

9th August 2017 (Day 7)

Time	Session title
09.00 – 10.30	Theory – <i>In vitro</i> flowering Seeni S.
10.30 – 11.00	Tea Break
11.00 – 12.30	Applications of <i>In vitro</i> flowering in crop improvement Seeni S.
12.30 – 01.30	Lunch Break
01.30 – 03.00	Practical – <i>In vitro</i> flowering Biju Dharmapalan
03.00 – 03.30	Tea Break
03.30 – 04.45	Practical – <i>In vitro</i> flowering Biju Dharmapalan

10th August 2017 (Day 8)

Time	Session title
09.00 – 10.30	Theory – Protoplast culture K. K. Sabu, TBGRI
10.30 – 11.00	Tea Break
11.00 – 12.30	Somatic hybridization K. K. Sabu, TBGRI
12.30 – 01.30	Lunch Break
01.30 – 03.00	Practical – Protoplast isolation and culture Biju Dharmapalan
03.00 – 03.30	Tea Break
03.30 – 04.45	Practical – Protoplast isolation and culture Biju Dharmapalan

11th August 2017 (Day 9)

Time	Session title
09.00 – 10.30	Theory – <i>In vitro</i> germplasm conservation William Decruz, TBGRI
10.30 – 11.00	Tea Break
11.00 – 12.30	Cryopreservation William Decruz, TBGRI

12.30 – 01.30	Lunch Break
01.30 – 03.00	Practical – Agrobacterium mediated transformation Blessan Santhosh George
03.00 – 03.30	Tea Break
03.30 – 04.45	Practical – Agrobacterium mediated transformation Blessan Santhosh George

12th August 2017 (Day 10)

Time	Session title
09.00 – 10.30	Theory – Low Cost Tissue Culture Technic Hemanth Kumar, TBGRI
10.30 – 11.00	Tea Break
11.00 – 12.30	Issues in Commercial Tissue Culture of Floriculture and Horticultural Plants Hemanth Kumar, TBGRI
12.30 – 01.30	Lunch Break
01.30 – 03.00	Practical – Screening techniques for transgenics Blessan Santhosh George
03.00 – 03.30	Tea Break
03.30 – 04.45	Practical – Screening techniques for transgenics Blessan Santhosh George

For Registration
Biju Dharmapalan
Co-ordinator

Hands-on training on Plant Tissue Culture techniques and Applications
School of Biosciences,
MACFAST, Kerala-689101
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Greeshma Designs. Kim.

Hands-on training on Plant Tissue Culture techniques and Applications

02nd to 12th August 2017



Sponsored by



School of Biosciences
Mar Athanasios College for
Advanced Studies Tiruvalla,
Kerala-689101
www.macfast.org

The School of Biosciences MACFAST (Mar Athanasios College for Advanced Studies Tiruvalla) is organizing a Hands-on training programme in Plant Tissue Culture techniques sponsored by Kerala Biotechnology Commission from 2nd to 12th August 2017. Technical sessions will be handled by scientists from RGCB, Thiruvananthapuram, JNTBGRI, Palode and MACFAST. The programme is primarily meant for students and unemployed youth. Registration for the training programme is free and participation is limited to 30 members. Those interested in attending the workshop should send an email to the programme co-ordinator.

Rev.Fr.Pradeep Vazhatharamalayil
Principal

PROGRAMME SCHEDULE

2nd August 2017 (Day 1)

Time	Session title
09.00 – 10.30	Theory – Introduction to Plant Tissue Culture Biju Dharmapalan
10.30 – 11.00	Tea Break
11.00 – 12.30	Theory – Media components, their role and significance Biju Dharmapalan
12.30 – 01.30	Lunch Break
01.30 – 03.00	Practical I – Media preparation Biju Dharmapalan
03.00 – 03.30	Tea Break
03.30 – 04.45	Practical I – Media preparation Biju Dharmapalan

3rd August 2017 (Day 2)

Time	Session title
09.00 – 10.30	Theory – Micropropagation Biju Dharmapalan
10.30 – 11.00	Tea Break
11.00 – 12.30	Theory – Micropropagation of Banana Seeni S.
12.30 – 01.30	Lunch Break
01.30 – 03.00	Practical – Micropropagation Biju Dharmapalan
03.00 – 03.30	Tea Break
03.30 – 04.45	Practical – Micropropagation Biju Dharmapalan

4th August (Day 3)

Time	Session title
09.30 – 10.30	Theory – Haploid Production Arun K. Das
10.30 – 11.00	Tea Break
11.00 – 12.30	Applications of haploids in agriculture and biotechnology Arun K. Das
12.30 – 01.30	Lunch Break
01.30 – 03.00	Practical – Anther Culture Biju Dharmapalan
03.00 – 03.30	Tea Break
03.30 – 04.45	Practical – Anther Culture Biju Dharmapalan

5th August 2017 (Day 4)

Time	Session title
09.00 – 10.30	Theory – Plant Secondary Metabolites and their Importance Sreekumar S. JNTBRI
10.30 – 11.00	Tea Break
11.00 – 12.30	In vitro synthesis of Plant Secondary Metabolites Sreekumar S. JNTBRI

12.30 – 01.30	Lunch Break
01.30 – 03.00	Practical – Suspension Culture Arun K. Das
03.00 – 03.30	Tea Break
03.30 – 04.45	Practical – Suspension Culture Arun K. Das

7th August (Day 5)

Time	Session title
09.00 – 10.30	Theory – Organogenesis and embryogenesis T. S. Preetha, University College, Trivandrum
10.30 – 11.00	Tea Break
11.00 – 12.30	Applications of Synthetic seeds T. S. Preetha, University College, Trivandrum
12.30 – 01.30	Lunch Break
01.30 – 03.00	Practical – Synthetic Seeds Biju Dharmapalan
03.00 – 03.30	Tea Break
03.30 – 04.45	Practical – Synthetic seeds Biju Dharmapalan

8th August 2017 (Day 6)

Time	Session title
09.00 – 10.30	Theory – Basics in Transgenic Technology E. V. Soniya, RGCB
10.30 – 11.00	Tea Break
11.00 – 12.30	Transgenics in agribiotechnology E. V. Soniya, RGCB
12.30 – 01.30	Lunch Break
01.30 – 03.00	Practical – DNA Isolation Blessan Santhosh George
03.00 – 03.30	Tea Break
03.30 – 04.45	Practical – DNA Isolation Blessan Santhosh George



Workshop on “Plant Tissue Culture techniques and Applications”

Thiruvalla:

12th August 2017

The School of Biosciences MACFAST (Mar Athanasios College for Advanced Studies Thiruvalla) had organised a 10 day hands on training programme on *Plant Tissue Culture techniques and Applications* in collaboration with Kerala Biotechnology Commission. The hands on training is organised from 2nd to 12th August 2017. The technical sessions were handled by eminent scientists from RGCB, Thiruvananthapuram, JNTBGRI, Palode and MACFAST. The aim of the programme was to attract students and unemployed youth to the promising area of Tissue Culture. The registration was free and the participants were limited to 30 members. The programme started with the formal inauguration by Fr. Pradeep Vazhatharamalayil, Principal MACFAST. The programme in Day 1 was handled by Mr. Biju Dharmapalan. In the 2nd day, Dr. Seeni S joined along with Prof. Biju Dharmapalan to talk on the theory of Micro propagation. On 4th August Dr. Arun K. Das introduced the topic of Haploid Production along with Anther Culture by Mr. Biju Dharmapalan. Sreekumar S. of JNTBRI handled the theory on Plant Secondary Metabolites and their importance on Day 4. The Practical on Suspension Culture was taken by Dr. Arun K. Das. On 7th August, Theory of Organogenesis and embryogenesis was introduced by T.S. Preetha, University College Trivandrum. The Practical session on Synthetic Seeds tissue culture was handled on the 5th day by Prof. Biju Dharmapalan. The day 6 started with the session on the Transgenics in agribiotechnology by E.V Soniya, RGCB. The practical session on DNA Isolation was delivered by Mr. Blessan Santhosh George, MACFAST. In vitro flowering was the topic of flowers on Day 7 - 9th August 2017, which was



handled by Dr. Seeni S; practical sessions were handled by Mr. Biju Dharmapalan. On 10th August 2017, Protoplast culture was the topic of workshop by K. K. Sabu, TBGRI. The practical for the same was handled by Mr. Biju Dharmapalan. The 9th day started with the class on In vitro germplasm conservation by William Decruz, TBGRI. Cyropreservation and the practical sessions followed on the same date. In the final day Low Cost Tissue Culture Technique was handled by Mr. Hemanth Kumar, TBGRI. There were also sessions on Issues in Commercial Tissue Culture handled by Mr. Hemanth Kumar, TBGRI. Mr. Blessan Santhosh George handled the practical session on screening techniques for transgenics. A total of 55 participants attended the workshop and the registration was handled by Mr. Biju Dharmapalan.

Handwritten signature: Holy Spirit

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Fr. Dr. CHERIAN J KOTTAYIL
PRINCIPAL
Mar Athanasios College For Advanced Studies
Truvalla- 689101, Kerala



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Co-ordinator

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Dr. K K Sabu

Senior Scientist

Biotechnology & Bioinformatics Division

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Research details

Dr. Sabu is educated in the field of Plant Sciences and has working experience in plant genetics, biotechnology and bioinformatics since 1995. He published several research articles in national/international journals. He has currently supervising five graduate students for their PhD programme and carrying out three externally funded research programmes.

Major Research Activities

- Analysis of genetic diversity and phylogeny in Calamus L. (Arecaceae)
- Analysis of genetic variability, association mapping and microRNA diversity of wild cardamom populations
- Estimation of genetic diversity in Centella asiatica and regulation of secondary metabolite production using miRNAs

R & D projects

Ongoing

- **Project Title:** Community plant-pollinator interactions at the landscape level.
Name of the PI & Co-PI(s): Dr. B. Sabulal, Dr. Mathew Dan, and Dr. K. K. Sabu (JNTBGRI); Mr. Deepak Mundkinajeddu (M/s Natural Remedies Pvt Ltd, Bangalore).
Funding agency and amount sanctioned: Department of Biotechnology, Government of India. 36.31 Lakhs.
Project period and date of commencement: 3 years from 14.05.2015.

Project Title: Identification of elite lines of Centella asiatica and Bacopa monnieri for commercially significant constituents for standardization of their extracts
Name of the PI & Co-PI(s): Dr. A. K. Sreekala, Dr. C. Anilkumar and Dr. K. K. Sabu (JNTBGRI); Dr. Hema Somanathan (IISER, Trivandrum), Dr. Deepak Barua (IISER, Pune), Prof. V. V. Belavadi (GKVK, Bangalore)
Funding agency and amount sanctioned: Department of Biotechnology, Government of India. 59.23 Lakhs.
Project period and date of commencement: 3 years from 14.05.2015

Project Title: Analysis of genetic variability and bioprospecting of wild cardamom populations.
Name of the PI & Co-PI(s): Dr. K. K. Sabu.
Funding agency and amount sanctioned: KSCSTE Plan (In-house). 24.84 lakhs (fund received till 4th year).
Project period and date of commencement: 5 year programme started in April 2012.

Completed

- **Project Title:** Assessment of Genetic Diversity and Identification of Gender Specific Markers of Important North-East and South Indian Rattan palms using SSR Analysis.
Name of the PI & Co-PI(s): Dr. K.K. Sabu & Dr. A.S. Hemanthakumar.
Funding agency and amount sanctioned: Department of Biotechnology, Government of India. 16.35 Lakhs.
Project period and date of commencement: Nov 2011 to Nov 2014

Project Title: Analysis of genetic diversity in selected rattan palms (*Calamus* sp.) using microsatellite markers.

Name of the PI & Co-PI(s): Dr. K.K. Sabu.

Funding agency and amount sanctioned: Kerala Biotechnology Commission, KSCSTE, Fund received: 10.34 lakhs.

Project period and date of commencement: April 2012 to March 2014.

Major Achievements

- Organized a germplasm collection of *Andrographis paniculata* from South East Asia and analyzed intraspecific variations of the species.
- Six new rice varieties were developed and registered under PROTECTION OF NEW PLANT VARIETIES ACT 2004 in Malaysia in association with other researchers.
- Developed mapping population of rice and conducted molecular breeding.
- Genome size of cardamom was determined for the first time.
- Micro RNA and transcriptome sequencing cardamom was carried out for the first time.

Publications

1. Lakshmi Priya, P. M. and K. Sabu. 2015. *In Silico* Analysis of Transcriptomes of *Catharanthus roseus* and *Rauvolfia serpentina*, two potent medicinal plants using a pipeline developed from publicly available tools. *American Journal of Bioinformatics Research* 5(2) (Accepted).
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3. Alireza Valdiani, Daryush Talei, Surrinder K. Lattoo, Jacqueline Batley, Rodomiro Ortiz, Mohd Yusop, Rafii, Mahmood Maziah, K. Sabu, Rambod Abiri, Suchirat Sakuanrungsirikul, Soon Guan Tan. 2015. Biotechnological and Conventional Advances of Plant Breeding in *Andrographis paniculata*: A Promising Breeding Platform for Autogamous Medicinal Plants. *Critical Reviews in Biotechnology* (Accepted).
4. Princy, P. S., A. Gangaprasad and K. Sabu. 2015. *In Vitro* Propagation and Evaluation of Genetic Fidelity of *Aegle marmelos* (L.) Correa, a Highly Sought After Sacred Medicinal Tree. *Phytomorphology* 65 (1&2): 1-10.
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 10. Sabu K.K., Abdullah M.Z., Lim L.S. and Wickneswari R. 2009. Analysis of heritability and environmental variances in a rice cross. *Agronomy Research* 7: 97-102.
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 12. Sabu, K.K., Padmesh and S. Seenii. 2001. Estimation of active principle content and isozymes of *Andrographis paniculata*, an important medicinal plant of India. *Journal of Medicinal & Aromatic Plant Sciences* 23: 637-647.
 13. Jacob, J.P., K.K. Sabu and T.K. Abraham. 2000. Genetic variability of mutant strains of *Pleurotus citrinopileatus* based on isozyme electrophoresis. *Mushroom Research* 9: 79-84.
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Books/Book Chapters/Thesis

- Sabu, K. K., Nadiya. F., and N. Anjali. 2016. miRNA isolation from plants rich in polysaccharides and polyphenols. In: *Micro RNA Profiling: Methods and Protocols*. Sweta Rani (Ed). Springer, New York. (Accepted)
- Harinarayanan, P. & Sabu, K. K., (Eds.). 2009. *Proceedings of National Seminar on Coastal Ecosystem Management & Evaluation Workshop of South Indian ENVIS Centres*. ENVIS Centre, Kerala State Council for Science, Technology, & Environment, Thiruvananthapuram. 126 pages.
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- KK Sabu. 2002. *Intraspecific variations in Andrographis paniculata* Nees (PhD Thesis). Kerala University, Thiruvananthapuram, India
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Conference Papers

- Binoy Kurian, Vishnu V. Nair, and K.K. Sabu. 2015. Paucity of genetic diversity in an important non-wood forest produce: *Calamus brandisii* Becc. – A dwindling species? Proceedings of the 27th Kerala Science Congress held at Alappuzha during 27th – 29th January 2015.

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Sabu K.K., Abdullah M.Z., Lim L.S. and Wickneswari R. 2005. Heritability and genetic variance estimates for yield and yield related traits in *Oryza rufipogon*/*O. sativa* F₁ and BC₂F₂ families. 5th International Rice Genetics Congress held at International Rice Research Institute (IRRI), Manila in November 2005.

Lim, L.S., K.K. Sabu, R. Wickneswari and M.Z. Abdullah. 2005. Identification of QTLs for tillering ability in an inter-specific rice cross. *Plant & Animal Genomes XIII Conference*, January 15-19, 2005. Town & Country Convention Center, San Diego, USA.

Sabu, K.K. 2005. Using SAS Procedures to Estimate Genetic Variances and Heritability in a Rice Cross. Proc. of 19th Annual SAS User's Malaysia (SUM) Forum, Kuala Lumpur Convention Centre. 21 Sept 2005.

Geetha, B.S., K.K. Sabu and S. Seeni. 2003. Genetic variation in south Indian populations of *Phyllanthus amarus* Schum. & Thonn. (Euphorbiaceae) assessed using isozymes. Proceedings of the 15th Kerala Science Congress. 29-31 January 2003, Thiruvananthapuram, pp. 196-201.

Nadarajah, K., Song, B.K., Sabu, K.K. and Ratnam, W. 2003. The Use of microsatellite markers in physical and genetic mapping of Malaysian rice variety. *International Conference for Bioinformatics*, Penang Malaysia. Pg 111 (D003).

Lim L.S, Sabu K.K., Wickneswari R. and Abdullah M.Z. 2003. QTL identification of yield-related traits in a Malaysian rice cross. *Int Rice Conference*, 13-17 Oct 2003, Alor Setar, Malaysia

Wickneswari R., Lim L.S., Sabu K.K. and Abdullah M.Z. 2003. Improvement of grain yield using AB-QTL strategy in a Malaysian rice variety. Oral paper presented at the 14th National Biotechnology Seminar, 11-13 December 2003, Penang, Malaysia.

Wickneswari R., Sabu K.K., Lim L.S and Abdullah M.Z. 2003 Improvement of grain yield using advanced backcross QTL strategy in a Malaysian rice variety. *International Genetics Congress*, 6-11 Jul 2003, Melbourne, Australia.

Sabu, K.K. and Seeni, S. 2003. *In situ* and *ex situ* genetic diversity of *Andrographis paniculata* Nees populations from India. *Int Genetics Congress 2003*, 6-11 Jul 2003, Melbourne, Australia

Sabu, K.K. and S Seeni. 2001. PlantPack: a new software for analysis of diversity within *Andrographis paniculata*, an important medicinal plant, In: Proc. Kerala Science Congress (13th), January 2001, Thrissur pp. 688-690.

Sabu, K.K., S Seeni and G Sreekantan Nair. 2001. The application of Bioinformatics in bioprospecting of medicinal plant resources of Kerala. In: Proc. 13th Kerala Science Congress, January 2001, Thrissur. Theme Session: information Technology for Development - A Millennium Perspective, pp. 46-50.

Padmesh P., K.K. Sabu and S. Seeni. 1999. Analysis of genetic variations in *Andrographis paniculata* using isozyme and random amplified polymorphic DNA markers. Proc 11th Kerala Science Congress, 27 Feb.-1 Mar. 1999, Kasaragod- (India), pp. 95-100

Sabu, K.K. and S. Seeni. 1999. Development of a computer package for estimation of various plant molecules. *Symposium on Current Trends in Biology*, Indian Institute of Science, Bangalore. 27-28 Dec, 1999.

Sabu, K.K. and S. Seeni. 1998. Patterns of allozyme diversity in natural populations of *Andrographis paniculata* Nees. National Conference on Recent Trends in Spices and Medicinal Plant Research, Bose Institute, India, 2-4 April, 1998

Sabu, K.K. and S. Seeni. 1996. Biochemical characterization of intraspecific variations in *Andrographis paniculata* Nees. *International Symposium on Perspectives in Biochemistry and Molecular Biology*, Indian Institute of Science, Bangalore. 20-23 Nov, 1996.

Other Publications

- ENVIS Newsletter (Vol.1, Nos 1-4; Vol.2, Nos.1-2) (Member, Editorial Board)
- A handbook (in Malayalam) on water-related diseases prevalent in Kerala (Member, Project Team)
- Kalavastha Vyathianum (in Malayalam), a book on climate change (Member, Project Team)

- Proceedings of the ENVIS workshop held at Munnar on 2-3 April 2009 (Member, Editorial Board)

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> Transdisciplinary Biology (interdis.php)

Soniya E.V , PhD

Scientist G

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Profile

I am interested in understanding the molecular mechanisms working behind the interactions of plants with both biotic and abiotic factors, especially the plant-pathogen interactions and plant stress responses, and the molecular details of metabolic pathways for the production of secondary metabolites.

Academic Positions

Scientist G

Rajiv Gandhi Centre for Biotechnology

^

Education

PhD Botany 1995

Department of Botany, University of Kerala

Awards

2019

National Woman Bioscientist Award, DBT

Fellow, National Academy of Science India

2007-2008

INSA/DFG visiting Scientist in Max Planck Institute of Chemical Ecology, Jena, Germany

Fellow, National Academy of Biological Sciences

2017

Best Woman Scientist, National Academy of Biological Sciences

Fellow, Kerala Academy of Sciences

Patents



Primers for developing genotype specific marker in *Piper nigrum*. 3377/DEL/2005



Memberships



Member, *Indian Society of Cell Biology*



Member, *Society for Plant physiology and Biochemistry*



Member, *Kerala Academy of Sciences*



Member, *Society for Biotechnologists (INDIA)*



Member, *National Academy of Science India*

CONTACT

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Research Programs

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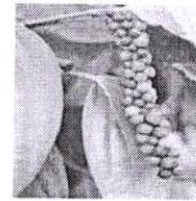
Soniya E.V , PhD
Scientist G

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Research Summary

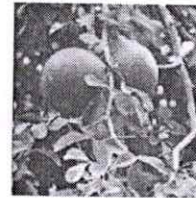
Trans-Disciplinary Genomics Program

1. Plant Genomics and Metabolomics (plant-pathogen interactions, plant stress response and metabolic pathways for production of secondary metabolites.
2. India Genome Project (A Department of Biotechnology multi institute program on whole genome sequencing of Indian populations to create a detailed catalog of genetic variations.
3. Creation of an Indian DNA Fingerprint Database.



Characterization of the active molecular repertoire in the stress regulation of black pepper

Description of the study



Molecular characterization of plant type III polyketide synthase involved in the biosynthesis of medicinally important phenylpropanoids

Description of the study

Current Research Grants

- | | |
|------|---|
| 2018 | Characterization of key structural genes involved in flavonoid synthesis in Indian Gooseberry, (<i>Emblica officinalis</i> Gaertn) |
| 2015 | Kerala State Council for Science, Technology and Environment [KSCSTE] |

2018 Cataloguing of micro RNAs and elucidation of its role in stress adaptation/response in
black pepper
2015
Department of Biotechnology [DBT]

Previous/ Completed Research Grants

1. Identification and functional validation of Type III PKS from *A. marmelos* involved in anthranilic acid derived alkaloid biosynthesis.
Department of Science & Technology [DST] 2012-2015
2. Evaluation of differentially expressed miRNAs during biotic stress in black pepper.
Council of Scientific and Industrial Research [CSIR] 2011-2014
3. A database of Type III Polyketide Synthase protein structures with specific catalytic function utilizing structural bioinformatic methods.
Department of Information Technology, Government of India. 2008-2011
4. Genetic transformation of ginger to improve fungal resistance against *Pythium aphanidermatum*.
Department of Science & Technology, Government of India 2007-2010
5. Isolation and full length cloning of abiotic stress induced CDPK gene and its promoter.
Kerala State Council for Science, Technology and Environment [KSCSTE] 2006-2009
6. Tissue specific expression of antifungal gene in *Piper nigrum* L.
Department of Biotechnology [DBT] 2005-2008
7. Genetic transformation studies in *Piper nigrum* L.
Department of Biotechnology [DBT] 2002-2005
8. Expression of Hepatitis B surface antigen in *Cucumis sativus* L.
Kerala State Council for Science, Technology and Environment [KSCSTE] 2002-2005
9. Improvement of spices crop by biotechnological intervention.
Department of Biotechnology, Government of India (multi institutional)

10. Field evaluation of tissue cultured plants of spices and assessment of their genetic stability using molecular methods.

Department of Biotechnology, Government of India (Collaborative project with IISR)
2000-2003

11. Developmental techniques for the mass multiplication of rare medicinal plants through in vitro methods.

NATP 2001-2004

CONTACT

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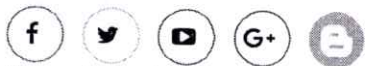
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preventive measures taken against the wide spreading of COVID 19, visitors will be permitted in JNTBGRI Garden.

Biotechnology and Bioinformatics Division

Head of Division Mission and Vision



Conservation and sustainable utilization of plant genetic resources of the nation through biotechnological intervention, knowledge discovery and promoting lab-to-land programme.

[View Brochure](#)

Dr. William Decruze
Senior Scientist

Major services offered

- Facility for *in silico* drug discovery
- Genetic diversity / phylogeny analysis
- Training / Project guidance / internships in Plant Tissue Culture, Bioinformatics, Molecular Biology
- Supply of quality planting materials including seeds of vegetables, coconut seedlings, and seeds of fruit plants etc.

Scientists

Dr. S Sreekumar
Senior Scientist

Dr. K K Sabu
Senior Scientist

Area of Research

- Conservation through biotechnology intervention mainly focusing on *in vitro* propagation, leaf restoration and/or cultivation of prospective medicinal plants, insect repellent plants, orchid, musa, cardamom, bamboos, etc; *in vitro*/cryobanking of endangered and endemic orchid medicinal plants of Western Ghats.
- Functional genomics and population genetics of rattans, cardamom, medicinal plants, etc. **More>>**
- Bioinformatics research focusing on validation of the efficacy of medicinal properties of selected plants through *in silico*, *in vitro* and *in vivo* screening and identification of lead molecule development of biodiversity databases. **More>>**

Dr. C K Biju
Scientist

Dr. R K Radha
Scientist

Mr. M Raveendran
Scientist

Technical Officers

Dr. A S Hemanthakumar

Mrs. A Shylajakumari

Supporting staff

Ms. V. S. Sindhu
Lab Assistant

Mrs. S. Syamalakumari
Lab Attendant

List of important recent research findings

- The scientific validation of insect repellent properties of *Etilingera fenzlii* (an ethnobotanical repellent plant species of the Andaman Nicobar Islands) is being carried out.
- Accomplished chemical profiling of 12 accessions of 'sweet flag' (*Acorus calamus* L.) germ from the Western Ghats.
- Accomplished enhancement of anthocyanin production in suitable *in vitro* culture system (root) of *Ipomoea batatas* (L.) Lam.
- In vitro* regeneration studies and bio prospecting of all accessions of *Salacia* species across Western Ghats
- Established auxin induced root culture system in *Rubia cordifolia* Linn., an important medicinal plant.
- Secondary metabolite content in *Centella asiatica* has been enhanced through use of metabolic stimulants which resulted in around 6-fold increase in madecassoside levels whereas expression analysis showed an upregulation of approximately 50-fold. These findings were explored for better understanding of the regulation of terpenoid biosynthesis and biotechnological application for the increased production of these bioactive molecules.

- Developed database application packages and organised two database (1) "Plants, phytochemicals and bioactive compounds", (2) Virtual herbarium of University of Kerala
- Evaluated anti-tuberculosis activity of *Anacardium occidentale*, *Passiflora edulis* and *Plectranthus vettiveroides* through *in silico* method.
- Identified leads against Dengue virus NS3 protease and host IMPDH2 from phytochemicals derived from 5 anti-dengue herbs. The results are communicated for publication.
- Studied the anti-hepatitis-C activity of selected medicinal herbs and identified lead molecules. Results are communicated for publication.
- Digitized 5000 herbarium specimens' images and data on the virtual herbarium database of the Department of Botany, University of Kerala as part of a joint herbarium digitizing programme between JNTBGRI and Department of Botany, University of Kerala.
- A total of 2374 phytochemicals from the selected nine plants viz. *Aegle marmelos* (L.) (Merr.), *Ananas comosus* (L.) Merr., *Annona squamosa* L., *Artocarpus heterophyllus*, *Carica papaya* L., *Limonium* (L.) Osbeck, *Punica granatum*, *Syzygium aromaticum* (L.) Merr. & L.M.Perry, and *Tamarindus indica* L. were screened through *in silico* method against molecular targets of SARS-CoV-2 such as main protease (Mpro), spike protein, RNA dependent RNA polymerase (RdRp) and Angiotensin Converting Enzyme-2 receptor (ACE2) and identified potential lead molecules.

Major programmes initiated/conducted recently

- In silico* evaluation of anti-SARS-CoV-2 activity in selected plant-derived nutraceuticals
- Virtual herbarium of the Department of Botany University of Kerala - A technology sharing programme initiated with the University of Kerala.
- Landscaping and gardening at G.V. Raja Sports School - An expertise sharing programme
- Species distribution modelling and bioprospecting of wild germplasm of *Salacia* species (highly valued antidiabetic plants) across the Western Ghats (National Medicinal Plant Board, Govt of India)
- Utility of Semicomplex and screening of ethno botanical insect repellent plant species from Andaman Nicobar Islands in pest/insect management and its popularization as an eco-friendly product (Plan funded program)
- Exploration of Banana Biodiversity and its Biotechnological Research in Nagaland (DBT, Govt of India)
- Enhancement of anthocyanin production in suitable *in vitro* culture system (cell / root) of *Ipomoea batatas* (L.) Lam. (PDF program, DST, Govt. of India)

External funded projects on-going

Name of Project	Funding Agency	Amount
Species distribution modelling and bioprospecting of wild germplasm of <i>Salacia</i> species (highly valued antidiabetic plants) across the Western Ghats	NMPB, GOI	33.2304 (16.6152lakhs JNTBGRI and 16.6152lakhs for IIHR)
Exploration of Banana Biodiversity and its Biotechnological Research in Nagaland	Dept. of Biotechnology, Govt. of India	27.63
Population structure and genetic variability analysis of <i>Cullenia exarillata</i> populations in Western Ghats	Science and Engineering Research Board, DST, Govt. of India	32.18

Analysis of genetic diversity, development of sex linked SCAR markers and marker-assisted selection of Asian Palmyra palm (<i>Borassus flabellifer</i> L., Arecaceae)	Dept. of Biotechnology, Govt. of India	22.34
Digitization of Botanical Herbarium of the Department of Botany, University of Kerala	University of Kerala	10
Landscaping and Gardening in the G.V. Raja sports school campus	Directorate of Sports & Youth Affairs, Govt. of Kerala	49.98

Recent Papers in Journals

1. Sreeja Devi P S, Neethu S Kumar, K K Sabu. 2021. Phytochemical profiling and antioxidant activity in different parts of *Artocarpus heterophyllus* Lam. (Moraceae): A review on current status of knowledge. *Future Journal of Pharmaceutical Sciences* 7, Article number: 30. Springer Nature Publishers. Publ 28 January 2021. <https://doi.org/10.1186/s43094-021-00178-7>
2. Shefin Basheera, S. Sivanandan* and B. C. Kamalan (2021). Anti-Tuberculosis Activity in *Punica granatum*: *In silico* Validation and Identification of Lead Molecules. *Indian J Pharm Sci* 2021;83(2): 321, DOI: 10.36468/pharmaceutical-sciences.778. IF 0.721
3. Goh W L, S Sungkaew, A Teerawatananon, D Ohrnberger, E A Widjaja, K K Sabu, B Gopakumar, K Koshi, N-H Xia, K M Wong. 2020. The phylogenetic position and taxonomic status of the Southeast Asian bamboo genera *Neohouzeaua* and *Ochlandra* (Poaceae: Bambusoideae). *Phytotaxa* 4 (2): 107–122. <https://doi.org/10.11646/phytotaxa.472.2.2>
4. Gouri, P. R., Jisha, S., and K. K. Sabu. 2020. Dataset on Discovery of MicroRNAs in *Centella asiatica* (L.) Urb. Data in Brief 106451. Available online 22 October 2020. <https://doi.org/10.1016/j.dib.2020.106451>
5. Arun R P, C T Riyas, K K Sabu. 2020. A review on the unexplored and underutilized *Arenga* species in India. *Current Botany*. 11: 226-232. Published online: 2 December 2020. <https://doi.org/10.25081/cb.2020.v11.6252>
6. Sreeja Devi P S, Neethu S Kumar and K K Sabu. 2020. Total phenolics, flavonoid contents and antioxidant potential by DPPH scavenging activity in different varieties of *Artocarpus heterophyllus* (Jackfruit) from southern districts of Kerala. *Journal of Advanced Scientific Research* 11 (4) Suppl
7. Siju S. and K. K. Sabu. 2020. Genetic resources of Asian Palmyrah palm (*Borassus flabellifer* L.): comprehensive review on diversity, characterization and utilization. *Plant Genetic Resources*. Published online: 08 January 2021. <https://doi.org/10.1017/S1479262120000477>
8. Seeja G and Sree Kumar S (2020) A review on cybrids: An approach for plant improvement. *Crop Science* 55(1&2):48-56. DOI:10.31830/2454-1761.2020.011. IF:1.2
9. Seeja G and Sree Kumar S (2020) Doubled haploids in genetic improvement: A review. *International Journal of Recent Scientific Research* 11(1):36941-36949. DOI: 10.36468/ijrsr.2020.1101.5029. IF: 7.383

<http://dx.doi.org/10.24327/ijrsr.2020.1101.5029>. IF: 7.383

Recent Book chapters published:

1. Shefin B, Sree Kumar S and Biju C.K. *In silico* Evaluation of Anti-SARS CoV-2 Activity of *Punica granatum* L. *Phytochemicals Chukwuebuka Egbuna* (ed) in *Coronavirus Drug Discovery*, Elsevier press)
2. *In Vitro* Multiplication and Conservation of Threatened Medicinal Plants of Western Ghats of India (RADHA RK). 2020. In: Rajasekharan PE., Wani S. (eds) *Conservation and Utilization of Threatened Medicinal Plants* Springer, Cham. https://doi.org/10.1007/978-3-030-39793-7_7
3. Satheesan, J., & Sabu, K. K. (2020). Endophytic Fungi for a Sustainable Production of Major Bioactive Compounds. In *Plant-derived Bioactives* (pp. 195-207). Springer, Singapore.
4. Anjali N & Sabu K K (2020). Role of miRNAs in biotic and abiotic stress management in crop plants. In: *Sustainable Agriculture in the Era of Climate Change*. Edited by R. Roychowdhury (Springer Nature USA). Pp. 513-532. https://doi.org/10.1007/978-3-030-45669-6_22
5. Jisha S & Sabu K K (2020). Endophytic Fungi for a Sustainable Production of Major Plant Bioactive Compounds. In: *Plant-derived Bioactives: Production, Properties and Therapeutic Applications*. Edited by Dr. Mallappa Kumara Swamy. https://doi.org/10.1007/978-981-15-1761-7_8. First Online May 2020.
6. Nadiya F & Sabu K K (2020). Small RNA manipulation in plants: Techniques and recent developments. In: *Plant Small RNA: Biogenesis, Regulation and Application*. <https://doi.org/10.1016/B978-0-12-8170001-8-3>

Recent Awards/Honours:

Keerthi Sugathan has bagged the best poster presentation award in Biotechnology for the paper titled "*In silico* evaluation of anti-SARS COV-2 activity in *Aegle marmelos*." in the 33rd Kerala Science Congress held from 25 to 30 January, 2021.

Recent Ph. Ds. awarded

Name of Candidate	Title of Thesis	University
Anju Sudhakaran	<i>Ex situ</i> conservation and Chemical characterization of <i>Etilingera fenzlii</i> (Kurz) Skronick & M.Sabu (Zingiberaceae) - The honey bee repellent endemic plant species of the Andaman Nicobar Islands	University of Kerala
Deepa V	Bioprospecting of selected medicinal plants for viper anti-venom drug	University of Kerala

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Contact

www.linkedin.com/in/dr-preetha-ts-5a02071b9 (LinkedIn)

Dr Preetha TS

Assistant Professor at University College, Thiruvananthapuram
Thiruvananthapuram





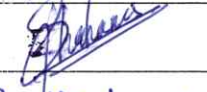
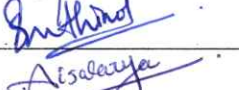
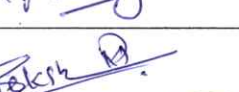
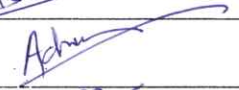
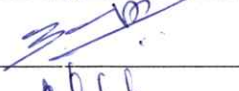
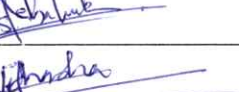
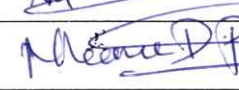
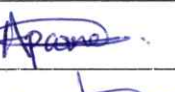





Experience

University College, Thiruvananthapuram
Assistant Professor

Kerala Biotechnology Commission Sponsored
Hands-on training on Plant Tissue Culture techniques and Applications
2nd to 12th August 2017

Attendance Sheet

Date : 8-8-2017

Sl.No	Name	Signature
1	Deepak v	
2	Saikrishna	
3	Sona S	
4	Krishna Priya	
5	Neeraja Suresh	
6	Shahanas Basheer	
7	Sruthimol C Bhasi	
8	Aiswarya S	
9	LekshmiSanthosh	
10	Aswathy Mohan	
11	Surya B S	
12	NehaLukose	
13	NidhisaSali S	
14	Meenu D Pillai	
15	Aparna K V	
16	Greeshma Radhakrishnan	
17	C Charankumar	
18	V Prabhu	

19	Chandhni Jagadeesan	<u>Chandni</u>
20	Dinu P S	<u>Dinu</u>
21	Melna E S	<u>Melna</u>
22	ShriramNath V L	<u>Shriram</u>
23	Sreelakshmi R	<u>Sreelakshmi</u>
24	Lekshmi R	<u>Lekshmi</u>
25	Amal Anand	<u>Amal</u>
26	Parvathy Nandakumar	<u>Parvathy</u>
27	Lekshmi S Kumar	<u>Lekshmi</u>
28	Parvathy J	<u>Parvathy</u>
29	Athira Rajan	<u>Athira</u>
30	Anaswara Syam	<u>Anaswara</u>
31	Anjumol K P	<u>Anjumol</u>
32	Maria Joy	<u>Maria</u>
33	Gayathri U	<u>Gayathri</u>
34	Litty Thomas	<u>Litty</u>
35	Elma Susan Reji	<u>Elma</u>
36	Ambili M Thomas	<u>Ambili</u>
37	Aleena T Mathews	<u>Aleena</u>
38	Boby George	<u>Boby</u>

39	Athira Krishnan R	<u>Athira</u>
40	Kavya Krishna	<u>Kavya</u>
41	Preena S Parvathy	<u>Preena SP</u>
42	Swathika Ajith	<u>Swathika</u>
43	Remya L	<u>Remya</u>
44	Sneha S Nair	<u>Sneha</u>
45	Rahmath Khadin	<u>Rahmath</u>
46	Veniraj	<u>Veniraj</u>
47	Krishna R Pillai	<u>KRPillai</u>
48	Likhitha L	<u>Likhitha</u>
49	Neema R Soman	<u>Neema</u>
50	Aswathy Viswam	<u>Aswathy</u>
51	Athira K S	<u>Athira</u>
52	Semina Haneef	<u>Semina</u>
53	Anu Sathyan	<u>Anu</u>
54	Arya S Vijayan	<u>Arya</u>
53	Fathima Beevi S	<u>Fathima</u>
55	Gayathri R Chandran	<u>Gayathri</u>

