# Aromatic and Medicinal Plants Research Station, Odakkali

Address: Aromatic and Medicinal Plants Research Station, Odakkali Odakkali,
Asamannoor P.O. Ernakulam- 683 549, Kerala

Phone : 0484-2658221 Mobile:

Email : amprs@kau.in Website: www.//amprsagrotech.nic.in

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| **Station Head** | | Dr. Baby P. Skaria | |
| **Longitude** | | between 76°32'35" and 76°32'55" East | |
| **Lattitude** | | between 10°5'40" and 10°6'0" North | |
| **Nearest City/ Town** | Perumbavoor & Kothamangalam | **Distance from Nearest City/ Town (km)** | 10 |
| **Nearest Railway Station** | Aluva | **Distance from Nearest Railway Station (km)** | 27 |
| **Nearest Airport** | Cochin International Air port, Nedumbassery | **Distance from Nearest Airport (km)** | 24 |

## About Station

Medicinal and aromatic plants occupy a prime position in the research profile of Kerala Agricultural University. The Aromatic and Medicinal Plants Research Station was established on 15th March 1951 as "Lemongrass Breeding Station" under the Department of Industries of the erstwhile Travancore-Cochin Government. Consequent to the formation of Kerala Agricultural University in 1972, the station became an integral part of the University's research net work. Diversifying the research emphasis of the centre to cover all other tropical aromatic and medicinal plants, the station was renamed as Aromatic and Medicinal Plants Research Station (AMPRS) in 1982 and was brought under direct administrative control of the Associate Director of Research (Central Region) of the University.

## Objectives

- Biodiversity conservation and management
- Establishment of gene bank, herbarium and museum
- Research on bio-prospecting and biotechnology
- Research on bio-production comprising eco-farming, seed technology, development physiology, development of agro-technology
- Research on phyto-chemistry including quality assurance, product development and botanicals development
- Technology transfer and management comprising entrepreneurial training, industrial liaison
- Protection of intellectual property rights (IPR)

## Vision

The station looks forward to its future in the fields of bioprostecting, bioproduction, phytochemistry, botanicals development and technology management. Emphasis will be given for evolving superior plant types with high oil yield and citral content in lemon grass. Research on other potential aromatic and medicinal plants will be intensified to develop technologies for large scale as well as homestead cultivation of suitable and commercially viable aromatic and medicinal plants. Efforts will also be directed for designing and developing fuel efficient high recovery distillation units. Basic and applied aspect of post harvest technology of essential oils and medicinal plants will be given emphasis. Research will be directed to extraction, isolation, identification and utilisation of natural products. Synthesis of natural based commercial products like disinfectants/ bioinsecticides/ repellants, natural colouring/ flavouring agents, medicinal principles etc. will be attempted. A systematic survey of the western ghats for medicinal and aromatic plants has to be done. Technologies for large scale as well as homestead cultivation of export potential aromatic plants will be developed. The Regional Analytical Laboratory of the station is envisaged to take up the role of quality testing and monitoring for the interest of both the cultivators and the exporters. Realising the potential role of genetic engineering and biotechnology in natural product synthesis, research will be taken up in this line to meet the future challenges. Research activities will be geared up to elevate this centre to the status of a Centre of Excellence on Aromatic and Medicinal Plants in the country.

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## Mission

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## Achievements

1. Established the world's largest lemongrass germplasm containing 450 accessions.
2. Established a germplasm of other aromatic crops

   Vetiver - 30
   Citronella - 16
   Cinnamon - 250
3. Maintains exhaustive collection of medicinal plants
4. Established a medicinal tree conservation park of about 4000 medicinal trees belonging to 90 RET species
5. Developed agro technology for commercially viable medicinal and aromatic plants. Information on seed dormancy, germination requirements, & viability of medicinal plants developed.
6. The distillation and oil extraction technology of various aromatic plants involving design of equipment, duration of distillation, optimum steam requirement, pre-distillation treatment of raw materials, storage and handling of essential oils etc. have been standardized.
7. Developed post harvest technique for conversion of geranyl acetate in palmarosa oil to geraniol.
8. Established a nationally acclaimed Regional Analytical Laboratory for Quality studies and testing services of medicinal and aromatic plants, raw drugs and finished products
9. Renovated tissue culture laboratory in 2011-12 and started production of TC plants of selected crops
10. A website on Medicinal and aromatic plants agrotechnology has been developed. Domain name of the website created is : http://amprsagrotech.nic.in
11. Released books, CDS, DVDS on medicinal and aromatic plants etc.

    - Skaria, B.P., Joy, P.P., Mathew, S., Mathew, G., Joseph, A. and Joseph, R. 2006. Aromatic plants. Horticulture Science Series Vol. 1. Ed. K.V. Peter. New India Publishing Agency, New Delhi. 270p
    - Skaria, B.P., Raj, M.N. Joy P.P., Mathew, S., Mathew, G. and Joseph, A. 2009. "Oushada sasyangalku oru vazhikatti" Aromatic and Medicinal Plants Research Station, Odakkali, Kerala Agricultural University, Trichur. 270p

- Skaria, B.P., Joy P.P., Mathew, S., Mathew, G. and Joseph, A. 2008. CD on 'Medicinal and Aromatic Plants'. Aromatic and Medicinal Plants Research Station, Odakkali.
- DVD on Agro-technology of selected medicinal crops under NABARD project.
- Videodocumentary on AMPRS

**Details of flagship projects**

- Strengthening Research on Medicinal Plants and Bioactive Components
  *(Under DARE/ICAR's XIIth Plan draft EFC-Memo- Rs.100 crore as Institutional grant for supporting research to Kerala Agricultural University, Kerala)*
  *Duration*: 3 years
  *Outlay*: Rs. 700 lakhs
  *Principal Investigator:* Dr. Samuel Mathew, Professor
  *Project objectives and targets*
  - ♦ To screen medicinal plants for various types of bioactivity – antioxidant, anti-inflammatory, anticancer, antimicrobial and plant regulatory activity and to identify molecules for health care and agricultural applications.
  - ♦ To develop qualitative and quantitative parameters to define quality of important medicinal plants and crude drugs of the state and to develop protocols for quality assurance and quality control.
  - ♦ To study the distribution of therapeutically active toxic heavy metals in different medicinal plants and characterize the elements in selected plants from the point of view of chemical form, biological availability, therapeutical action, pharmacology etc.
  - ♦ To undertake market quality surveillance of selected herbal drugs.
  - ♦ To strengthen quality systems in ISM drug sector through training.

- Germplasm collection and maintenance and evaluation of medicinal and aromatic plants
  Financed by: KAU
  Principal Investigator – Dr. Gracy Mathew, Associate Professor (Agronomy)

- Study of selected adaptogenic plants and Ayurvedic drugs with special reference to polyphenolic composition and antioxidant activity (2007-2011)
  Financed by: National Medicinal Plants Board, Govt. of India, New Delhi
  Financial outlay: Rs. 25.00 lakhs
  *Principal Investigator:* Dr. Samuel Mathew, Professor

- 'Investigations on anti-inflammatory properties of some selected underexploited medicinal
  Plants' with a total financial outlay of Rs. 12.01 lakhs for three years
  financed by Kerala
  State Council for Science, Technology and Environment.
  Principal Investigator – Dr. Ancy Joseph, Assoc. Professor (Hort)

- Central Sector Scheme (NHM) Aromatic Plants & Spices Component (2010-14)
  Financed by : Ministry of Agriculture, Govt. of India
  Financial outlay: Rs. 10.95 lakhs
  Nodal Officer – Dr. Baby P Skaria, Professor & Head

- Facilitation Centre for Medicinal Plants (2008-2011)
  Financed by: National Medicinal Plants Board, Govt. of India, New Delhi
  Total financial outlay: Rs. 30.00 lakhs
  Principal Investigator – Dr. Baby P Skaria, Professor & Head

- Preparation of Web based interactive packages for selected medicinal crops (2010-2012)
  Financed by: NABARD
  Total financial outlay: Rs. 8.90 lakhs
  Principal Investigator – Dr. Gracy Mathew, Associate Professor (Agronomy)

  - Released Varieties of Lemongrass & Cinnamon
    - Lemongrass: OD-19 Sugandhi) - High oil yield and citral content; has nationwide adaptability
    - Cinnamon: ODC-130 (Sugandhini)
  - Superior accessions identified
    - Vetiver: ODV-3
    - Palmarosa: ODP-1, ODP-2
  - Crops for commercial cultivation have been identified and package of practices for cultivation developed for Kacholam, Chengazhineeerkizhangu, Chittaratha, Adalotakam, Chethikoduveli, Neelamari, Chappangam, Brahmi, Kasthurimanjal, Asokam, Kanjiram, Cinnamon, Lemongrass, vetiver, palmarosa, Atapathiyan, Nilappana
  - *Identified alternative sources of perfumery compounds:*
    - OD-468 (*Cymbopogon gidarba*) - richest plant source (75 - 80%) of geranyl acetate
    - OD-455 (*Cymbopogon parkeri*) 'Thathimalangatha'- a concentrated source (60 - 70%) of geraniol

- Development Of Value-Addition Techniques
  - Chemical method for enhancement of geraniol content of palmarosa oil
  - Method for enhancement of plumbagin content of *Plumbago indica* roots
  - Developed lemongrass oleoresin extraction technique for flavouring
- Quality evaluation techniques developed for selected crude drugs
  - Thin layer chromatographic fingerprinting of crude drugs and formulations
  - Standardisation of quality evaluation techniques of crude drugs and formulations

- Anti-inflammatory property of under-exploited medicinal plants excavated
- Anti-oxidant capacity of important medicinal plants, Ayurvedic medicines studied

## Technologies for commercialization

- Chemical method for enhancement of geraniol content of palmarosa oil
- Developed lemongrass oleoresin extraction technique for flavouring

## Varieties Released

Variety of lemongrass released: OD-19 Sugandhi), High oil yield and citral content; has nationwide adaptability
Variety of cinnamon released: ODC-130 (Sugandhini) – for leaf oil

## Research News and Events (recent) concerned with the Station

A website on Medicinal and aromatic plants agrotechnology (http://amprsagrotech.nic.in) developed under NABARD funding with Technical support from National Informatics Centre, Thiruvananthapuram was inaugurated on 14/3/13 by Sri V.S. Menon, Asst General Manager, NABAR