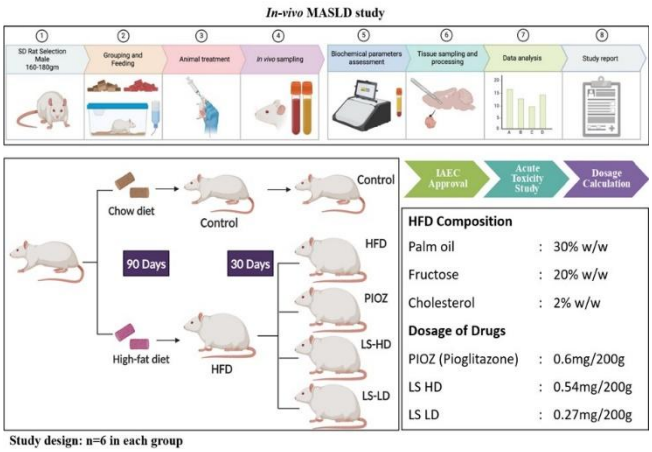
Treatment with LD significantly decreased intracellular triglyceride levels, lipid droplet formation, ROS levels and expression levels of genes in the in-vitro (3T3-L1 fibroblast) models. In High Fat High Fructose Diet (HFHFD) fed rats LD reduced the weight and increased glucose tolerance along with improving other parameters when compared to disease control animals. The study indicates that LD could be a promising multitargeted therapeutic candidate for MASLD and obesity.

Effect of LD on test animals



Effect of *LD* on weight of adipose tissue, liver and body (C, D, E and F); A and B shows the images of dissected rats and livers from each group respectively (a- control, b- HFD, c- LSHD, d- LSLD, e- PIOZ)

Workflow for In-vivo MASLD study



Study design: n=6 in each group

Ingredients of Kshamatva Churna)

Traditional Knowledge, Data Sciences and Informatics

Sl. No	Title of research/outreach/ projects implemented during 2024-25	Source of funding	Team members associated with each project
1	Ayurveda Pharmacology of Medicinal Plants	IKS division, Ministry of Education, Government of India	Dr. Subrahmanya Kumar K, Dr. Tabassum IF, Dr. Shilpa Naveen and Dr. Venugopalan Nair

The project is to develop an integrative pharmacology model by appropriate use of parameters of indigenous and western pharmacology. This work highlights the sophistication and complexity of Ayurvedic pharmacology and formulations derived thereof and lay the foundations for development of a new Trans-disciplinary field of 'Integrative Pharmacology' that combines the systemic and molecular approaches of the two knowledge systems.

Highlights

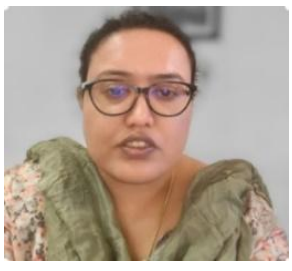
This project developed a methodology to study the Ayurvedic pharmacology for plant drugs of Indian medical systems through network pharmacology. Detailed Ayurvedic dravyaguana-rasapanchakaanalysis of medicinal plants based on the classical information from Ayurvedic treatises was also another achievement. More than 20 plant drugs and 3 compound formulations of Ayurveda were analysed. Some of the formulations like Bilvadi Gutika are complex because they use plant and animal origin drugs. Novel Ayurvedic formulations like 'Kshamatva churna' (Figure 1) is also studied using the integrative pharmacology.

The phytochemicals-molecular Pathway Analysis using modern network pharmacology tools to understand the biological pathways in which the identified targets are involved alongwith the visualization of the network was also achieved. Along with this, the project has developed education programs and gave training programs to the interested faculties, UG and PG students

Several interested students, both from Ayurveda and modern biology background are trained on the use and methods of integrative pharmacology. This is a new technique to study the complex, multi-ingredient therapeutic formulations.

A comprehensive database on integrative pharmacology of 20 clinically important plant drugs like Guduchi, shunti, yashtimadhu etc. and four compound formulations like Trikatu, Bilvadi gutika etc. in terms of bioactives, disease targets and pathways.

Team members




Ayurveda Biology and Holistic Nutrition- Megha

Sl. No	Title of research/outreach/ projects implemented during 2024-25	Source of funding	Team members associated with each project
1	(Research) Traditional Foods of Karnataka – A nutritional and ayurvedic perspective	AYUSH-CCRAS	Vaishali Jadhav Sadashiv Naik
2	(Research) Development of a fly model for assessing dietary protein quality	RIST	Debashis Rout
3	(Research) Evaluation of integrative diets in an observational cohort of cancer patients	None	Sonia Velarsan
4	(Research) Assessing the in vivo anti-oxidant abilities of commercially prepared spice mix	SaiSure	Jitika Bhatta
5	(Outreach) What should I eat? A nutrition module for adolescents. Master class for students of Azim Premji University	Azim Premji University	Srividya Vatsal

Photos of team members of group associated with all projects

Traditional Foods of Karnataka – A nutritional and Ayurvedic perspective

Relevance

India has diverse and rich culinary tradition. These have evolved by communities to suit agro-climatic conditions and cultural practices. Documentation projects are required to preserve this heritage and also, present it in a format so they endure. This project seeks to do so by developing a methodology for traditional food data collection, it's digital and written documentation, nutritional validation and assessment based on ayurvedic dietary principles.

Highlights:

- Karnataka was divided into 22 locations. ~1,500 dishes were collected after elaborate discussions with community members in each location. From these, 126 recipes were finally short-listed based on nutritional properties, uniqueness of ingredients and ayurvedic complementarity.
- Staff made field visits i.e., to the homes of community members to video record the preparation of the respective recipe. Total distance travelled: ~12,000Kms.
- Cereal consumption varies according to location. Jowar, Bajra are preferred in North Karnataka, while rice and it's various products, as well as tubers are preferred in coastal areas. In the south, rice and ragi are preferred. Plant protein sources also vary according to availability – dried bean, soaked pulse preparations are common in North Karnataka while fresh coconut-based preparations are common in coastal and southern Karnataka. These observations dovetail with ayurvedic food advise for different regions. Dry, arid climates should have cooling foods; while cooler regions should have warming foods. The choice of spices and food processing techniques such as steaming, frying, roasting etc., also reflect ayurvedic food principles. It was observed that traditional food preparations and their combinations are nutrient-rich.
- Recipes were canvassed from the community, hence enhancing the authenticity of the recipes as well as showcasing the power of people to people connection in the preservation of traditional knowledge. A youtube channel with the video-recorded recipe is a further innovation in documentation as a book is not easily accessible nor visually captivating for lay persons.

Food Futures and Holistic Nutrition

Report of work done during the year 2024:

The Food Futures and Holistic Nutrition Program aims to deliver food first solutions to health where health has three dimensions – human health, societal health (livelihoods & equity) and planetary health (environment). Food has a disproportionately high impact on all three of these dimensions. 70% of all non-communicable diseases are attributed to food choices. 60% of India's population earns its livelihood from food – growing, cooking or delivering it. 60% of habitable land, 90% of freshwater withdrawals, 20+% of greenhouse gases are attributed to food systems in India. The high species extinction is largely attributed to land-use change for food.

The food futures program is addressing this through 5 public health challenges – improving iron status, protein sufficiency for masses, gut health, cognitive health, metabolic health. Underpinning these five is an integrative personalized nutrition algorithm that synthesizes nutrition theories from modern nutrition, microbiome science and Ayurveda.

It has built the necessary infrastructure for translational research in the area of Food Futures. These include:

- Integrative food database which currently has 1200 ingredients, 200+ properties of ingredients (chemistry and Ayurveda pharmacology), 2500 recipes and excerpts from Ayurveda texts spanning 3000 years.
- A model food forest with 70+ species of wild edibles
- 15 labs & pilot plants for researching the physics, chemistry and biology of food and their interplay to design functional foods & value added ingredients

The program is building translational capabilities through multiple channels – (1) FPOs (2) Food Start-ups & Big Food (3) Hospitals (4) Dieticians & Nutritionists (5) Chefs (6) Forest Officers (7) Online platforms (8) General Public

Some of the highlights of 2025 are given below.

Laboratory & Pilot Plant Infrastructure

- We added a high end rheometer and a laser diffraction particle size analyser to strengthen our food physics capabilities.
- An air classifier mill and air classifier were added for dry fractionation to develop green technology for protein concentration and herbal actives
- Microprocessing facility with 50kg/day drying capacity for greens and amla has been setup to work with FPOs & SHGs

Our projects include:

- Low cost proteins for the masses through making plant-based pulse analogues which have digestibility scores matching egg.
- Dephytated millet flours with good dough making properties (extensibility & sheetability)
- Oilless nutrient dense snacks with high shelf stability – best-in-class incorporation of 60% non-pasting material in a snack form (no market product todays exceeds 20%).
- Stabilised oils and ghee by using natural antioxidants and its applications for healthy snacks for the masses
- Deoxalated & dephytated green high quality powder powders
- Bouquet of amla polyphenols for various beverage & food applications that enable consumption of 1 amla a day
- Wild edibles as a key pillar of Food Sytems for nutrition, livelihoods and biodiversity

22 functional food prototypes have been developed in TDU's research facilities. 4 patents were filed and high quality manuscripts have been published in peer reviewed international journals like Scientific Reports (Nature Group) and Food Chemistry (Elsevier Group).

The Food Futures program has quickly established a reputation in India a globally. 10+ invited talks were delivered in 2024 on Personalized Nutrition and on Food Innovation Inspired from Traditional Knowledge.

MoUs have been signed with 10+ organisations and industries to move the prototypes to Industry & FPOs and make them reach consumers for social impact including organizations such as Akshayapatra, Tata Consumer Product Limited, IKP Incubator and Jungle Lodges & Resorts.

MoUs Signed

IKP- KNOWLEDGE PARK PARTNERS

AKSHYA PATHRA

JUNGLE LODGES & RESORTS

Wild Edibles - Food Systems for Nutrition

Functional food prototypes have been developed

Team Members

Sl.No	Name	Designation
1	GURMEET SINGH	Faculty
2	ASHWINI GODBOLE	Faculty
3	VISHNU PRASAD C N	Faculty
4	PAVITHRA N	Faculty
5	SHRIDEVI GOTHE	Faculty
6	ASHWINI T	Faculty
7	LAVANYA DEVI K	Faculty
8	VARUNA SUBRAMANYAM	Faculty
9	MEGHA	Faculty
10	ATUL KUMAR GUPTA	Faculty
11	SWATHY PALIGIRI	Faculty
12	SWASTI MUDGAL	Faculty
13	TABASSUM ISHRATH FATHIMA	Faculty
14	SANTHOSHA N HEGDE	Faculty
15	MADHURIMA PANDE	Faculty
16	NOORUNNISSA BEGUM	Faculty

17	PRIYA JOSHI	Faculty
18	DHRUTHI BAL	Faculty
19	SHOVAN GANGULI	Faculty
20	UNNIKRISHNAN P	Faculty
21	SHILPA NAVEEN	Faculty
22	PRAKASH B N	Faculty
23	SUBRAHMANYA KUMAR K	Faculty
24	SUGANTHI FATHIMA J	Program Secretary
25	ESWARAPPA P	Staff
26	KUMARASWAMY	Staff
27	RAGHAVENDRA M	Staff
28	ABDUL MATEEN	Senior Research Fellow
29	MANOJ MADHAV MATHAPATI	Senior Research Fellow
30	MANISHA C P	Senior Research Fellow
31	ASHWINI THAKARE	Senior Research Fellow
32	DEBASHIS ROUT	Senior Research Fellow
33	SONIA VELARSAN	Senior Research Fellow
34	SAHANA S KULKARNI	Senior Research Fellow
35	NAMITHA	Senior Research Fellow
36	SANDRA DAS	Senior Research Fellow
37	RAJESWARI BALAJI	Senior Research Fellow
38	MADHURI HEGDE	Senior Research Fellow
39	SOHINI BERA	Senior Research Fellow
40	ANUGRAHA GEORGE	Senior Research Fellow
41	SREELAKSHMI T J	Senior Research Fellow
42	JISHAMOL SHAJI VS	Senior Research Fellow
43	SHARANYA G	Senior Research Fellow
44	VARALAXMI	Senior Research Fellow
45	NERAJA RASTOGI	Senior Research Fellow
46	DIPIN V M	Senior Research Fellow
47	MUTTUGOUD REVATAGANV	Post Doctoral fellow
48	DIVYA C	Post Doctoral fellow
49	ANANTHAKRISHNAN MOHAN	Post Doctoral fellow
50	BATUL DIWAN	Post Doctoral fellow
51	NARENDRA PENDSE	Consultant
52	VASUDEVAN NAMPOORTHY	Consultant

Clinical Research: IAIM Healthcare Center

Sl .No	Title of research/outreach/education projects implemented during 2024	Source of funding	Team members associated with each project
1	A. Outcomes of Ayurveda and Integrative management of cancer: An observational, descriptive study B. Outcomes of Ayurveda and Integrative management of infertility: An observational, descriptive study C. Outcomes of Ayurveda and Integrative management of Psoriasis: An observational, descriptive study D. Outcomes of Ayurveda and Integrative management of Diabetes: An observational, descriptive study	Rural India Support Trust [RIST]	A. Dr. Prasan Shankar, Dr. Radheshyam, Dr. Bhargavi, Dr. Megha, B. Dr. Poornima Devkumar, Dr Ashwini, Dr Preeti Bhat, Dr Flavia Shankar, Dr. Sivaranjini, C. Dr. Sahana Dr. Shashidhara, Dr. Shireen, , Dr. Viraj, D. Dr. Yashaswini, Dr. Mahesh, Dr. Shilpa, Dr. Vishnuprasad, Dr Poornima and Dr Prasan
2	Systems Biology approach to delineate molecular signatures of Prakriti in healthy humans	AYUSH-CCRAS	Dr Poornima Devkumar, Dr Ashwini Godbole, Dr Vishnuprasad, Dr Satish Rao, Gargi and Vikrant
3	Heart Attack and Stroke Predictability Study	SKAN	Dr. Prasan Shankar, Dr. Sanket, Dr. Subramanya, Dr. Vishnuprasad, Dr. Arun, Dr. Harikrishna, Prof Gurmeet, Prof Darshan Shankar, Vd. Narendra Pendse, SKAN team lead by Prof Yogesh Souche, NH team lead by Dr. Thimappa Hegde and Paul Salines
5	Supportive management of mucositis in chemoradiation	Internal	Dr Prasan Dr Sonali Dr Digpal dharkar Dr Kratika Kulkarni Dr Bhargavi

RIST CLINICAL STUDIES AT IAIM

Dr. Narendra Pendse

Dr. Unnikrishnan. P

Dr. Prakash B. N

CLINICAL STUDY TEAM ON CANCER

Dr. Prasan Shankar
PRINCIPAL INVESTIGATOR

Dr. Radheshyam
CO-INVESTIGATOR

Dr. Megha
CO-INVESTIGATOR

Dr. Bhargavi
RESEARCH FELLOW

CLINICAL STUDY TEAM ON PSORIASIS

Dr Sahana
Principal Investigator

Dr Shireen Furtado
Co- Investigator

Dr Viraj Bhatia
Research fellow

CLINICAL STUDY TEAM ON INFERTILITY

Dr. Poornima Devkumar
PRINCIPAL INVESTIGATOR

Dr. Aswini Mohan L
CO-INVESTIGATOR

Dr. Preethi Bhat
CO-INVESTIGATOR

Dr. Flavia Shankar
CO-INVESTIGATOR

Dr Veena , RF

CLINICAL STUDY TEAM ON DIABETES MELLITUS

Dr. Yasahaswini.G
PRINCIPAL INVESTIGATOR

Dr. C.N. Vishnuprasad
CO-INVESTIGATOR

Dr. Mahesh D.M
CO-INVESTIGATOR

Dr. Poornima Devkumar
CO- INVESTIGATOR

Dr. Prasan Shankar
CO- INVESTIGATOR

Dr. Shilpa babu
RESEARCH FELLOW

STUDY TEAM: SYSTEMS BIOLOGY APPROACH TO DELINEATE MOLECULAR SIGNATURES OF PRAKRITI IN HEALTHY HUMANS

Dr Poornima Devkumar
Principal investigator

Dr Satish P Rao
Technical advisor

Dr Vishnu Prasad CN
Co-Investigator

Dr Ashwini Godbole
Co-Investigator

Gargi Saha
S. Research fellow

Abhi V Badiger
J.Research fellow

STUDY TEAM: SKAN: HEART ATTACK AND STROKE PREDICTABILITY (HASP) STUDY

Dr Prasan Shankar
Principal
Investigator

Dr Sanket V
Sharma
Co- Investigator

Dr Subrahmanya
Kumar K
Co- Investigator

Dr C.N
Vishnuprasad
Co- Investigator

SENIOR RESEARCH FELLOWS

Dr Arun Bhanu K

Dr. Shravanthi S

Dr. Amritha Sindhu

Dr. Harikrishnan M

Study team: Systems biology approach to delineate molecular signatures of prakriti in healthy humans

Clinical observational studies supported by RIST: Outcomes of Ayurveda and Integrative management in Cancer, Infertility, Diabetes mellitus and Psoriasis

Background: Real-world evidence (RWE) plays a crucial role in hospitals and healthcare systems for several reasons like Informed decision making, Improved patient outcomes, understanding treatment effectiveness, cost effective analysis etc. They will also help in designing clinical trials with tested protocols. With this intention, IAIM has initiated 4 observational studies with the support of RIST (Rural India Support Trust) in the areas of Cancer, Infertility, Psoriasis and Diabetes. These studies aim to collect real-world data (RWD) in a systematic way using carefully chosen tools from Ayurveda and modern sciences to improve Real World Evidence.

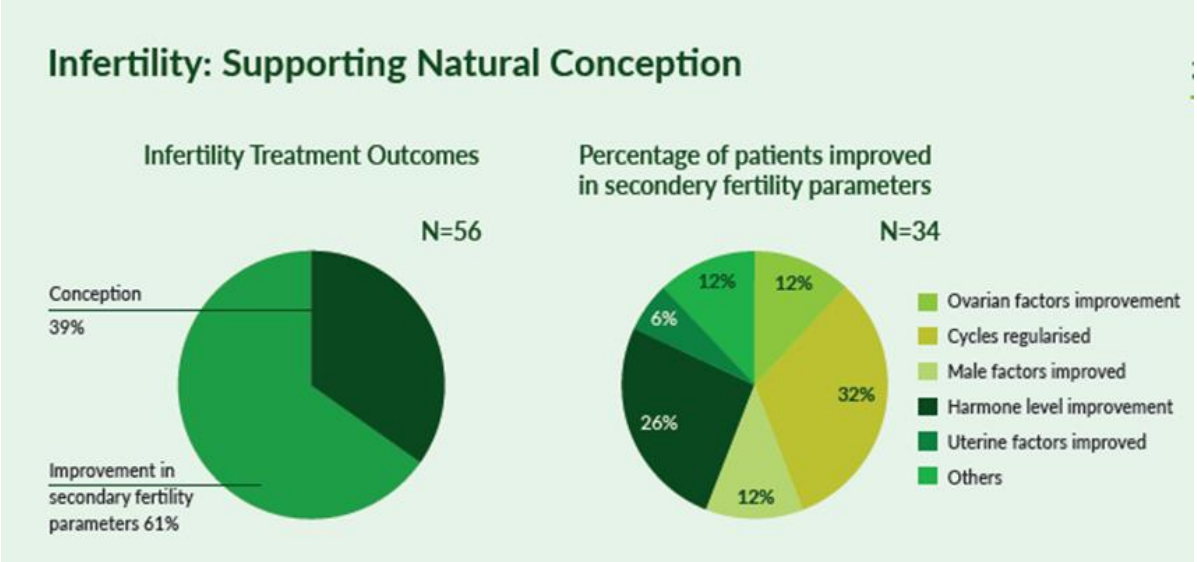
Highlights

- The clinical studies initiated with screening of patients, recruitment data collection and analysis of the data.

1. **Outcomes of Ayurveda and integrative management of infertility-an observational, descriptive study.**

Objectives:

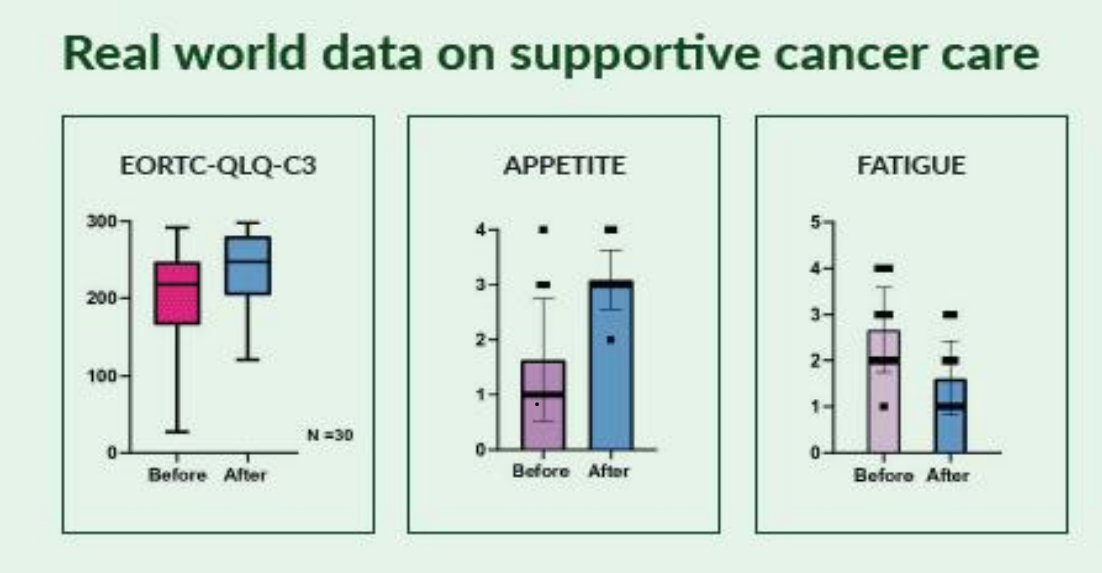
- To systematically document and assess the outcomes of infertility cases with parameters of Ayurveda, contemporary sciences, related investigations, and treatment outcomes.
- Document the effect of Ayurveda management on secondary influencing factors of infertility like sleep, stress of an individual that helps in conception.



2. **Evaluating the impact of Ayurveda interventions on cancer patients: A prospective observational study.**

Objectives:

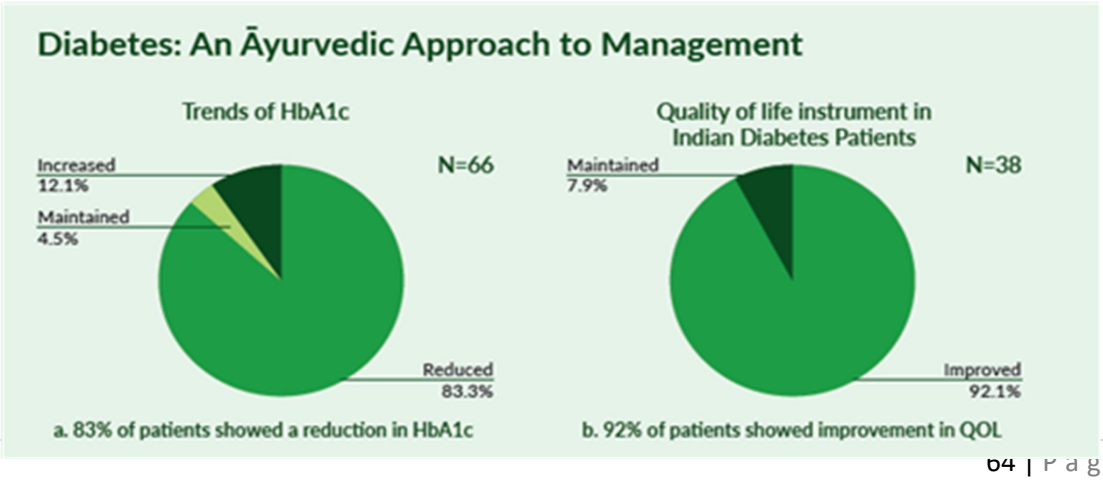
- Periodically measure quality of life using EORTC-QLQ-C30, ECOG
- To understand the association between Ayurvedic health parameters and EORTC-QLQ-C30, ECOG, weight and biochemical parameters



3. **Outcome of Ayurveda and integrative management of Diabetes mellitus: an observational descriptive study**

Objectives

- To systematically document the data of patients seeking Ayurveda management in the management of Madhumeha (DM -2)
- To evaluate the outcomes of data with reference to the effect and safety of Ayurveda in the management of Madhumeha (DM – 2)



4. **Outcome of Ayurveda and integrative management in Psoriasis: An observational descriptive study.**
    - Objectives: To systematically document and evaluate the outcomes of Ayurveda Standard of care in psoriasis patients using Psoriasis Area and Severity Index (PASI).
    - To evaluate the outcomes of Ayurveda Standard of Care on Quality of Life (QOL).

Observations:

5. **Systems Biology approach to delineate molecular signatures of Prakriti in healthy humans.**

Exosomes are multivesicular bodies which are used as biomarkers due to their specificity and availability in various biofluids. This study aims to analyze urine exosome profiles from 392 healthy male individuals in India, classified into 7 Ayurvedic prakriti types. By understanding the biomarker relevance of these types at two different time points, the research seeks to determine disease susceptibility and correlate biological pathways to disease profiles.

Highlights of progress

- Collection of the samples completed
- Exosome isolation of the samples completed.
- Mass spectrometry of all the samples is being done.
- Data analysis is being done to select top proteins unique to each Prakruti through non proteomic validation.

6. SKAN: Heart Attack and Stroke Predictability Study

Background:

Cardiovascular diseases are the leading cause of death globally. An estimated 17.9 million people died from cardiovascular diseases in 2019, representing 32% of all global deaths. It is also evident that the available models are insufficient in predicting and preventing CAD and CVD, requiring newer models. There is evidence that shows that integrative intervention involving Ayurveda can help in preventing/slowing the progression of CAD, warranting a need for an integrative tool that takes into consideration looking at complex correlations between gut-brain axis, Prakriti, Ama, Swasthya and Ayurveda's understanding of heart disease and stroke.

Aim:

To test the feasibility of developing a tool for risk predictability of Stroke and Heart attacks, specific to the Indian population, utilising holistic data from across Allopathy and Ayurveda medicine before conducting a large cohort study.

Progress:

- The development of web-based and mobile-based applications for data collection and management was completed.
- Standee posters were created, and flyers were distributed to advertise the study. Outreach programs were also conducted for the same.
- Participant recruitment began in July 2024, with 146 participants recruited by December 2024, along with their blood, urine and stool sample collection.

- The following questionnaires were used to collect the data of participants:

    1. **Prakriti Questionnaire:** A set of 62 questions designed to assess the Prakriti of an individual based on the predominance of the Doshas.
    2. **Swasthya Questionnaire:** A set of 97 questions designed to assess the wellness of an individual. It is divided into 11 sections - Agni, Kostha, Mala, Niramata, Manas, Indriya, Nidra, Adharaneeya Vega, Dharaneeya Vega, Vyadhi Kshamatwa & Ojas, and Vyayama.
    3. **Hridroga Vatavyadhi Prediction Questionnaire:** A set of 91 questions designed to predict the risk of heart attack and stroke by assessing their risk factors. It is divided into 5 sections - Ama, Vegadharna, Dushya Nimitta, Hridroga Nimitta, and Vata Vyadhi Nidana.

Participants recruitment and sample collection

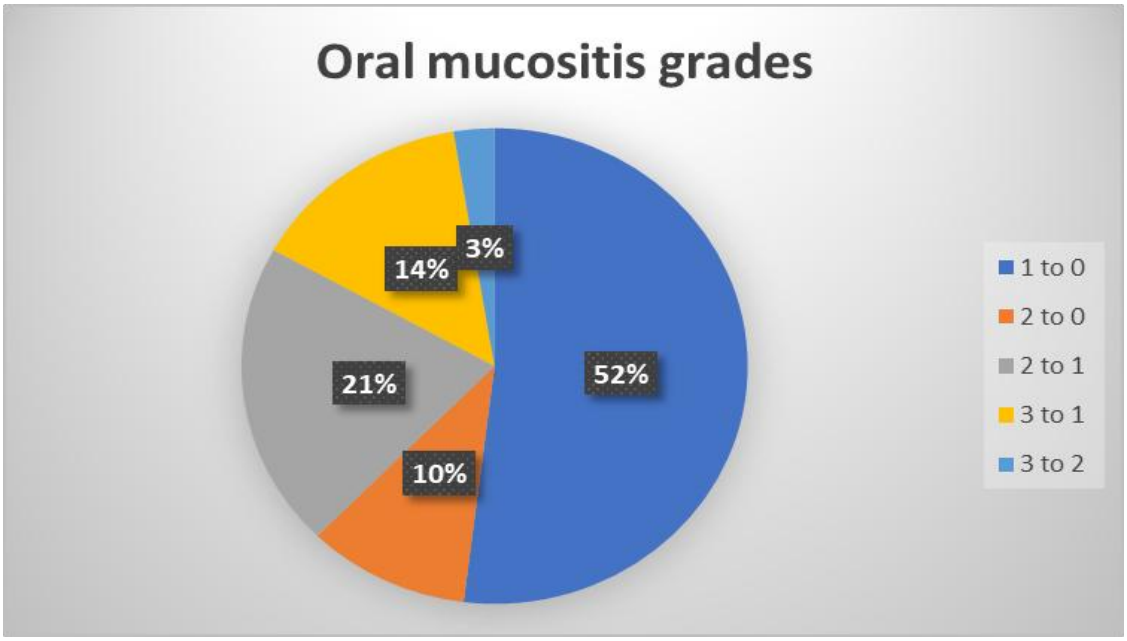
7. Ayurveda management of radiation and chemotherapy induced oral mucositis: A retrospective study

Mucositis remains a major cause of morbidity in patients receiving radiation therapy for head and neck cancers, particularly oral cancers. Depending on the dose, the technology of treatment delivery systems, and the stage at which patients present, it is estimated that 90 to 100% of patients suffer from it.

The problem is compounded in patients receiving concomitant radiation and chemotherapy, not an uncommon situation of oral cancers being detected late. IAIM carried out a joint study at the Indian Institute of Head and Neck Oncology, a charitable cancer centre in Indore where 80 patients who were undergoing chemo-radiation and presented with oral mucositis were analyzed.

These patients were treated with an Ayurveda gargle regimen (AGR) as an adjuvant with chemotherapy and radiation. Regular follow-ups were done and documented by an institute medical staff.

IMPROVEMENT IN ORAL MUCOSITIS THROUGH AYURVEDA



1. OUTREACH: Health camps conducted at various places in and around Bangalore

A total of 8 health camps, including two mega health camp, were organized at various strategic locations in and around Bangalore including at IAIM, catering to over 600 grateful patients.

Mega health camp conducted on 17th March 2024

On March 17, 2024, as a mark of the institutional day, a mega health camp was held, offering free consultations and discounts on medications. The event was graced by Mrs. Ramola Bacchan as the chief guest.

Mr. VS Bobba, a generous donor and supporter of IAIM, was honoured during the occasion in recognition of his contributions. A total of 303 patients benefited from the services provided, which included free consultations, blood sugar check-ups, vital sign assessments, and bone mineral density tests.

Mr. V S BOBBA being felicitated for his support to IAIM. Mrs Ramola Bacchan was the chief guest.

Registration of the patient's

Bone Mineral Density checkup

Blood sugar check up - diabetes screening

Health camps for the villagers

Health campus at various villages around Bangalore

2. Mega health camp conducted on 2nd December 2024 inaugurated by Justice Santosh Hegde

On December 2nd 2024, Justice Santosh Hegde inaugurated the free medical camp at IAIM. The event was attended by around 200 health seekers. The camp included free consultations, Free blood sugar checks along with Bone mineral Density check (BMD). The medications were also distributed in a subsidised rate.

Justice Santosh Hegde appreciated the noble initiatives taken at IAIM for the economically weaker sections and encouraged the institute to continue.

Justice Santosh Hegde inauguration of the free health camp on December 2025

3. Workshop on Pratisaraniya Kshara preparation and its clinical applications - November 8th 2024

As part of the hospital's clinical training activity for practitioners by the Shalya team, a workshop on the preparation of pratisaraniya Kshara was organized at IAIM-TDU on November 8, 2024, from 9 a.m. to 5 p.m. For this purpose, pioneers in the field of Shalya tantra and kshara application—Dr Ravi Shankar Pervaje and Dr Ramesh Bhat—were invited as resource persons.

A total of 40 participants registered for the workshop. Eleven of these were postgraduates, and the rest were graduates.

The main objective was for the Practitioners to learn the skill of Pratisaraniya Kshara preparation, understand its clinical application, and thus continue to learn. The 1st session was a practical session by Dr.Pervaje which started with the step-by-step preparation of the Pratisaraniya Kshara which was conducted on the terrace outside the conference hall. The hands-on experience was there for all the participants during the preparation. The session was very interactive with practical insights by Dr.Pervaje and culminated at around 1.30 pm with the final preparation of Kshara. The 2nd session was conducted by Dr Ramesh Bhat, where he shared his clinical experience in the management of Anorectal conditions with special reference to the management of Fistula in ano.

Kshara preparation and the sessions

Ksharakarma workshop participants

EDUCATION PROGRAMS

Regarding report on Academic programs implemented by the Community Health

For each program

Sl. No.	Title of the program	No. of students and Highlights of the program
1	Internship at Community Health	• 5 from M S Ramaiah University of Applied Sciences
2	Varmam Therapist Diploma Program	• 16 students certified. • Learnt Varmam Therapy for ailments like knee pain, frozen shoulder, neck pain, spinal alignment, spinal disorders like cervical and lumbar compression, headaches, and psychosomatic disorders
3	IPH eLearning courses: eRM (Certificate Course in Research Methods)	• students certified • Helps the student to develop clear and well formulated research questions, research designs and methods

Institutional Ethics Committee (IEC)

The Transdisciplinary University has an Institutional Ethics Committee (IEC) responsible for reviewing all clinical research protocols involving human participants. The IEC ensures the rights, safety, and well-being of research participants are protected. It conducts regular meetings to review proposals, offering guidance and suggestions to help investigators align their studies with ethical standards. The committee evaluates the scientific, medical, and ethical aspects of each project to ensure impartiality and prevent any undue influence. No research involving human participants can commence without prior IEC approval. The IEC also provides ongoing advice to researchers on participant welfare, including the scientific soundness of the study.

The Institutional Ethics Committee (IEC) of TDU has been provisionally registered under the National Ethics Committee Registry for Biomedical and Health Research (NECRBHR) on 3rd July 2024. This registration was granted by the Department of Health Research (DHR), Ministry of Health and Family Welfare, Government of India. The IEC registration number is **EC/NEW/INST/2023/3903.**

The 15th Institutional Ethics Committee (IEC) meeting was held on 12th June 2024 at TDU, Bangalore. A total of three research protocols were reviewed during the meeting with the participation of 10 IEC members. Additionally, one protocol was reviewed through the expedited review process.

Regarding report on Academic programs implemented by the Functional Genomics and Bio-informatics

Title of degree/ diploma / certificate program: PhD, MSc in Biological Sciences (Bio-informatics and Functional Genomics by Research), Intersnhips, Symposium

No of students:
PhD:
Guide: 4 students
Co-guide: 5 students

MSc in Biological Sciences (Bio-informatics and Functional Genomics by Research)
No. of Students: 3

Symposium: National Symposium on Future of Functional Genomics- Jan 2025
No. of participants: 53

Skill based Internships
No. of Students: 1

Project based Internships
No. of Students: 4

Table 2: List of faculty involved in different Academic Programs

Sl. No	Name of faculty	Topic (s) taught
1.	Dr.Pavithra N	NGS, Bioinformatics
2.	Dr. Gurmeet Singh	Nutrition

Regarding report on Academic programs implemented by the Conservation- Dr. Abdul Kareem: Knowing the unknown!

Education program/ outreach: Knowing the unknown!

i. Title certificate program: Knowing the unknown!!
ii. No of students: 120 (Rishi Valley school and TALC school)
iii. Goals of program:

The University of Trans-Disciplinary Health Sciences & Technology (TDU), Bengaluru has initiated a nature appreciation program for the students for Higher Secondary and High Schools children's. This program helps children to understand and appreciate our country's natural resources and learn how to conserve those resources for future generations through activities with scope for hands-on experience, observation, experiments and outdoor learning, to enable the develop necessary interest in the environment. Although the existing school curriculum lays emphasis on the environment and its conservation, the corresponding practical exposure to the nuances is lacking, assert the educationist.

iv. Feedback of students:

It was a general perception among students that only a few plants are medicinal. However, they found that most of the plants have medicinal value after undergoing this orientation program. The practical sessions on anatomy were very useful particularly for those students who like to pursue a career in life sciences. A basic understanding of uses of medicinal plants for primary health care was also notable. A fun activity on food chain, puzzles and importance of water was also taught. We also sensitized them on how important it is to protect the natural habitat of the flora and fauna.

Table 2: List of faculty involved in different Academic Programs

Slno	Name of faculty	Topic (s) taught
1.	Dr. Submaranya Kumar and Dr. Arun Banu	Uses of medicinal plants for primary health care
2.	Dr. M. Abdul Kareem	Introduction to Ethno botany
3.	Dr. Noorunnisa Begum and Mr. Arun Kumar	Plant Anatomy and Herbarium techniques
4.	Mr. Vrijulal,	Diversity of Birds
5.	Dr. Prasan Shankar	Motivational talks
6.	Ms. Amrita G and Dr. Nandini D	Tour to ethno medicinal garden and Medicinal plant identification and games on Biodiversity conservation

Regarding report on Academic programs implemented by the Conservation- Herbarium:

Ph.D. completed:
Ms. Sathya Sangeetha (Reg. No. 21215010107), completed her Ph.D viva on research titled "Impact of Root Harvest on the Population Status, Survival, Yield and Reproduction of the Woody Climber Decalepis hamiltonii Wight & Arn. in Savandurga Reserve Forest, Karnataka, India" under the guidance of Dr. K. Ravikumar, Professor, on 18th December, 2024.

Certification course
Certificate course in Museology 4 credit course was completed. Totally 09 students completed the course successfully. The students were curators of museums, researchers and students.

Outreach activities:

Sunday Walk
Sunday Walk was organized for the Nature enthusiasts on the identification of Medicinal plants. 29 participants form diverse fields participated in these walks. These walks were held on the last Sundays of December 2024 and February 2025.

Workshop
Food adulterants workshop was conducted at 2nd symposium titled Wildlife Forensics-Conservation, Crime and Prevention (WFCCP-2025)" at Jain University, Bangalore on 23rd January 2025. 40 students from forensic and life science background participated in the workshop.

Outreach program

- Organised Faculty experiential learning and skill enrichment program for 25 teachers of Kristu Jayanti College at TDU on 19th June, 2024 at TDU, Bangalore.

- Two days "training on identification of medicinal plants using modern tools and techniques" was conducted for BAMS of Ramakrishna Ayurvedic college, on 26th & 27th June, 2024. Totally 98 UG students participated the training program.

- TDU University, on 22nd august 2024, about 50 students along with 2 teachers from Harsha college of Pharmacy, Bengaluru, visited FRLH Herbarium, Molecular lab, Phytochemistry lab and ayurbiology lab. They also visited IAIM hospital and pharmacy. They saw native medicinal plants at ethno medicinal garden and enjoyed at labyrinth.

- At the College of Horticulture, UHS Campus GKVK Post, Bengaluru , Dr. S. Noorunnisa Begum took session on Ethnobotany survey, Documentation and Cataloguing of wild edibles" on 27.02.2025 as part of Integration of Traditional

Knowledge and Metabolomics Approaches in Prospecting of the wild edible plant genetic resources for food and health program'.

- Ashutosh Sharma delivered invited guest lecture on 'Recent advancement in Plant Systematics' and 'Unveiling the enigmatic world of Balsams of Himalayas' at Kaliabor College, Assam on 27 November 2024.

Regarding report on Academic programs implemented by the Conservation

Mr. B S.Somashekhar

1.	1- week Compulsory Training course for IFS officers on ***Conservation and Resource augmentation of Medicinal plants in Forest landscapes***	Ministry of Environment, Forests & Climate Change (RT), Govt. of India, New Delhi	**PI: Somashekhar B S,** Team: Atul Kumar Gupta
2.	3-day Training course on ***Conservation and Sustainable Use of Medicinal Plants*** for State Forest Service Officers	Central Academy for State Forest Service, Coimbatore	**PI: Somashekhar B S,** Team: Atul Kumar Gupta

PROJECT 1: One Week Compulsory Training course for IFS officers on *"Conservation and Resource augmentation of Medicinal plants in Forest landscapes"*

Relevance: Indian Council for Forest Research & Education, Dehradun is the umbrella body for Forestry Education in India. It regularly organises training to forest officers to build their technical and management capacities. TDU being the knowledge partner on Medicinal Plants Conservation, was entrusted the task of providing training to officers from Indian Forest Service. During the current year, MOEF&CC, Govt of India sanctioned 3-day Training workshop on **"Conservation and Resource augmentation of Medicinal plants in Forest landscapes"**.

Highlights:

Shri G. A. Sudarshan IFS, CEO, Karnataka Medicinal Plants Authority, Bengaluru, delivering the inaugural address during the inauguration of the Training Course for IFS officers (photo credit: Somashekhar B S)

The Training workshop was organized during 8-12 January, 2024 at Bengaluru. Forty senior forest officers from different states were nominated for the course, of which 24 officers confirmed their participation, however finally 12 officers attended the Course. The program was structured around the following major themes:

a) Diversity profile of endangered and threatened medicinal plants,
b) Factors that determine the threats to medicinal plants,
c) Status of demand, supply and trade, and Cultivation of medicinal plants,
d) Insitu conservation strategies for medicinal plants conservation-MPCA and MPDA model,
e) Approaches and models for augmentation of medicinal plants resources
f)

The technical sessions adopted a participatory approach with sufficient scope for learning from peer groups, experience sharing, field visits, group discussion, interactions with faculty/scientists and multi-media presentations. All the sessions witnessed an overwhelming participation, as result of latest and case study based contents delivered by invited subject experts. The course evaluation score by the participants was 9.2 out of 10.0, which indicates the higher level of acceptance of the course by the officers.

PROJECT 2: Three day Training course on *"Conservation and sustainable management of Medicinal plants"* for State Forest Service Officer Trainees from Central Academy for State Forest Service, Coimbatore

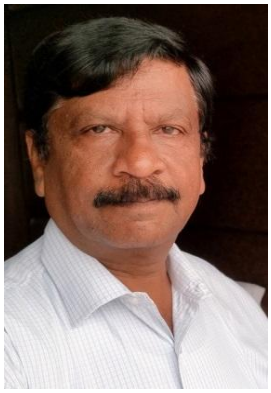
Relevance: Indian Council for Forest Research & Education, Dehradun is the umbrella body for Forestry Education in India. The Central Academy for State Forest Service (CASFOS), Coimbatore, under ICFRE regularly organises training to State Forest Service officers to build their technical and management capacities. TDU being the knowledge partner on Medicinal Plants Conservation, was entrusted the task of providing short term training on **"Conservation and sustainable management of Medicinal plants"** to the Officer Trainees of State Forest Service of 2023-25 batch.

Highlights:
Keeping in view the learning needs of the Officer trainees, the TDU team designed the 3-day Training module and conducted the course in 2 segments: firstly, a field visit to TDU, Bengaluru on 17th September 2024, followed by 2-day workshop during 3-4th October 2024 at CASFOS, Coimbatore.

The program was structured around the following major themes:

a) Diversity profile of endangered and threatened medicinal plants,
b) Factors that determine the threats to medicinal plants,
c) Status of demand, supply and trade, and scope for Cultivation of medicinal plants,
d) Insitu conservation strategies for medicinal plants conservation-MPCA and MPDA model,
e) Approaches and models for augmentation of medicinal plants resources
f) Legal provisions for conservation of Medicinal plants

The technical sessions adopted a participatory approach with sufficient scope for peer group discussion, field visits, and interactions with faculty/scientists and multi-media presentations. Context specific and need based contents relevant to the Home State of the officers was included in the module, and as a result of which, all the sessions witnessed an overwhelming participation, by the officers who also provided positive feedback about the relevance of the course contents.



Mr. B S.Somashekhar

Regarding report on Academic programs implemented by the Ayurveda Biology and Holistic Nutrition – Dr. C. N. Vishnuprasad

For each EDUCATIONAL program

- Title of degree/ diploma / certificate program - M.Sc Life Sciences (Ayurveda Biology)
- No of students - 5
- Goals of program - To develop a cadre of next-generation young scientists with technical capability to combine the systemic and molecular perspectives of Ayurveda and Biology, to solve problems of today and tomorrow in frontier areas of life sciences
- Feedback of students
- Photographs of teaching learning process
- Table on faculty involved as per Table 2 below

Table 2: List of faculty involved in different Academic Programs

1	Dr. C. N. Vishnuprasad	Program Coordinators
2	Dr. Megha	

Sl. No	Name of faculty	Topic taught
1	Dr. Abdul Kareem	Principles of Conservation of Biodiversity
2	Dr. Ashwini Godbole	Cell biology and cell signalling
3	Dr. Atul Kumar Gupta	Principles of Conservation of Biodiversity
4	Dr. M.N.B Nair	Medicinal plants and pharmacognosy, Medicinal plants and pharmacognosy lab
5	Dr. Datchanamoorthy	Medicinal plants and pharmacognosy lab
6	Dr. Girish Kumar	Fundamentals of Ayurveda, Medicinal plants and pharmacognosy.
7	Dr. Lavanya	Molecular Biology and Genetics, Genomics and Bio-informatics
8	Dr. Megha	Biochemistry, Basics of Plant and Animal Physiology, Biochemistry and Molecular Biology lab
9	Dr. Noorunnisa Begum	Medicinal plants and pharmacognosy, Medicinal plants and pharmacognosy lab
10	Mr. Patturaj	Medicinal plants and pharmacognosy lab
11	Dr .Pavithra	Genomics and Bio-informatics
12	Dr. B.N.Prakash	Local health traditions and community health
13	Dr. Prasanna Koti	Computational Biology, Genomics and Bio-informatics
14	Dr. Saha	Ecological Principles
15	Dr. Subrahmanya Kumar	Fundamentals of Ayurveda, Integrative Immunology, Medicinal plants and pharmacognosy
16	Dr. C. N. Vishnuprasad	Cell Biology, Integrative Immunology, Biochemistry and Molecular Biology lab

Regarding report on Academic programs implemented by the Traditional Knowledge, Data Sciences and Informatics by Dr. Subrahmanya Kumar

- Title of the certificate program: Introduction to Ayurvedic Pharmacology for Biologists. (IKS minor program, developed and submitted to the IKS division of MoE. Yet to be launched)
- No of students:
- Goals of program: To enable the learner to gain insights from discovering relationship between systemic perspective of Ayurveda and molecular parameters of biology by providing essential information and the tools required to achieve the same
- Feedback of students: -NA-
- Photographs of teaching learning process: Online program
- Table on faculty involved as per Table 2 below: NA

Regarding report on Academic programs implemented by the Ayurveda Biology and Holistic Nutrition - Dr. Megha

- Title of certificate program: Introduction to Ayurveda Dietetics
- No of students: 250 +
- Goals of program: Educating participants about food concepts in Ayurveda and how they work with modern nutrition principles.
- Feedback of students: More than 90% of participants felt it was worth the money and would recommend it to a friend.
- Photographs of teaching learning process: Online class
- Table on faculty involved as per Table 2 below

Table 2: List of faculty involved in different Academic Programs

Slno	Name of faculty	Topic (s) taught
1	Madhumitha Krishnan	

- Title of certificate program: Advanced Ayurveda Dietetics
- No of students: 38
- Goals of program: The next level after the introductory. Specifically for professionals to increase their knowledge on Ayurveda dietetic concepts for clinical applications

- Feedback of students: While the topics were appreciated, course duration was reported to be too short.
- Photographs of teaching learning process: Online class
- Table on faculty involved as per Table 2 below

Table 2: List of faculty involved in different Academic Programs

Slno	Name of faculty	Topic (s) taught
1	Madhumitha Krishnan	
2	Sanket Sharma	
3	Subrahmanya Kumar	

- Title of certificate program: Applied Nutrition Science
- No of students: 43
- Goals of program: Educating physicians about the latest concepts in nutritional biochemistry and dietetics for application to their clinical practice.
- Feedback of students: 60% “liked it very much” while the rest were ambiguous. Diet planning aspects were appreciated by all students. Course fees was found to be high.
- Photographs of teaching learning process: Online class
- Table on faculty involved as per Table 2 below

Table 2: List of faculty involved in different Academic Programs

Slno	Name of faculty	Topic (s) taught
1	Megha	
2	Sonia Velarsan	

- Title of certificate program: Internship in Ayurveda Dietetics
- No of students: 3
- Goals of program: To complement theory classes held in the Introductory course, an offline immersive course in preparation of dietary charts that incorporate ayurveda and modern principles.
- Feedback of students: Course was expensive but enjoyable.
- Photographs of teaching learning process: none taken
- Table on faculty involved as per Table 2 below

Table 2: List of faculty involved in different Academic Programs

Slno	Name of faculty	Topic (s) taught
1	Megha	
2	Sonia Velarsan	

Regarding report on Academic programs implemented by the Food Futures and Holistic Nutrition - Dr. Gurmeet Singh

The first full year of the MSc by Research in Food Science, Processing & Innovation was completed with a cohort of 5 students. The program has added five new faculty so as to ramp up student intake over next few years. The program is highly focused on giving cutting edge research exposure to its students and so keeps the intake low.

The PhD program is coming along well with 3 PhDs granted and 10 enrolled.

A Food Futures Interns program has been developed offering experiential internships to food science & allied field bachelors & masters students 1 to 6 month internships. Nearly 200 intern months have been done over last two years.

A Food Futures Champions program has been initiated for high school students and non-food college students to illustrate through food-based interesting science experiments the impact of our food choices on our health & planets health. 200 students were covered in this program last year.

Regarding report on Academic programs implemented by the Vocational Education Cell (VEC)

With the introduction of programs in the Hospitality sector in September 2023, marking the third academic year of operations, TDU now runs vocational programs in 4 sectors of the economy namely: i) Healthcare; ii) Food Sciences and Technology; iii) AYUSH; and iv) Tourism and Hospitality. In the future, we propose to add several new sectors such as Electronics, Information Technology, and Life Sciences among others.

TDU signed up a new partner in Bangalore, 'Indian Culinary Academy', to offer three new Bachelor of Vocation programs that are full-time apprenticeship based as the previous ones:

- B.Voc in Culinary Arts in Bengaluru;
- B.Voc in Bakery and Pastry Arts in Bengaluru; and
- B.Voc in Hotel Management in Mysuru

TDU also continued with its own vocational programs that were started in academic year 2022-23:

- Diploma in Panchakarma Therapy and Nursing Aide; and
- B.Voc Food processing and Technology.

Lastly, TDU continued with its flagship Healthcare programs at Nipani, that were launched in the academic year 2021-22:

- B.Voc in Medical Laboratory Technology (MLT);
- B.Voc in Medical Imaging Technology (MIT); and
- PG Diploma in Medical Laboratory Technology.

The apprenticeship-based model, also known as the work-integrated-model, has been established to be one of the best ways to help students obtain On-Job-Training (OJT) in real life situations, on state-of-the-art infrastructure available with companies. However, the popularity of these programs and the enrolment in them would have been much higher had the program been renamed to a B.Sc./B.A/ B.Com. This renaming has not yet been done by the UGC despite the recommendations of a committee set up for the purpose by UGC itself, and despite multiple representations from us.

Although the year began well, the admissions for the academic year 2024-25 were disastrously low, for a second reason. Students of TDU's healthcare programs have not been able to obtain a license to practice due to the fact that the Govt. of Karnataka had not yet up the Karnataka Allied and Health Sciences Council, despite the Govt. of India requiring it to be set up before the end of 2021. Eventually the announcement of this body came in October 2024 (too late for admissions in AY2024-25), and the rules for setting up the Council were notified in December 2024. We are hoping that the Council will begin operations in early in 2025, in time to ensure that enough students become confident of their license, and enroll in our programs.

We began the year with 117 students on roll and completed it with 109 students on roll after the graduation of 88 students and a few dropouts. Since we did not all many enrolments in July/ August 2024, we are far from the 200-250 students that we normally have had on roll at this time of the year, as of August 2021.

Highlights:

- TDU attained a major milestone when the first batch of 62 students, who began their studies in October 2021, during the pandemic, completed their B.Voc (MLT) and B.Voc (MIT) degrees in July 2024. They received their degrees in the convocation that was held in April 2025, along with a second batch that graduated in January 2025. In all 88 students received their degrees at the convocation.
- Surveys conducted among these and other B.Voc students at various locations indicate that they receive stipends ranging between Rs 12,000 to Rs 18,000, from the second year of OJT. This is extremely encouraging and is likely to bring in more students into the B.Voc programs.
- Surveys also indicate that students are happy with TDU's model of conducting in-person theory classes which allow students to meet and engage in peer learning. Students undergoing OJT with different employers are also able to compare notes about their learning opportunities at work.
- Students were eagerly awaiting the renaming of the B.Voc program into BA/BSc/BCom programs as appropriate, as recommended by the committee set up by UGC to review the BVoc program in July 2023. Since UGC has not yet announced any guidelines/regulations in this matter, the University took a decision to rename the degree to B.Sc., in line with what many other universities have done. 81 of the 88 students received B.Sc degrees at the convocation. 7 received a PGDMLT.
- TDU is interacting continuously with the Government of Karnataka to track the setting up of the 'Karnataka Allied Health Sciences Council'. Once this body is operational, it is expected to register all universities engaged in healthcare courses, examine their curriculum and issue a 'license to practice' for all allied healthcare workers.

This year the first batch of students who joined TDU's programs through the 'Indian Culinary Academy' visited TDU to get introduced to the university. They toured the campus with VEC team members Dr Chetan and Ranjith and visited the scientific kitchen and labs of the 'Food Futures' program. We also made one of our regular visits to our partners at Nipani, to meet the partners and students to ensure that classes and the apprenticeships are running smoothly. One of the pictures taken by Ranjith during the visit is also included here.

Figure 1. Students of the B.Voc Culinary Arts program at the Indian Culinary Academy visiting TDU. Also seen in the picture are VEC members Dr. Chetan and Ranjith.

Figure 1. Students of the Indian Culinary Academy visiting TDU's 'Food Futures'

laboratories and interacting with Dr. Shridevi Gothe

Figure 2. Students of the Medical Laboratory Technology program undergoing On-Job-Training (OJT) at Nipani, in North Karnataka

The following three new courses were introduced at the Indian Culinary Academy in Bengaluru and Mysuru:

1.1. B.Voc in Culinary Arts: Number of students 21

Table 1: List of faculty members involved in the Program

Sl. No	Name of faculty	Topic (s) taught
1	Kumar Saurav	Fundamentals of Culinary Arts I and II, Vocational Practical
2	Vikas Jain	Food Science and Nutrition
3	Madan	Hotel Law
4	Pradeep Singh	Bakery and Patisserie
5	Antony Vijayendran	Computer Applications and Hotel Industry

1.2. B.Voc in Bakery and Pastry Arts: Number of students 4

Table 2: List of faculty members involved in the Program

Sl. No	Name of faculty	Topic (s) taught
1	Srijita Chanda	Fundamentals of Bakery and Confectionary Art I, Cake Engineering
2	Kumar Saurav	Fundamentals of Bakery and Confectionary Art II, Vocational Practical, Food Science and Nutrition
3	Sailesh Dewan	Hotel Law
4	Antony Vijayendran	Computer Applications and Hotel Industry

1.3. B.Voc in Hotel Management: Number of students 5

Table 3: List of faculty members involved in the Program

Sl. No	Name of faculty	Topic (s) taught
1	Vineeth Samraj	Front Office Management, Food and Beverage Service and Operations
2	Shaik Dariyavalli	Food and Beverage Production
3	Shailesh dewan	Hotel Law, Vocational Practical
4	Jagdish T	
5	Suchitra Raju	

All TDU B.Voc programs include general education courses that are common across programs. Following are the courses that were taught during AY2023-24 to all the students from Indian Culinary Academy.

Sl. No	Topic	Mysore	Bangalore
Sem 1	Health and Wellness I	Pallavi MD	Spoorthy Rao
Sem 1	Communicating in English – I	K Selvaraj	Thomas
Sem 2	Health and Wellness II	Mandara Shetty	Spoorthy Rao
Sem 2	POSH (Compulsory, Non-credit)	Online – Wadhwani Foundation	Online – Wadhwani Foundation

Other general education courses that were offered to these students during AY 2024-25, depending on their progression in our programs, include digital literacy, financial literacy, employability skills, work place skills and more.

Regarding report on Academic programs implemented by the: Education Innovation Team- Panchakarma

Report of work done during the year 2024:

The team in involved in developing & conducting Innovative educational programs that have Industry / End user driven and non-mainstream programs. In the year 2024, the team was involved mainly focused of delivering Knowledge & Skills of panchakarma therapy & therapist training programs.

1. Panchakarma Therapy & Yoga Basics, 6-months residential therapist training program
2. Diploma in Panchakarma Therapy & Nursing Aid

Around 180 students were enrolled and completed the training with 100% post training placements.

Sl. No	Title of research/outreach/ projects implemented during 2024-25	Source of funding	Team members associated with each project
1	Panchakarma Therapy & Yoga Basics, 6-months residential therapist training program	OSDA	Dr. Girish Kumar V Dr. Akshatha Dr. Nidhi Kanwar Dr. Vyshnavi Kini Dr. Keerthi Kulkarni Ms. Shalini V Ms. Harsha K Mr. Bhuban Mohan Behera
2	Diploma in Panchakarma Therapy & Nursing Aid	Scholarship + Self-funding	Dr. Girish Kumar V Dr. Nidhi Kanwar Dr. Vyshnavi Kini Dr. Akshatha Dr. Keerthi Kulkarni Ms. Shalini V

No of students: 180

Sl.No	Title of program	Students enrolled
1.	Panchakarma Therapy & Yoga Basics, 6-months residential therapist training program	168
2.	Diploma in Panchakarma Therapy & Nursing Aid	12

Goals of program:

a. To provide Well trained, Skilled and Certified Medical & paramedical resources to the Ayurveda / Health sector/industry
b. To provide improvised training with hands-on skills on Ayurveda panchakarma therapies, nursing & patient care for youth across the country

Feedback of students:

The student feedback received from 79 students, highlights a generally positive perception of the Panchakarma Therapist Program, with specific strengths and areas for improvement noted across different aspects of the course.

a) Academic Sessions:
Theory Classes: Majority of students expressed overall satisfaction with the depth and clarity of theoretical instruction.
Practical Sessions: Students expressed higher ratings, indicating high hands-on engagement and usefulness in skill development.

b) Teaching Effectiveness:
Most students felt teachers explained concepts and procedures effectively, highlighting strong teaching performance.

c) Internship Experience (IAIM Hospital):
Rated highly, suggesting that students found the internship valuable and relevant. Indicates effective hospital coordination and practical exposure.

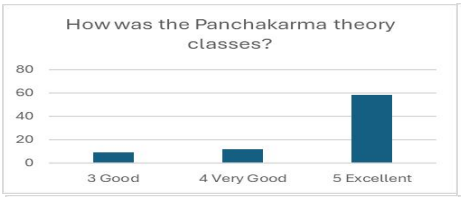
d) Infrastructure
Classroom and Practical Room Facilities: responses suggest rooms are adequately equipped.
Library Facilities: Well appreciated, indicating good availability and access to resources.

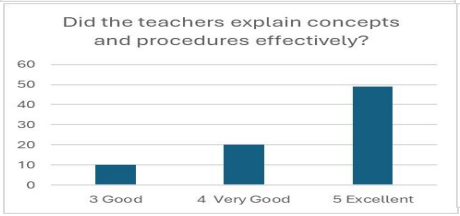
e) Hostel and Canteen Facilities
Hostel: Responses suggests need for improvements in comfort, hygiene, or maintenance.
Canteen Food Quality: Students expressed the need for hygiene and taste in food; this may require immediate/proper attention.

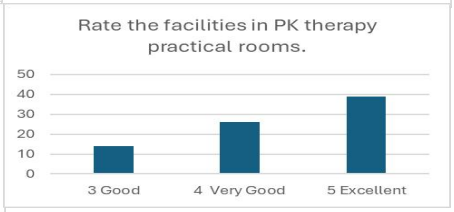
g) Placement Support
Student expressed stratification in placement support, suggested to strengthen placement coordination.

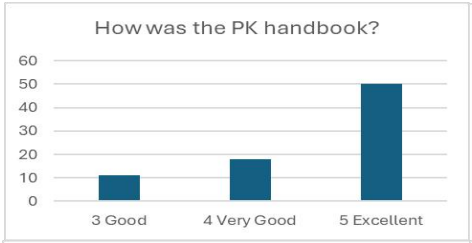
h) Overall Course Rating

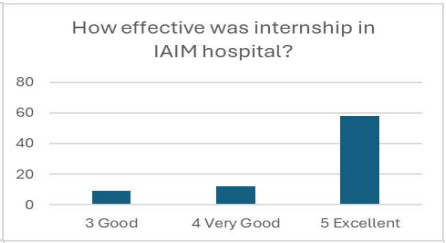
The course is well-received overall, with the majority rating it as “Very Good” or higher. Reflects satisfaction with curriculum, teaching, and practical exposure.

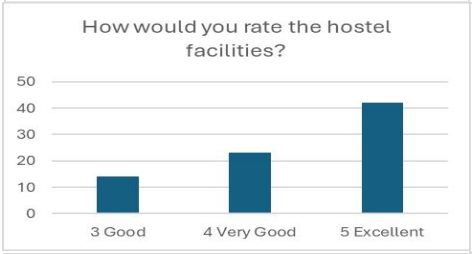


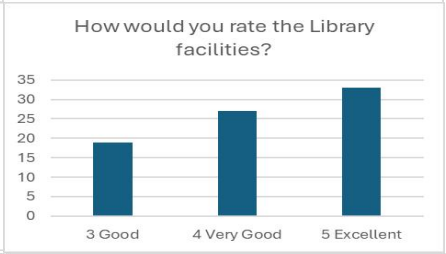


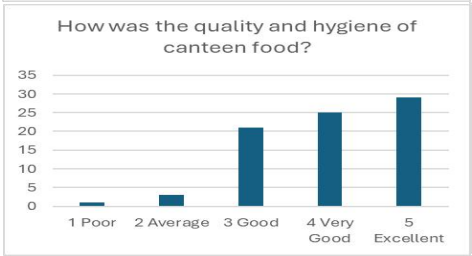


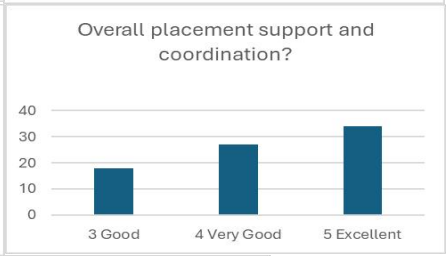


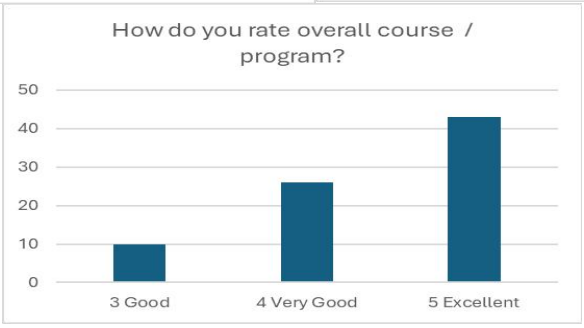












Photographs of teaching learning process

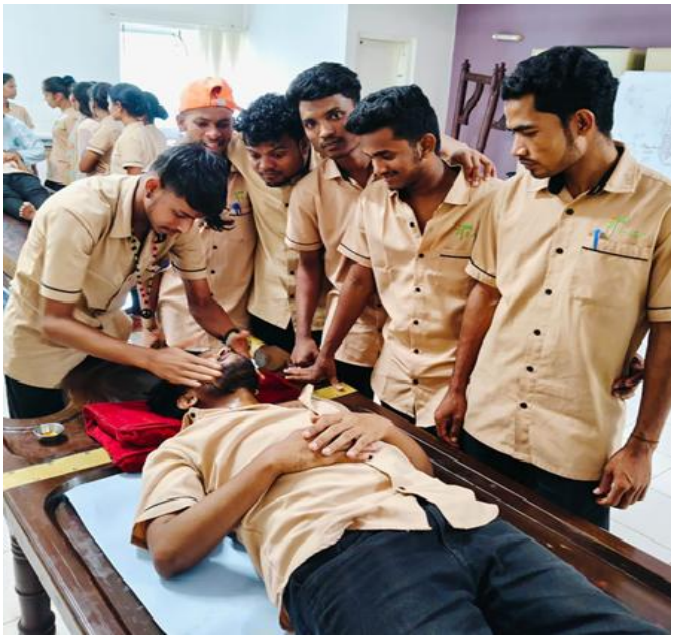


Figure 1. Students practicing skills of Mukha abhyanga & Nasya

Figure 2. Students practicing skills of Shirodhara

Figure 3. Students attending theory class at Patanjali block

Figure 4. Student experiencing Talapothichil a practice of panchakarma therapies

Figure 5. Students practicing Yoga Asanas

Figure 6. Student attending dravya guna classes in the Medicinal plant's nursery and garden as part of live plant identification skills

Table on faculty involved as per Table 2 below

Table 2: List of faculties involved in different Academic Programs

Sl. No	**Name of faculty**	**Topic (s) taught**
1.	Dr. Girish Kumar V	Dinacharya, Fundamentals Principles of Ayurveda, Dravya Guna
2.	Dr. Nidhi Kanwar	Fundamentals of Ayurveda, Soft Skills
3.	Dr. Vyshnavi Kini	Basic Anatomy and Physiology, Communications
4.	Dr. Akshatha	Basic Nursing Aid theory, Panchakarma theory
5.	Dr. Keerthi Kulkarni	Panchakarma theory, Panchakarma practical
6.	Ms. Shalini V	Dravya Guna, Bhaishajyakalpana, Panchakarma practical and Yoga Basics
7.	Ms.Harsha K	Panchakarma practical demonstration
8.	Mr. Bhuban Mohan Behera	Panchakarma practical demonstration

OTHERS

Other Information by Community Health

1. Invited Expert: Dr. Unnikrishnan Payyappalli was Invited as expert member in a meeting on Research Priority Settings for Traditional Medicine, jointly organized by CCRAS and WHO-GTMC, 24 June 2024, New Delhi

2. Invited talk: Dr. Unnikrishnan Payyappalli was Invited speaker at the symposium on Arogyasamskriti, held on June 10th, 2024, at Amrita Viswa Vidyapeethom, Amritapuri campus, Kerala.

3. Participation: Dr. Unnikrishnan Payyappalli participated in Workshop on Identification of IKS literature for inclusion in Science and Mathematics texts, NCERT, 27-28th August, New Delhi.

4. Invited talk: Dr. Unnikrishnan Payyappalli was Invited speaker at the Ayurveda Summit 2024: Integrating Evidence-Based Preventive Medicine into Healthcare Delivery Thursday 24th & 25 th October 2024, London.

5. Participation: Dr. Unnikrishnan Payyappalli participated Core committee meeting, International Research Institute for Ayureda (IRIA), Government of Kerala, Thiruvananthapuram, 28th November 2024.

6. Invited talk: Dr. Prakash BN gave a talk on "Role of Integrated Medicine and AYUSH in NCDs" in ‘Prerana’ The 3rd North East India Annual Diabetes Conference 20- 21 organised by Piramal Swasthya Management and Research Institute at Guwahati. on 21st February 2024.

Other Information by Ethno-veterinary Science and Practice

1. **Communications to Scientific Conferences** :M N Balakrishnan Nair and Punniamurthy N, 2024. Documentation, transdisciplinary validation and promotion of ethno veterinary medicine as an alternative to antibiotics and chemical veterinary drugs. **Breakout sessions Securing Livestock Production and Consumption.** 2024 Pacific Small Island Developing States Solutions Forum, Nadi, Fiji; from 5rd to 8th November, 2024.

Other Information by Conservation of Natural Resources

Awards and Grants (received by Ashutosh Sharma):

1. **International Association for Plant Taxonomy (IAPT)** research grant award 2024 (2000 dollars).

2. **ITS (International Travel Scheme) SERB (ANRF)** travel grant for attending XX International Botanical Congress (IBC) Madrid, Spain in July 2024.

3. **Dr. A.K. Pradeep Young Researcher Award** at XXXIV Annual Conference of the Indian Association for Angiosperm Taxonomy (IAAT) and International Seminar on "Botanical Symphony–Perspectives and Current Challenges in Angiosperm Systematics" (BSPCCAS 2024) held at Assam University from 23-25 November 2024.

Other Information by Ayurveda Biology and Holistic Nutrition

Achievements

1. Two best paper awards at 10th World Ayurveda Congress held at Dehradun (Ms. Sania Kouser and Mr. Abhi V Badiger).
2. Dr. Vishnuprasad was invited as speaker for the Ayurveda Biology Conclave of 10th World Ayurveda Congress.
3. Dr. Vishnuprasad was selected as member of MD Ayurveda Biology curriculum committee of NCISM.
4. Dr. Vishnuprasad invited as a panellist in the 1st International Conference on Advances in Integrative Medicine (AIM) 2025: *Ancient Inspiration, Modern Evidence* for the session 'Modern Advances in Ayurveda'.

Other Information by Food Futures and Holistic Nutrition - Some program highlights:

Anemia Program in Nilgiris

Training of healers and health workers on anemia – 1150 health workers have undergone training of which 67 have been given additional training for home visits which have

resulted in 5800 + families participating in the anemia program. These are across 219 tribal villages which is just over 50% of the total tribal villages (408) in Nilgiri's.

Ayurveda Dietetics Program
This is an 8-h online certificate program on Ayurveda Dietetics and targets nutritionists and dieticians. 1400 hundred professionals and students have attended this course over last 2 years.

Indian Culinary Science Workshops
This program is conducted as live demonstrations or workshops at TDU's Research Kitchen, probably the only such kitchen in an academic set-up in India. 3500 people from various backgrounds – medical doctors, Ayurveda physicians, chefs, dieticians, students, general public have attended this program which introduces the key culinary practices that transform food ingredients into healthy nutritious foods.

Functional Food Workshops
These workshops and demonstrations are conducted in TDU's kitchen and pilot plants. 10+ demonstrations have been conducted and 4 workshops on proteins have been conducted. Overall, participants from 100+ industries & institutes and attended these workshops over the last few years.

Smart Protein Symposiums
Two 2-day symposiums have been conducted on the area of alternative & smart proteins.

The first organised jointly with GFI & CoFTI was attended by 500+ participants (physical & online) and had 6 panel discussions and 15 talks by industry and academic and government leaders & experts.

The second was organised jointly with University of Greenwich and had a workshop component along with 10+ talks by experts and was attended by nearly 100 people. For the first time we had international speakers from Wageningen, Imperial College and University of Greenwich join the symposium, making it a international symposium.

Funding
Rural India Supporting Trust Continues to be the biggest supporter of the Food Futures and Holistic Nutrition Program. Their generous funding has enabled building the world class research infrastructure and capabilities that are getting global recognition for the program.

The program also raises funds through research projects for industry and startups. The names of our industry research sponsors are not disclosed due to privacy clauses in the agreements.

PUBLICATIONS

Publications from Community Health

1. Mammadova, A., Payyappallimana, U. and Badiger, S., 2024. Collaborative Educational Study on Traditional Medicine and Biodiversity Conservation within UNESCO Biosphere Reserve. *European Journal of Sustainable Development*, *13*(4), pp.458-458.
2. Ravindran, V., Kumar, K., Bhandari, S., Chattopadhyay, K., Payyappallimana, U., Morandi, A. and Gupta, R., 2024. Can Ayurveda medicine supplement modern medical treatments in chronic disease management?. *Journal of the Royal College of Physicians of Edinburgh*, *54*(3), pp.270-271.
3. Sekagya, Y.H., Muchunguzi, C., Unnikrishnan, P. and Mulogo, E.M., 2024. An exploratory study on becoming a traditional spiritual healer among Baganda in Central Uganda. *PLOS Global Public Health*, *4*(4), p.e0002581.
4. Sekagya, Y.H., Muchunguzi, C., Unnikrishnan, P. and Mulogo, E.M., 2024. Perspectives on health, illness, disease and management approaches among Baganda traditional spiritual healers in Central Uganda. *PLOS Global Public Health*, *4*(9), p.e0002453.
5. Sekagya, Y.H., Muchunguzi, C., Unnikrishnan, P. and Mulogo, E.M., 2024. A grounded theory study of beliefs underlying use of ancestral spirits for healing among Baganda traditional spiritual healers in Central Uganda. *medRxiv*, pp.2024-04.

Publications from Ethno-veterinary Science and Practice

1. **MN Balakrishnan Nair**. 2024. Field study on the efficacy of ethno-veterinary herbal spray for ectoparasites. *The Pharma Innovation Journal* 2024; 13(12): 175-177
2. **Nair, M. N. B**., Bhatt, J. B., Paradva, B. R., Fursule, A., Raturi, P. P., & Verma, R. (2024). Sustainable Tapping of Commiphora wightii (Arnott) Bhandari. *European Journal of Applied Sciences*, *12*(5), 327–338. https://doi.org/10.14738/aivp.125.17706
3. **Balakrishnan M N Nair** and Punniamurthy N**.** 2024.Management of Mastitis using trans-disciplinarily validated Ethno-veterinary Practice. In Recent Developments on Bovine Mastitis treatment and control. Edt. Kiro Petrovski. Intech open series veterinary medicine and science, volume 19. Intech open, London UK, Pages 3-16.
4. **M N Balakrishnan Nair**, Manjunatha P Mudagal, Suresh Janadri, 2024. Dermal toxicity study of test drug “herbal spray for ectoparasites” on rat for safety profile, International Journal of Research and Analytical Reviews (IJRAR) April 2024, Volume 11, (2) 781-789
5. P. K. Kothapalli, S. Nagaraj , S. M. Pubbineedi , **M. N. B. Nair** , P. Natesan and G. B. M. Reddy 2024. Mycotoxin deoxynivalenol (DON) increases replication of the lumpy skin disease virus in MDBK cells, Indian Journal of Animal Health, DOI: https://doi.org/10.36062/ijah.2024.16323

Publications from Conservation of Natural Resources

1. Handbook on Makalidurga forest important species was published.
2. Handbook EVP recipes and project report was prepared
3. Srushti vijayakumar, Harshavardhan M, Dhatchnamoorthy, Noorunnisa Begum, Jyothi Uppar, S Jyothsna B. 2924, Ethnobotanical Study in Chinthamani Taluku International Journal of Progressive Research In Science And Engineering, Vol.5, No.8., August 2024.
4. Xylem of Dashamoola Nusra Naseer L, Yashwant K, Patturaj R, Noorunnisa Begum S, Srinivasulu MV and Jyothsna BS. 2024. Journal of Pharmacognosy and Phytochemistry, ; 13(4): 300-304, DOI: https://doi.org/10.22271/phyto.2024.v13.i4d.15021
5. **Devanathan, K & Dhatchanamoorthy**, N. (2025) Reevaluating the infraspecific taxa of *Maesa rugosa* C.B. Clarke (Primulaceae): Taxonomic reassessment and typification update. *Phytotaxa* 683 (1): 053–062.
6. Devanathan, K **& Dhatchanamoorthy, N.** (2024) A new name *Maesa sleumeri* for *Maesa lineolata* Sleumer and lectotypification of *Maesa lineolata* H.R. Fletcher (Primulaceae). *Phytotaxa* 665 (2): 174–177.
7. Devanathan, K & **Dhatchanamoorthy, N.** (2024) Typification of three names in the genera *Plectranthus* and *Coleus* (Lamiaceae). *Phytotaxa* 660 (1): 081–087.
8. **Sharma, A.**, Adamowski, W., Naithani, H.B. & **Begum, S.N.** (2024) Rediscovery of rare steno-endemic *Impatiens violoides* Edgew. ex Hook.f. (Balsaminaceae) from Western Himalaya after 179 years of type collection. *Phytotaxa.* 644 (1): 042–048. DOI: https://doi.org/10.11646/phytotaxa.644.1.6

Conference Papers:

1. **Sharma, A.**, **Begum, S**.N. & Ravikumar, K. (2024) Unveiling the enigmatic world of Western Himalayan *Impatiens*: Exploring species diversity and endemism. Presented at XXXIV Annual Conference of the Indian Association for Angiosperm Taxonomy (IAAT) cum International Seminar on "Botanical Symphony–Perspectives and Current Challenges in Angiosperm Systematics" (BSPCCAS 2024) held at Assam University Silchar, 23-25 November 2024.

2. **Sharma, A.**, Adamowski, W., **Begum, S.N.** & Ravikumar, K. (2024) Unveiling the enigmatic world of *Impatiens* of Western Himalayas: Exploring diversity, endemism and habitat preferences. Presented at XX International Botanical Congress (IBC), Madrid, Spain, 21-27 July 2024.

Chapters published:

1. S. Noorunnisa Begum, R. Patturaj and K. Ravikumar. 2024. Trade and Commerce of Gum Karaya in T. Pullaiah, Niranjan Prasad, L. Md. Bhakshu, Mallappa Kumara Swamy (eds.). 2024. Gum Karaya - Botany, Gum Tapping, Applications, and Biotechnology. CRC Press.

2. R. Patturaj, S. Noorunnisa Begum and K. Ravikumar. 2024. Gum Karaya and Peoples Livelihood in T. Pullaiah, Niranjan Prasad, L. Md. Bhakshu, Mallappa Kumara Swamy (eds.). 2024. Gum Karaya - Botany, Gum Tapping, Applications, and Biotechnology. CRC Press.

Publications by: Vocational Education Cell (VEC)

1. Banerjee S, Nayak D and **Sinha A.** 2024. Adivasi (Tea Tribe) worldviews of living close to wild Asian elephants in Assam, India. *Conservation Biology*, 38, e14397
2. Dhawale A K and **Sinha A**. 2024. Twinning in wild, endangered, lion-tailed macaques *Macaca silenus* in the Anamalai hills of the Western Ghats, India. *Primates*, 65, 229-234
3. **Mistry V** and Vargiya D. 2024. Sightings of Pacific golden plovers *Pluvialis fulva* from Anand and Kheda districts of Gujarat. *Flamingo*, 7(4), 15
4. **Mistry V** and Vasava A. 2024. Short Birding Notes – Sighting of leucistic little ringed plover Charadrius dubius in Anand district. *Flamingo*, 7(4), 17
5. Patel H, Patel A, **Mistry V** and Vyas R. 2024. On the climbing ability of two pitless vipers (Squamata: Serpentes: Viperidae) from India. *SAURIA*, 46(2), 37-42
6. Si A, **Agnihotri S** and Madegowda C. 2024. Age and gender-related variation in plant and animal naming ability in the Soliga/Solega community of southern Karnataka, India. *Human Ecology*, 52, 1035-1047
7. **Thapa A**, Mukherjee T, Pradhan A and Chattopadhyay J. 2024. Understanding the prospects of human–wildlife coexistence: A conceptual framework. *Biodiversity and Conservation*, 33(13), 3583-3615
8. Vyas R, Chauhan N and **Mistry V**. 2024. Aberrant colouration in Russell's Viper *Daboia russelii* (Shaw & Nodder, 1797) from Anand, Gujarat, India. *SAURIA*, 46(1), 65-68
9. Vyas R, Vasava A and **Mistry V**. 2024. Several mugger crocodiles burn and die in wetland fire. *CSG Newsletter, Crocodile Specialist Group of the Species Survival Commission (SSC) of the IUCN (International Union for Conservation of Nature)*. Volume 43 (3), 17

Publications by Ayurveda Neurobiology

1. Small organism models for mode of action research on anti- ageing and nootropic herbs, foods and formulations.
   Anjaneyulu J and Godbole A. Nutritional neuroscience. 21:1-19, Oct 2024,

   DOI: https://doi.org/10.1080/1028415X.2024.2409128.

2. Gray Matter Reduction in Hippocampal Subfields and associated auditory verbal learning and memory Decline with Ageing. Mukesh Kumar, Arman Deep Singh, Bhargavi P, Swathi BH, Subash Khushu and Ashwini Godbole.
   https://submissions.mirasmart.com/ISMRM2025/Itinerary/ConferenceMatrixEventDetail.aspx?id=450

3. Impact of Ageing on Regional Cortical Thickness and Its Relationship with Cognitive Abilities. Arman Deep Singh, Mukesh Kumar, Bhargavi P, Swathi BH, Subash Khushu and Ashwini Godbole.
   https://submissions.mirasmart.com/ISMRM2025/Itinerary/ConferenceMatrixEventDetail.aspx?id=445

4. Effect of Ayurvedic formulation on metabolic profile of posterior cingulate cortex in ageing population. Arman Deep Singh, Mukesh Kumar, Bhargavi P, Swathi BH, Subash Khushu and Ashwini Godbole. https://submissions.mirasmart.com/ISMRM2025/Itinerary/ConferenceMatrixEventDetail.aspx?id=450

Publications by Ayurveda Biology and Holistic Nutrition

1. Surendran H, Battu R, Gopurappilly R, Vishnuprasad CN, Pal R. Generation of a human induced pluripotent stem cell (iPSC) line ERPLi004-A from an Alpha-1 antitrypsin deficiency (AATD) patient with SERPINA1 mutation. Stem Cell Res. 2025 Mar;83:103664. doi: 10.1016/j.scr.2025.103664. Epub 2025 Jan 25. PMID: 39884160.
2. Deevi SK, Anilkumar B, Pinto PG, Ramani P, Vishnuprasad CN, Shanmugaraju S and Pandurangan N (2024). Facile synthesis of corticiolic acid—a bioactive pharmacophore from natural sources. *RSC Adv.*, 2024, 14, 37539-37545. doi: 10.1039/D4RA06585A
3. Mammadova, A., Payyappallimana, U, Vishnuprasad CN, & Badiger, S. (2024). Collaborative Educational Study on Traditional Medicine and Biodiversity Conservation within UNESCO Biosphere Reserve. *European Journal of Sustainable Development*, *13*(4), 458. https://doi.org/10.14207/ejsd.2024.v13n4p458

4. Sruthi G, Megha, In pursuit of evidence: A need to transform Ayurvedic education, Journal of Ayurveda and Integrative Medicine, Volume 16, Issue 2, 2025, https://doi.org/10.1016/j.jaim.2024.101110.

Publications by Traditional Knowledge, Data Sciences and Informatics

Report: Ayurveda – Pharmacology of Medicinal Plants, Center for Traditional Knowledge and Informatics. Authors: Kukkupuni SK, Fathima TS and Nair SV, Submitted to the IKS Division, Ministry of Education, GOI.

Publications by Food Futures and Holistic Nutrition

1. Deepshikha Kataria, Gurmeet Singh, Effect of processing methods on fatty acid composition and flavour profile of clarified butter (ghee) obtained from Deoni and Holstein Friesian cow breeds, Food Chemistry: X, Volume 27, 2025, 102489, ISSN 2590-1575, https://doi.org/10.1016/j.fochx.2025.102489.

2. Hegde SN, K LD, Choudhary M, Menon N, Singh G. A comprehensive metabolome profiling of Terminalia chebula, Terminalia bellerica, and Phyllanthus emblica to explore the medicinal potential of Triphala. Nature Scientific Reports. 2024 Dec 30;14(1):31635. doi: 10.1038/s41598-024-80544-6. PMID: 39738152; PMCID: PMC11685403.

3. Dey D., Singh G., Ishwarya P., Mateen A., Functionality and Extrusion Processing of Millets - A Review. Food Reviews International, 2024, 40(10):1-29

4. Kataria, D., & Singh, G. (2024). Health benefits of ghee: Review of Ayurveda and modern science perspectives. Journal of Ayurveda and integrative medicine, 15(1), 100819. https://doi.org/10.1016/j.jaim.2023.100819

Patents

Iron rich green leaf powder	May 2024	Filed, to be published
Millet and protein based extruded food	July 2024	Filed, to be published
Coarse grain flours with high extensibility doughs	Oct 2024	Filed, to be published
Natural iron rich snack	Jan 2025	Filed, to be published

Invited Talks

1. **Diet and Health:** Leads from Traditional Knowledge Systems - Invited Talk at FICCI Symposium of HFFS, Federation House Delhi, February 2025
2. Indian Culinary Science: The Traditional Food Ingredients, Cooking Principles and Practices and their Translation Into Functional Foods Addressing Today's Public Health Challenges @ Functional Ingredients in Indian Traditional / Indigenous Products- Safety, Benefits and Way Forward ILSI, September 2024
3. Infusions of Goodness: Intercropping Botanicals and Tea @UPASI Annual Tea Planters Meeting, Coonoor, September 2024
4. Traditional Knowledge for Sustainable Livelihoods - Opportunities and Challenges For Food-based Social Entrepreneurship, @ STI Conclave on Traditional Knowledge for Sustainable Livelihood, CSIR Science Centre, New Delhi August 2024
5. Indian Culinary Science - Translating Traditional Knowledge Into Innovations to Address Public Health Challenges @Science Forum, Christ University, Bangalore, August 2024
6. Novel technologies for fortification of staples – creating protein enriched rice kernels and daal analogues, Symposium on Technological Advancements in Staple Food Fortification (FortiSF2024), Indian Institute of Technology, Khargapur, Feb 2024
7. Relevance of Traditional Foods in Preventing NCDs, National Conference on Diabetes Prevention, National Health Mission, Guwahati, Feb 2024
8. Intercropping of Medicinal Plants in Plantations, Webinar organized by United Planters Association of South India, Feb 2024.

2024

The University of Trans-Disciplinary Health Sciences and Technology

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