

Technologies and Achievements

Technology package for integrated processing of spices (fresh and dry) with the following product profile

- Essential oil, oleoresin and active ingredients from major spices like ginger, pepper, chilli, turmeric, cardamom etc.
- Commercial level drying of fresh spices
- Micro encapsulated flavours and oleoresins
- Transferred technology to various industries all over India & commercialised
- Established spice processing commercial plants in Manipur, Meghalaya, Sikkim and Karnataka
- Technology package for Palm Oil Mill - Licensed to 5 Project Engineering companies (PEC)
 - Implemented/under implementation-5
 - Palm Oil Mills of 2.5t FFB/hr (expandable to 5t FFB/hr) in 5 states (AP, Goa, Gujarat, Tamil Nadu & Orissa).
- Technology package for carotene rich red palmolein and zero trans shortening
 - Licensed to 5 PECs
 - Implemented/under implementation 6 plants of 50 TPD in 5 states (AP, Tamil Nadu, Punjab, MP & UP)
- Technology package for physical refining of rice bran oil
 - Licensed to 5 PECs
 - Implemented/under implementation 5 refineries of 50 TPD in 4 States (AP, Haryana, Punjab and Rajasthan)
- Technology package for integrated processing of fresh coconut for value added products (coconut cream, coconut milk powder, low fat coconut powder, coco vinegar and charcoal from shell)
 - Licensed to one company
 - Implemented one plant to process 20,000 fresh coconuts / day in Kerala

What we offer

- Technology Business Incubation Centre (TBIC)
- Technology Transfer / Technology licensing
- Turn key project implementation through PEC
- Engineering and Technical consultancy services
- Advisory consultancy in quality control and processing
- Detailed Project Report
- Detailed Engineering
- New process and product development
- Training in quality control and processing
- Testing and analytical services
- Pharmacological validations for metabolic disorders, inflammation and cancer



Technology Business Incubation Centre (TBIC)

- Managing the incubator business and supporting the entrepreneurs with Technical support, IP related information, leads & referrals
- Creating the environment and opportunities for new venture creation of funding networks and information resources
- Nucleating and accelerating collaborative technology projects suitable for new venture development
- Technology intensive consultancy services & assistance in IP and contract related issues
- Technical co-ordination with statutory agencies, financial institutions and prospective end markets

Major programmes

- Technology development and scale up operations for processing of spices and botanicals.
- Design/engineering consultancy, erection and commissioning of industrial plants for agro-products like spices and herbs.
- Scientific validation of natural products against cancer, diabetes and CVDs.
- Functional food products from spices and botanicals for better health management
- Microbial compounds for agricultural and medicinal applications.
- Food toxicants - acrylamide and its occurrence mitigation strategies and toxicity

Contact Details

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सीएसआईआर-एनआईआईएसटी

तिरुवनंतपुरम

CSIR-NATIONAL INSTITUTE
FOR INTERDISCIPLINARY SCIENCE
AND TECHNOLOGY

CSIR-NIIST

THIRUVANANTHAPURAM



AGRO-PROCESSING &
TECHNOLOGY





Our Mission

To provide innovative high quality scientific/technical solutions in the field of process/product development and knowledge generation in the areas related to spices, oil seeds and natural products with international benchmark.

Our vision

Convert APTD into a “Centre of Excellence” of International repute with knowledge and profit centre - leveraging R & D through alliance with industry.

About Agro-Processing and Technology Division

The Division’s core competence is on process and product development and on the transformation of such process into fully engineered technology packages for commercial exploitation for the benefit of society. The Division has set up large number of commercial plants in many states and extended technical expertise in making policy decisions in relevant areas by governmental and non-governmental agencies. In the area of natural products, the focus has been on bioactives from plant, marine and microbial sources for health benefits in the form of nutraceuticals and functional food products. The Division has well trained manpower, pilot plant facilities and sophisticated instruments to undertake research programmes in partnership with industries.

OUR EXPERTISE

- Post harvest processing of spices, oil seeds & other agro produces.
- Generic technologies for producing value added products from spices viz oils, oleoresins etc.
- Extraction and refining of vegetable oils from potential oil seeds.
- Technologies for drying and shelf life enhancement of food and agri products.
- Process development (bench scale) and scale up.
- Process engineering and execution of commercial projects.
- Industry interface for troubleshooting and technology up gradation
- Chemico-biological evaluation of herbs and natural products
- Product development (functional foods, nutraceuticals and ayurvedic products).
- Validation of basic ayurvedic concepts.
- Antimicrobial evaluation of metabolites/molecules from plants and microbes
- Development of bio-fertilisers and bio-pesticides.
- Validation of synthetic compound as fertilisers, weedicides and herbicides.
- Identification and validation of effective microbial enzyme for industrial applications.



What do we do?

- Novel process/product development based on fresh & dry spices and essential oil bearing botanicals for recovery of oils and oleoresins.
- Processing of fresh green ginger for making value added products.
- Drying of heat sensitive materials – Fluid bed drying / dehumidified adsorption drying etc
Shelf life enhancement of agricultural produce through processing
- Chemical and biochemical investigations on spices and their derivatives
- Studies on health benefits of spices

Research activities

- Bioprocessing of botanicals for isolating phytochemicals –Enzymatic route
- Development of technology for shelf-life enhancement of spices and agro-produces
- Technology Business Incubation Center for spices and agro-produces
- Setting up of fresh spice and vegetable processing units



What do we do?

- Basic technology development and expertise related to modern extractions and refining methodology for edible oils and fats (palm oil, rice bran oil etc.)
- Downstream value added products/speciality products from oils and oil seeds for functional food application
- Recovery of active phytochemicals for nutraceutical/ functional food application from oilseeds and their process streams
- Chemical, biochemical and nutritional characterization of oil seeds and its functional constituents
- Scale up studies for the technology developed in bench level to pilot scale & demonstration plants

Research activities

- Modified lipids as functional fats
- Trans-fat and its health implications
- Value added product from Red Palm Olein for functional food/nutraceutical applications
- Designer vegetable oils for functional food/nutritional applications



What do we do?

- Process development for herbal extraction, bioactive phytochemicals and product formulations for nutraceuticals and functional foods.
- Chemical finger printing of medicinal plants/herbal extracts
- Activity guided fractionation and isolation of active compounds from plant materials.
- Pharmacological evaluation of bioactivities from plant and microbial sources for metabolic disorders.
- Functional food and nutraceutical supplements from natural products.

Research activities

- Collaborative research with Ayurvedic industries on key issues related to processing, value addition and validation of health benefits
- Pharmacological validations for metabolic disorders, inflammation and cancer
- Dietary fibre: Process and product development; Efficacy in modulation of gastrointestinal health
- Value addition of underutilized agro-produce (palmyra palm sap and coconut sap)
- Novel synthetic compounds in improved agriculture management
- Antimicrobial evaluation of metabolites/molecules from plants and microbes
- Development of novel bio-fertilisers and bio-pesticides.