

Dr. MANJU P R

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Summary

My research interest in the field of plant genetic resources, its collection, conservation, evaluation and utilization started with my PG and PhD programs at the Department of Vegetable Science, College of Agriculture, Vellayani. The experience was the foundation as the same was extended to plant genetic resource management in banana while I got appointed as Assistant Professor (Hort.) in Kerala Agricultural University, Banana Research Station, Kannara in 2011. My tenure at Kannara lasted for 11 years as Jr. Horticulturist under the ICAR – AICRP on Fruits, which involved two mandate crops viz., Banana and Jackfruit. The station maintains a field germplasm of more than 230 banana varieties which is considered to be one of the best and a great asset to the university. Apart from works related to PGR, I was in charge of experiments in crop production, orchard management and nutrition of banana. Being the scientist in-charge of plant tissue culture lab at the station, I was able to distribute and popularise among farmers, promising varieties of banana identified through germplasm evaluation by mass production of tissue culture plants. These promising varieties were later on recommended for including in the Package of Practices Recommendations of KAU as well. Working hard as a Jr. Horticulturist at Kannara helped me to have a strong association with the various stake holders viz., farmers, KVK, Department of Agriculture, Kerala State and with other eminent scientists in the ICAR and various SAU's in the country. I feel immensely proud to say that during my career at Kannara, the centre bagged the first/second best centre award during consecutive years and is still one of the best rated in the project. I am currently placed in the Department of Fruit Science, College of Agriculture, Vellayani since July, 2022. I am guiding PG/ PhD students as Major Advisor and as course teacher in various courses under UG/PG/PhD offered from the Department.

Research Highlights

- Collection, characterization, conservation, evaluation and utilization of banana and jackfruit germplasm.
- Promising banana and jack varieties were recommended for including KAU Package of Practices Recommendations. This includes two Nendran clones (Attunendran and Myndoli), two banana introductions (Popoulu and Kluai Namwa Khom) and Jack variety Pechiparai 1. The two introductions were also recommended as technology in AICRP (Fruits).
- Standardized nutrient schedule for banana for Kerala which includes

Standardization of stage wise fertilizer schedule based on phenology for Nendran banana

Organic nutrient schedule for Nendran banana

Experience

Joined Kerala Agricultural University as Assistant Professor (Horticulture) in the year 2011.

Education

- Graduated in Agricultural Science from Kerala Agricultural University (1999)
 - Post Graduation in Vegetable Science from Kerala Agricultural University (2002)
 - Ph.D in Vegetable Science from Kerala Agricultural University (2006)
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Area of Specialization

Plant Genetic Resource – collection, characterization, evaluation and utilization

Awards & Recognitions

- Best Lead Presenter – IInd Place’ award in the 5th Annual Group Discussion of AICRP (Fruits) held at NRCB, Trichy during 15th to 18th Feb, 2018.
- Best Centre Award – 2019 to Banana Research Station, Kannara in the 7th Annual Group Discussion of AICRP (Fruits) held at PAU, Ludhiana during 16th to 19th Jan, 2020.
- Best Centre Award – 2020 IInd Prize to Banana Research Station, Kannara in the 8th Annual Group Discussion of AICRP (Fruits) held as virtual meeting during 3rd to 6th Mar, 2021.
- Best Centre Award – 2020 IInd Prize to Banana Research Station, Kannara in the 9th Annual Group Discussion of AICRP (Fruits) held as virtual meeting during 8th to 11th Mar, 2022.

Research Projects

Completed

1. ‘Entrepreneurship development and sustainable livelihoods for Scheduled Caste / Tribe women through the production of tissue culture plants’ – Rehabilitation of existing tissue culture laboratory. Funded by State Horticulture Mission. (Outlay Rs. 9.35 lakhs)
2. Station wise funding - Evaluation of the response of different banana varieties to macropropagation at BRS, Kannara (Outlay Rs. 4.0 lakhs)
3. Station wise funding - Strengthening infrastructure facility for fibre extraction, processing and value addition (Outlay Rs. 2.0 lakhs)
4. PI in charge of Nine experiments under Horticulture in ICAR –AICRP ON FRUITS from 2011 to 2022.

Associates in projects

1. Annual State Plan project 2021-22 -, Station wise funding - Establishment of technology based demonstration units at BRS, Kannara (Outlay Rs. 3.0 lakhs)
2. Annual Plan 2017-18 – Station wise funding on on-going research projects and minor infrastructure support – ‘Development of health proactive powder mixes and nutritive delicacies based on raw and ripe banana’ (Outlay Rs. 2.0 lakhs)

Development projects handled

- Production of seeds / planting materials
- Mass production banana tissue culture plants (Revolving Fund)
- Mass production of Sampoorana KAU multimix (Revolving Fund)

Publications

Journal Articles

1. **Manju, P.R.** and Pushpalatha, P.B. 2022. Macropropagation in Banana (*Musa* spp.): Varietal Response to media and field performance of plantlets against suckers. *Int. J. Bio-resour. Stress Manag.* 13(10) : 1064-1075.
2. **Manju, P.R.** and Pushpalatha, P.B. 2022. Evaluation of exotic banana germplasm for growth and yield attributes under Kerala conditions. *J. trop. Agric.* 60(1) : 136-143.
3. **Manju, P.R.** and Pushpalatha, P.B. 2022. Effect of organic nutrients on the yield and quality of banana cv. Nendran (*Musa* spp., AAB). *Int. J. Bio-resour. Stress Manag.* 13(2) : 179-186.
4. Debnath, S., Bauri, F.K., Swain S., Patel, A.N., Patel, A.R., Shaikh, N.B., Bhalerao, V.P., Baruah, K., **Manju, P.R.**, Suma, A., Menon, R., Gutam, S. and Patil, P. 2021. Studies on high density planting and nutrient requirement of banana in different states of India. *J. Hortic. Sci.* 16(2) :152-163.
5. **Manju, P.R.**, Swain, S., Pradhan, B.K., Pushpalatha, P.B., and Patil, P. 2021. Effect of banana (*Musa* spp.) intercropping with root and tuber crops. *Current Hort.* 9(2) : 26-30.
6. **Manju, P.R.** and Pushpalatha, P.B. 2020. Macropropagated plantlets in banana: Performance evaluation with suckers and tissue culture plants in Grand Naine and Nendran. *J. trop. Agric.* 58(2) : 263-268.
7. Menon, R., Nair, S., Suma, A., **Manju, P.R.**, Cherian, A.K., Patil, P., and Agrawal, A. 2014. Introduction, evaluation and adoption of an exotic banana (*Musa* AAB cv. 'Popoulu') (EC320555) to Kerala, India. *Indian J. Plant Genet. Resour.* 27(3) : 298-302.
8. **Manju, P.R.** and Sreelathakumary, I. 2002. Genetic variability, heritability and genetic advance in hot chilli (*Capsicum chinense* Jacq.). **Journal of Tropical Agriculture** 40: 4-6.
9. **Manju, P.R.** and Sreelathakumary, I. 2002. Quality parameters in hot chilli (*Capsicum chinense* Jacq.). *Journal of Tropical Agriculture* 40: 7-10.
10. **Manju, P.R.** and Sreelathakumary, I. 2004. Genetic divergence in hot chilli (*Capsicum chinense* Jacq.). *Capsicum and Eggplant Newl.* 23: 69-72.
11. **Manju, P.R.** and Sreelathakumary, I. 2002. Genetic cataloguing of hot chilli (*Capsicum cinense* JACQ) types of Kerala. *Journal of Tropical Agriculture*, 40: 42-44.

Papers as abstracts in conference proceedings

1. Anjali, C., Pushpalatha, P. B., **Manju, P. R.**, Gomez, S. and Markose, A.M. 2023. Male buds of banana- a prospective source of dietary fiber. In : Sankaran M., Karunakaran G., Anuradha Sane, Rajiv Kumar, Raja Shankar, Raghu B.R., Safeena S.A., Singh T.H., Sridhar Gutam, Nair S.A., Kanupriya C., Vivek Hegde, Sujatha S. Book of Abstracts, International Seminar on Exotic and Underutilized Horticultural Crops, October 17-19, 2023., Director, ICAR-IIHR, Bengaluru- 560 089, India, p.368.
2. Anjali, C., Pushpalatha, P. B., **Manju, P. R.**, Saji Gomez and Markose, A. M. 2023. Male buds of Kunnan banana –A potential source of dietary fibre in cookies. In : Kerala Science Congress, 10th to 14th February, 2023, Kuttikkanam, Idukki, p. 47-48.
3. Divya, H, Simi, S., **Manju, P.R.** and Anaswara, S. J. 2023. India's fruitful tomorrow: Exploring future fruit crops. In : Sankaran M., Karunakaran G., Anuradha Sane, Rajiv Kumar, Raja Shankar, Raghu B.R., Safeena S.A., Singh T.H., Sridhar Gutam, Nair S.A., Kanupriya C., Vivek Hegde, Sujatha S. Book of Abstracts, International Seminar on Exotic and Underutilized Horticultural Crops, October 17-19, 2023., Director, ICAR-IIHR, Bengaluru- 560 089, India, p.17.
4. Greeshma, K.G., Pushpalatha, P.B. and **Manju, P.R.** 2018 Varietal suitability of banana pseudostem for pickling (Ab.) National Banana Fest, Thiruvananthapuram, 17-21 February 2018, pp 55.
5. **Manju P.R.**, Saudamini Swain, Rema Menon, Praveen Jhologikar, Pujari.C.V., Baruah.K., Bauri F.K., Bhagavan B.V.K, Patel A.N. and Prakash Patil (2018) Evaluation of intercrops in banana: A study for increasing productivity for better income under different agro climatic conditions of India. 8th Indian Horticulture Congress, 17th to 21st January, Raipur, Chhattisgarh 2019, p. 82-83.

6. **Manju, P. R.**, Menon, R. and Pushpalatha, P. B. 2018. Standardisation of macropropagation in banana: A farmer friendly technology for the mass production of quality planting materials (Ab), Kerala Science Congress Thalassery 28-30 January pp 44.
7. **Manju, P. R.** and Rajamony, L. 2012. Molecular characterization of vegetable cowpea (*Vigna unguiculata* (L.) Walp.) landraces of humid tropics using RAPD markers. In Proceedings of 5th Indian Horticulture Congress, 6-9th November, 2012, PAU, Ludhiana, p.551
8. **Manju, P. R.** and Rajamony, L. 2014. Characterization and selection of superior vegetable cowpea (*Vigna unguiculata* (L.) Walp.) accessions of humid tropics. In (Abs.) : Proceedings of International conference on Horticulture for nutritional, livelihood and environmental security in hills : opportunities & challenges, 22-24th May, 2014, Kalimpong, Darjeeling, West Bengal, p. 38.
9. **Manju, P. R.**, Menon, R. and Pushpalatha, P. B. 2017. Studies on growth, yield and quality of banana cv. Rasthali (AAB) as influenced by micronutrients. In (Abs) : The National Seminar on Natural Resources Management for Horticultural Crops under Changing Climatic Conditions (NRMHCCC), 16th & 17th March, 2017, Centre for Water Resources Development and Management (CWRDM), Kozhikode, Kerala. pp. 315-317.
10. **Manju, P. R.**, Pushpalatha, P.B., Greeshma, K. G. and Chinchu Paulson. 2019. Evaluation of nutritional composition of raw banana powder of different varieties and development of health proactive infant food. (Abs.) In Proceedings : International Conference on Food Security through Agriculture & Allied Sciences (FAAS – 2019), 27-29 May, 2019, Tribhuvan University, Kathmandu, Nepal, p. 93-94.
11. **Manju, P.R.**, Pushpalatha, P.B, Menon, R. and Vimi Louis. 2018. Standardization of stage wise nutrient requirement in banana Cv. Nendran (Ab.) National Banana Fest, Thiruvananthapuram, 17-21 February 2018, pp 45.
12. **Manju, P.R.**, Greeshma, K.G, and Pushpalatha, P.B. 2018. Varietal suitability of banana male bud for pickling (Ab.) National Banana Fest, Thiruvananthapuram, 17-21 February 2018, pp 56.
13. Pushpalatha P.B., **Manju P.R.** and Chinchu Paulson. 2020. Raw banana flour: An assessment of its suitability for baked products. (Abs) International conference on Banana Innovations in sustainable production and value chain management in banana. Tiruchirappalli, Tamilnadu, India 22 – 25 February, p.243.
14. Pushpalatha P.B., **Manju P.R.** and Chinchu Paulson (2020) Development and evaluation of banana pseudostem juice based RTS beverage. (Abs) *International conference on Banana Innovations in sustainable production and value chain management in banana* – Tiruchirappalli, Tamilnadu, India 22 – 25 February, pp. 242
15. Pushpalatha, P.B., **Manju, P. R.**, Greeshma, K. G. and Chinchu Paulson. 2019. Development of nutri-rich diverse banana powder based products. (Abs.) In Proceedings : International Conference on Food Security through Agriculture & Allied Sciences (FAAS – 2019), 27-29 May, 2019, Tribhuvan University, Kathmandu, Nepal, pp.50-51.
16. Ragesh, G., Manju, P R, Pushpalatha P B, and Patil, P. 2021. Population dynamics of major insect pests of jackfruit in Kerala under Fixed plot survey. International Symposium on Tropical Fruits 2021(Virtual), Malaysia, 28-31 September 2021, p.33.
17. Ragesh, G., Tom Cherian, Manju, P R, Pushpalatha P B and Prakash Patil. 2021. Record of banana as an alternate host of leaf beetle *Sastroides besucheti* Medvedev (Coleoptera: Chrysomelidae: Galerucinae) in India (Abs.) International Symposium on Tropical Fruits 2021 (Virtual), Malaysia, 28-31 September 2021, p.91.
18. Sanjit Debnath, Bauri F.K , Swain, S., Patel A.N., A.R Patel, N.B.Shaikh, V.P Bhalerao, Baruah K. **Manju P.R.**, Suma, A., Menon, R., Suresh, P., Uma, S. Gutam, S. and Patil, P. 2019. Studies on high density planting and nutrient requirement of banana in different states of India. 8th Indian Horticulture Congress, 17th to 21st January, Raipur, Chhattisgarh 2019, p. 115-116.
19. Simi, S., Sooraj, C. S. and **Manju, P. R.** 2022. Physico-chemical characterization of indigenous mango (*Mangifera indica* L.) varieties of Southern Kerala. In : Rajendran, S., Muralidhara, B. M., Rani, A. T. and Madhu, G. S. (Eds.). Souvenir and Abstracts. National Symposium on Horticultural Crops of Humid Tropics for Nutritional and Livelihood Security (NSHCHT) – 2022, 2nd to 3rd December, 2022, Hotel Crystal Hall, Madikeri, Kodagu, Karnataka. p. 114.
20. Tharene, R. S., **Manju, P. R.** and Simi, S. 2022. Polyamines : An overview of it's function and role in humid tropical fruit crop production. In : Rajendran, S., Muralidhara, B. M., Rani, A. T. and Madhu, G. S. (Eds.). Souvenir and Abstracts. National Symposium on Horticultural Crops of Humid Tropics for Nutritional and

Livelihood Security (NSHCHT) – 2022, 2nd to 3rd December, 2022, Hotel Crystal Hall, Madikeri, Kodagu, Karnataka. p. 176.

21. Vimi Louis, Namitha, P. M., Sanjana Antony and **Manju, P.R.** 2018. Immunocapture –PCR for detection of Banana Bract Mosaic virus (Ab), Kerala Science Congress Thalassery 28-30 January pp 67.
22. Vimi Louis, Namitha, P.M, **Manju P.R.** and Pushpalatha, P.B. 2018. Virus indexing – For quality disease free tissue culture plants of banana (Ab.) National Banana Fest, Thiruvananthapuram, 17-21 February 2018, pp 43.

Full paper in conference proceedings

Manju P R, Pushpalatha P B and Chinchu Paulson. 2019. Banana fibre : An assessment of its yield, recovery and economics of utilization. Proceedings of the International Seminar, Coir Kerala 2019 – An International event on coir and natural fibre products, 4th to 8th December, 2019, Alappuzha, Kerala, pp. 152-159.

Manju, P.R., Pushpalatha, P.B., Ragesh, G., and Patil, P. 2021. Improvement of banana cv. Rasthali (*Musa* spp., AAB) through clonal selection. (In Proceedings of International Symposium on Tropical Fruits 2021 (Virtual), Malaysia 28-31 September 2021: pp.18.)

Technical bulletin

Patil, P., Priyadevi, S., Gutam, S., Manju, P.R., Tetali, S., Bisane, K. D. and Jeevitha, S. 2023. Comprehensive Production Guide and Regional Technology Compendium for Banana. ICAR – AICRP on Fruits, p. 137.

EXTENSION ACTIVITIES

Organizing / participating in exhibitions : 13 (International – 3, State – 10)

Radio talks – 3

Popular articles – 13

Technical leaflets / booklets / brochure – 13

Student Guidance (Major Advisor/ Advisory Committee member)

M. Sc.

Within KAU: 2 (Ongoing)

Ph. D

Within KAU: Ongoing : 1

Membership in Professional Associations

Life member –

- Indian Society for Root Crops
- Indian Society for Horticultural Crops
- Society for Horticultural Research and Development
- Indian Society of Plant Genetic resources