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# दि लेदर पोस्ट
# The Leather Post

सीएसआईआर–केन्द्रीय चर्म अनुसंधान संस्थान
CSIR-Central Leather Research Institute

## DG, CSIR at International Yoga Day Event


## INAUGURATION OF PILOT BIO-REFINERY

# Director's Message

## Greetings and Namaskar to the Stakeholders of the leather sector

Dr P Thanikaivelan
Director, CSIR-CLRI

लेदर पोस्ट के प्रिय पाठको,

हमें आपके लिए द लेदर पोस्ट का जून 2026 अंक लाते हुए अपार प्रसन्नता हो रही है। इस महीने की गतिविधियों को स्थिरता, सामाजिक जिम्मेदारी, वैज्ञानिक उत्कृष्टता और संस्थागत आउटरीच के प्रति मजबूत प्रतिबद्धता द्वारा चिह्नित किया गया है। रानीपेट में पायलट बायो–रिफाइनरी प्लांट, रानीटेक का उद्घाटन एक महत्वपूर्ण मील का पत्थर है, जो एक चक्रीय जैव अर्थव्यवस्था दृष्टिकोण के माध्यम से चमड़े के औद्योगिक अवशेषों को मूल्य वर्धित उत्पादों में बदलने के हमारे संकल्प को दर्शाता है। हमारे संस्थान में विश्व पर्यावरण दिवस, विश्व रक्तदाता दिवस और अंतरराष्ट्रीय योग दिवस 2026 का आयोजन किया गया है, जिससे पर्यावरण और सामाजिक कल्याण के प्रति हमारी प्रतिबद्धता और मजबूत हुई है। सीएसआईआर के महानिदेशक की राष्ट्रीय महासागर प्रौद्योगिकी संस्थान (एनआईओटी), चेन्नई में आयोजित अंतरराष्ट्रीय योग दिवस समारोह में भागीदारी ने शारीरिक, मानसिक और भावनात्मक कल्याण को बढ़ावा देने की हमारी प्रतिबद्धता पर प्रकाश डाला है। वैज्ञानिक सेमिनार, सुरक्षा जागरूकता कार्यक्रम, एलएलपीआईआरडीसी, इथियोपिया के साथ एसएमईपी ग्रीन टेनरी पहल की समापन कार्यशाला और हमारे क्षेत्रीय केंद्रों के क्रियाकलाप विज्ञान, समाज और उद्योग के साथ सीएलआरआई की जीवंत भागीदारी को दर्शाते हैं।

Greetings!

We are delighted to bring you the June 2026 issue of *The Leather Post*. The activities in this month have been marked by a strong commitment to sustainability, societal responsibility, scientific excellence and institutional outreach. The inauguration of the Pilot Bio-Refinery plant at RANITEC, Ranipet, is a significant milestone, demonstrating our resolve to transform leather industrial residues into value-added products through a circular bio economy approach. Our observance of World Environment Day, World Blood Donor Day and International Day of Yoga 2026 further strengthened our commitment to environmental and societal well-being. The participation of the DG, CSIR, for the International Yoga Day Celebrations at the National Institute of Ocean Technology (NIOT), Chennai, highlighted our commitment to promoting physical, mental, and emotional well-being. Science seminars, safety awareness programs, the closing workshop of SMEP Green Tannery Initiative with LLPIRDC, Ethiopia, and activities at our Regional Centres further reflect CLRI's vibrant engagement with science, society and industry.

# Hairy-tale start to A Fairy-tale finish: Keratin recovery in tanneries

Tanneries generate roughly 40 kilotons of animal hair waste annually. This waste, rich in keratin protein (90–95%), is typically landfilled. Conventional keratin extraction methods (reduction, alkaline hydrolysis, oxidation) suffer from poor yields (20–45%), structural degradation, and toxic by-products. At this juncture, scientists at CSIR-CLRI combine two approaches — ionic liquid [BMIM]Cl as solvent and acoustic cavitation (ultrasonic probe at 20 kHz) — to dissolve sheep hair waste and extract native-form keratin.

- Solid-to-liquid ratio: 1:40 was optimal, balancing yield and IL consumption
- Irradiation time: 30 minutes was sufficient; beyond this, only marginal gains
- Acoustic power: 450 W was optimal; 600 W caused keratin degradation via excessive heating

A pre-soak in 2% thioglycolic acid (a mild reducing agent) disrupted disulfide bonds, boosting yield to 75.1% from 71%.

**Key Results**

- Keratin yield: 71% (native form, structurally intact)
- Processing time reduced by 95% (from 10 h to 0.5 h) from conventional methods
- Specific energy input: 39.5 × $10^3$ kJ/kg vs. 702.4 × $10^3$ kJ/kg conventionally

**IL Recovery & Reuse**

[BMIM]Cl was recovered at ~77% efficiency and reused over five cycles with only marginal decline in extraction yield (71% -> 67.2%), demonstrating circular solvent use.

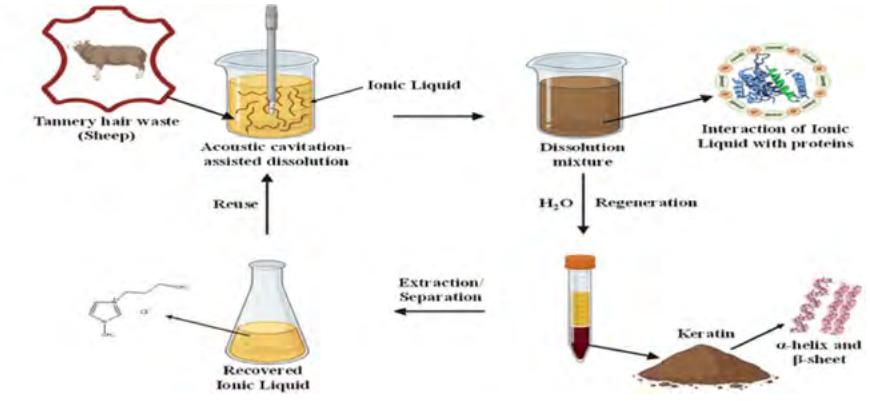
**Significance**

Prior IL and sonication work was almost entirely on wool and feathers. Tannery hair waste — which is chemically different (lime-sulphide processed, partially degraded, contaminated) — had not been systematically targeted. This matters because it connects the method directly to an industrial waste stream rather than a clean laboratory substrate. Getting 71% native-form keratin (not hydrolysate) from a real waste stream is a meaningful number. Most native keratin yields from IL methods hovered around 10–29%. The combination of [BMIM]Cl + acoustic cavitation + thioglycolic acid pre-soak working synergistically on tannery hair is the novel process design. This work addresses a real industrial waste stream from leather processing using a greener, faster, and structurally preserving extraction route. The recovered keratin — with >90% protein purity and good thermal stability — holds promise for biomedical applications, while the process itself supports circular economy principles within the tannery sector. Its primary contribution is applying an established IL-sonication strategy to an underexplored but industrially important feedstock and demonstrating meaningfully better yields with structural preservation. For the leather science community, the tannery waste origin is the most differentiating aspect! For the broader keratin science community, the yield and processing time numbers are the headline!

**Prasath Veerana Loganathan, Nitin Prakash Lobo, Surianarayanan Mahadevan Lajapathi Rai Chockalingam**

Sustainable Valorization of Tannery Hair Waste into Keratin by an Acoustic Cavitation Process with Ionic Liquid

**Waste and Biomass Valorization, Springer Nature** (2026)
https://doi.org/10.1007/s12649-026-03627-7



# Simulating Mineralocorticoid Receptor–Spironolactone Binding: The Significance of Hydrophobic Groove

Mineralocorticoids are a class of steroid hormones produced by the adrenal glands. Aldosterone, the primary mineralocorticoid, plays a crucial role in regulating the body's electrolyte balance. Aldosterone increases the retention of sodium and water and promotes the excretion of potassium by the kidneys. The mineralocorticoid acts through the mineralocorticoid receptor (MR) to mediate sodium transport and regulate potassium and hydrogen ion homeostasis. Hence, the mineralocorticoid receptor (MR) is a key component of the Renin–Angiotensin–Aldosterone System (RAAS) to regulate blood pressure, electrolyte balance, and fluid homeostasis. Dysregulation of this receptor is observed in cases of several chronic disorders, including hypertension, heart failure, kidney disease, and metabolic disorders. The drug spironolactone is primarily prescribed for heart failure, hypertension, and edema. It works by antagonizing aldosterone receptors in the distal renal tubules and increases the excretion of sodium and water while retaining potassium, reducing fluid overload and lowering blood pressure.

Researchers at CSIR-CLRI, in collaboration with others, have done a computational investigation into the structural and functional significance of the hydrophobic groove in stabilizing spironolactone binding to the mineralocorticoid receptor. In this study, the crystal structure of the MR–spironolactone complex (PDB ID: 3VHU) was used to generate a series of mutant receptor models through site-directed mutagenesis. Five mutant complexes and one wild-type complex were subjected to long-range molecular dynamics (MD) simulations using the GROMACS simulation package. Binding free energy calculations and statistical analyses were conducted to evaluate the significance of residue contributions to ligand stability. This integrated computational strategy enabled a detailed comparison between wild-type and mutant receptor–ligand interactions.

Results of the simulation study showed that the hydrophobic groove plays a pivotal role in maintaining stable spironolactone binding. While some polar residues contribute to the initial recognition and hydrogen-bond interactions with the ligand, few hydrophobic residues provide sustained stabilization by anchoring the thioacetyl group of spironolactone within the binding pocket.

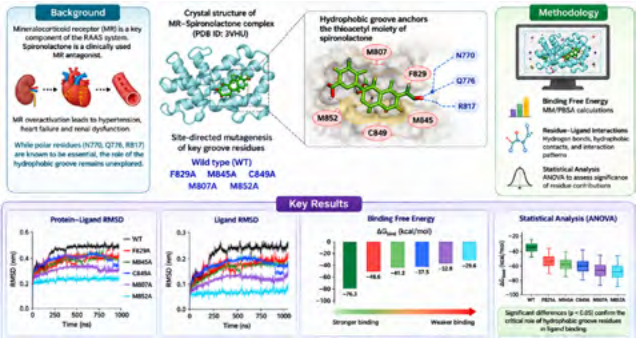
Mutations disrupting these hydrophobic residues altered ligand orientation, increased local structural flexibility, and reduced binding affinity. Even when polar interactions were abolished through mutations, the ligand remained associated with the receptor. This is by adapting its conformation toward the hydrophobic groove, confirming the dominant role of hydrophobic interactions in long-term ligand retention. These findings conclusively established that the hydrophobic groove is not merely a structural feature but a critical determinant of ligand recognition, stability, and receptor inhibition.

The research findings provide insights into MR inhibition and offer valuable structural information for the design of next-generation selective mineralocorticoid receptor antagonists with improved therapeutic efficacy and reduced adverse effects.

**Seshan Gunalan, Kanagasabai Somarathinam, Sekar Kanagaraj, Jaimohan S.M, Gugan Kothandan**

Intriguing the significance of hydrophobic groove by the inhibitory mechanism of mineralocorticoid receptor bound with spironolactone through mutations using long range molecular dynamics simulations in conjunction with statistical analysis

**Journal of Molecular Modelling,** Vo. 32, Art No. 64, 10 February 2026
DOI: https://doi.org/10.1007/s00894-026-06639-1



# Publications from CSIR-CLRI

June 2026

| | |
|---|---|
| 1 | Muruganantham, S; Karmegam, PM; Lakshmikandharasu, JB; Kanchinatham, SBK; Pounsamy, M, Sustainable treatment of pharmaceutical evaporator condensate using a hybrid Fenton-microbial bioreactor with functional carbon catalysts, Journal of the Indian Chemical Society, 2026, 103 (6), 10.1016/j.jics.2026.102600 |
| 2 | Deb, S; Ghosh, S; Sarkar, S; Bose, S; Chatterjee, S; Banerjee, A, C-terminally engineered nucleopeptide-based soft materials exhibiting antibacterial and antifungal efficacy against multi-drug-resistant strains, Organic & Biomolecular Chemistry, 2026, 24 (24), 5189-5199, 10.1039/d6ob00700g |
| 3 | Elanchezhian, C; Sivaganesan, P; Bansal, D; Das, MK; Chaudhuri, S, Metal-Free Construction of Benzazepinoindoles in Water Enabled by an Ion-Pair Superacidic Precatalyst, Chemistry-An Asian Journal, 2026, 21 (11), 10.1002/asia.70820 |
| 4 | Sheyara, RTB; Jayashree, S; Das, I; Lobo, NP; Prasad, M; Swaminathan, V; Velu, N; Samanta, D, A Scalable Biobased Leatherlike Material via the Covalent Integration of Kombucha-Derived Bacterial Cellulose and Polyurethane, Industrial & Engineering Chemistry Research, 2026, 65 (24), 12635-12651, 10.1021/acs.iecr.6c00524 |
| 5 | Bansal, D; Sivaganesan, P; Elanchezhian, C; Das, MK; Chaudhuri, S, Diverse Activation Modes for Ring Opening Reactions of Donor-Acceptor Cyclopropanes, Chemistry-An Asian Journal, 2026, 21 (12), 10.1002/asia.70844 |
| 6 | Paitandi, RP; Giri, M; Koyae, R; Nobuoka, M; Tsutsui, Y; Shuku, Y; Koo, YH; Li, ZW; Sakurai, Y; Suzuki, K; LÃ³pez-Cabrelles, J; Furukawa, S; Kaji, H; Suda, M; Ghosh, S; Seki, S, Direct Construction of Magnetic and Electrical Two-Dimensional Radical Covalent Organic Frameworks, Nature Communications, 2026, 17 (1), 10.1038/s41467-026-74618-4 |
| 7 | Singh, F, Mechanotherapeutic biomaterials: Overcoming physical barriers to enhance intratumoral drug delivery in solid tumours, Biomedical Microdevices, 2026, 28 (3), 10.1007/s10544-026-00832-y |
| 8 | Venkitesan, AC; Muthulakshmi, YP; Lobo, NP; Raja, NK; Balamurugan, K; Fathima, NN, Synergistic effects of glycerol on the hydration dynamics and rheological properties of collagen, Biophysical Chemistry, 2026, 333, 10.1016/j.bpc.2026.107600 |

## Technology Transferred from April 2026

| S. No. | Technology Transferred |
|---|---|
| 1 | Development of Castor oil-based anionic waterborne polyurethane dispersions for leather finishing applications. |

# Technology Developed

| S. No. | Technology Developed | Year of Development |
|---|---|---|
| 1 | CLI-Mate: A unified digital platform for Carbon footprint assessment for Leather Industry (CLI) and waste treatment systems (ETP/CETP) | 2026-27 |
| 2 | A High Softening Fatliquor with Low Fog Value for Enhanced Leather Properties | 2026-27 |
| 3 | A Sustainable Process for the Valorization of Spent Pickling Acid by Recovering Iron and Chloride as Value-Added Chemicals | 2026-27 |
| 4 | A Binder-Free Process for Recycling Waste Rubber Using Elemental Sulphur and a Solvent | 2026-27 |

# FASHION TREND POOL & MODEUROP

CSIR-CLRI has announced the much-awaited release of the Fashion Trend Pool & ModEurop Colour Cards on 10 June 2026 for the Autumn-Winter 27/28 Season. ModEurop is the official trend fashion platform of the German Shoe Institute. With its ColourCard, ForeCasts, and ColourClubConference, ModEurop offers the design studios of shoe and accessory manufacturers orientation for each season. As a trendsetter and network of experts, they work both for and with the shoe industry and offer a wide variety of services. They also bring trends and culture surrounding shoes, bags and accessories to the general public. The Fashion Trend Pool is a network of footwear and fashion experts with a common vision, with a tag line, "*We inspire you today with the trends of the day after tomorrow*".

To avail the Colour Card, please contact the Director, CSIR-CLRI at director.clri@csir.res.in & spdc.clri@csir.res.in.

# CATERS Column

This is a monthly informative feature in *The Leather Post,* designed to keep stakeholders in the leather and footwear industry up to date on critical quality standards. This feature will highlight upcoming regulations, updates on restricted substances, and region-specific compliance requirements. Stay ahead, be prepared, and be compliant to ensure your business meets evolving industry standards.

## FIFA World Cup and Footwear

Football boots have undergone significant research and development over the years. Starting with non-studded footwear in 1863, the design evolved with the introduction of studs and bars in 1891, followed by boots featuring replaceable nails in 1924. By the 1990s, the focus shifted to performance-enhancing surface engineering. Adidas launched the Predator, which incorporated rubberized elements in the upper part of the boot. Meanwhile, PUMA introduced foam-free midsoles to reduce weight, and Nike developed air cushioning systems. By 2007, the use of carbon fiber helped bring the weight of boots down to just 190 grams per pair. In 2014, Adidas released Primeknit, which featured a knitted upper made from water-resistant yarn. By 2019, football footwear included embedded devices for motion capture and pressure mapping, enabling personalized designs tailored to player style and position. Today, features such as adaptive lacing, internal support cages, and elastic collars have made footwear feel like a second skin. The future of football boots appears to be in connected technologies combined with a focus on sustainability. ***(For more information, refer to the SATRA Bulletin, June 2026 issue).***

## Recycled Material in Footwear

A recycled material is defined as one that has been reprocessed from reclaimed sources through a manufacturing process, resulting in a final product or a component that can be incorporated into another product (ISO 14021:2016). These materials can originate from either pre-consumer or post-consumer waste.

It's important to note that simply reworking or grinding scrap generated during the production process does not qualify as recycling. However, waste that is mechanically shredded, melted and remoulded without altering its chemical structure, or subjected to a chemical process that breaks down polymers into their constituent monomers to create new polymers, is considered recycling. For instance, plastic bottles that are recycled into polyester for footwear and recycled nylon are examples of mechanical and chemical recycling.

Another emerging method is thermochemical recycling, in which waste is converted into fuel or energy feedstocks. It's crucial to keep in mind that mechanical or chemical recycling processes may introduce substances that are subject to REACH regulations. Additionally, a Life Cycle Assessment (LCA) is necessary to evaluate the energy and water use, and the carbon footprint associated with recycling.

## How Can We Help?

Please email your questions or doubts regarding various regulations, test methods, test report interpretations etc., to

caters.clri@csir.res.in

# WORLD Environment Day celebrations

CSIR-CLRI celebrated World Environment Day on 5 June 2026. To mark the occasion, the Institute organised a tree plantation at the CLRI Campus, Chennai. Further, awareness activities were organised on the theme for the year 2026, '*Inspired by Nature. For Climate. For our Future'*

Dr P Thanikaivelan, Director, CSIR-CLRI, and staff members participated in the event and planted saplings at the CSIR-CLRI Campus.


On the occasion of World Blood Donor Day, Dr P Thanikaivelan, Director, CSIR-CLRI, administered a pledge to the staff and scholars of CSIR-CLRI on 12 June 2026 with the following aim:

- Commit to regular blood donation
- Raise awareness about the need for voluntary, unpaid blood donation
- Promote solidarity, compassion, and civic responsibility
- Ensure that blood shortages do not result in preventable deaths

World Blood Donor Day is celebrated annually on 14 June to honour the selfless contributions of voluntary blood donors whose donations save millions of lives and strengthen public health systems. Spearheaded by the World Health Organisation (WHO), this year's campaign theme is "*One Drop of Humanity. Give Blood. Save Lives*", placing humanity at the heart of every blood donation.

## Blood Donation Camp at CSIR-CLRI

To mark World Blood Donor Day 2026, a Blood Donation Camp was organised on 16 June 2026 in association with Voluntary Health Services (VHS) Blood Centre, Taramani, Chennai.

Staff members, researchers, and students came forward and donated blood. Through their selfless act of donating blood, the donors have made a noble contribution that brings hope, saves precious lives, and strengthens the spirit of compassion and social responsibility.

# International Yoga Day

CSIR-CLRI observed the International Day of Yoga 2026 on 21 June 2026. On this day, the Institute successfully organised "*Yoga Sangam – 2026"*. The programme witnessed enthusiastic participation from CSIR-CLRI staff members, researchers and students, highlighting the importance of yoga in promoting physical fitness, mental well-being, stress management, and a healthy lifestyle. Further, the event provided an opportunity for everyone to practice yoga together and reaffirm the commitment towards adopting yoga as an integral part of daily life.

The International Day of Yoga (IDY), celebrated globally every year on 21st June, is inspired by India's adoption of the proposal at the United Nations General Assembly in December 2014. Since its first observance in 2015, the International Day of Yoga (IDY) has evolved into one of the world's largest participatory wellness movements. The 2026 edition, themed '*Yoga for Healthy Ageing*'(स्वस्थ आयु के लिए योग), carries this journey forward through nationwide participation, innovative initiatives and year-round engagement, while promoting preventive healthcare and active living.

The Core Objectives are:

- Promote the practice of Yoga as a tool for healthy ageing and lifelong wellness.
- Encourage citizens to adopt Yoga as part of their daily lifestyle.
- Create awareness about preventive healthcare through Yoga.
- Showcase India's rich Yoga heritage and its global relevance.
- Strengthen community participation under the FIT INDIA Movement.

# DG, CSIR at International Yoga Day Celebrations

A week-long series of yoga session was organized by National Institute of Ocean Technology (NIOT), Chennai, which culminated on 21 June 2026 with a special programe.

CSIR-CLRI, along with other organizations like CSIR-Structural Engineering Research Centre (CSIR-SERC), CSIR Madras Complex (CMC), Indian Meteorological Department (IMD), and National Centre for Coastal Research (NCCR), participated in the event.

More than 130 staff members from these organizations actively participated in the celebrations and performed yoga with a spirit of collaboration and collective commitment. Addressing the participants of the program, Dr (Mrs.) N Kalaiselvi emphasized the importance of yoga for the scientific community and highlighted its role in promoting physical, mental, and emotional well-being. Dr. KJ Sreeram, Scientist H and Shri KM Sridhar, Sr. Controller of Administration

represented CSIR-CLRI in the yoga session. Dr (Mrs.) N Anandavalli, Director, CSIR-SERC also participated in the event.

Speaking on the occasion, Prof. Balaji Ramakrishnan, Director, NIOT, highlighted the significance of yoga in promoting healthy ageing and encouraged participants to adopt yoga as an integral part of their daily lives for achieving holistic well-being.


# CSIR–CLRI Receives "YOGA SANGAM PATRA" from Ministry of Ayush

CSIR-CLRI is honoured with the "*Yoga Sangam Patra*" from the Ministry of Ayush, Gov India, in recognition for successfully organising the Yoga Sangam Event to commemorate the International Day of Yoga 2026. The event was organized on 21 June 2026 and witnessed enthusiastic participation from CSIR–CLRI staff, promoting the message of Yoga for health, harmony, and holistic well-being.

The recognition reflects CSIR-CLRI's commitment towards encouraging a healthy lifestyle and contributing to the nationwide movement to promote Yoga.



## Science Seminar at CSIR-CLRI

CSIR–CLRI, Chennai, organized a Science Seminar on 24 June 2026, as part of the effort to promote scientific excellence, knowledge exchange, and collaborative research among scientists, faculty members, and research scholars. Dr P. Yuvaraj, Scientist-E, CSIR–North East Institute of Science and Technology (CSIR-NEIST), Jorhat, spoke on the topic "*Design and Synthesis of Organic Fluorophore Molecules for Applications in OLEDs*," In his talk, Dr Yuvaraj presented his research group's recent findings in the development of novel organic fluorophore molecules for next-generation organic light-emitting diode (OLED) technologies. He spoke on the innovative molecular design strategies and efficient synthetic methodologies for constructing highly luminescent organic materials with desirable photophysical properties. He emphasized environmentally benign and sustainable synthetic approaches that offer excellent atom economy, broad functional group compatibility, and high synthetic efficiency.


While elaborating on the relationship between molecular structure and optical performance, the speaker illustrated how rational molecular engineering can significantly influence emission characteristics, stability, and device efficiency. The importance of mechanistic understanding in reaction development, recent advances in catalytic synthetic methodologies, and their broader implications for the preparation of functional organic materials relevant to optoelectronic devices.

# INAUGURATION OF PILOT BIO-REFINERY

Dr P Thanikaivelan, Director, CSIR-CLRI, on 15 June 2026, inaugurated the pilot Biorefinery Plant at the Common Effluent Treatment Plant (RANITEC) at Ranipet, Tamil Nadu. The pilot plant has the capacity for the sequential production of bio-diesel, bio-ethanol, bio-hydrogen and bio-methane using tannery fleshing waste. Jointly funded by the Ministry of Environment, Forests and Climate Change & RANITEC Company Pvt Ltd., the pilot plant has the capacity for the sequential production of bio-diesel, bio-ethanol, bio-hydrogen and bio-methane using tannery fleshing waste.

The inauguration was presided over by Dr Mecca Rafeeque Ahmed, President, AISHTMA, Shri Malack Abdul Wahab, Regional Chairman (South) – CLE, Shri Ramesh Prasad, Chairman, RANITEC, Shri A Sahasranaman IAS (Rtd), Hon. Advisor, CEMCOT, Dr B Chandrasekaran, Former Director, Distinguished Scientist, CSIR-CLRI. Stakeholders of the Leather Industry were also present on the occasion. This pilot plant is developed by Dr P. Shanmugam, Scientist – G and Group Leader, Environmental Engineering and Sciences, CSIR – CLRI.

This technology was demonstrated for 2 tons per day of tannery fleshing waste for the sequential production of 150 Liters of Bio-Diesel, 80 Liters of Bio-Ethanol, 80 m3/day of Bio-Hydrogen and 100m3/day of Bio-Methane.

Finally, the bio- methane residue is filtered using a filter press and becomes agricultural manure. The bio-methane (90%) and bio-hydrogen (10%) are blended together as BIO-HYTHANE and fed into the gas generator, which produces electricity. Using this electricity, the bio-hydrogen and bio-methane plant Stirrer and mincer are operated. The produced Bio-diesel used today as B20 was tested in our RANITECH Tractor, and Bio- Ethenol (E20) as E to P was fed into a two-wheeler, driven successfully in the presence of Director CLRI and other 80 leather industry owners and dignitaries.


The filtered digestate made as cake becomes an agricultural manure, and the filtrate goes to CETP for treatment, leading to a new first-time concept of ZERO SOLID DISCHARGE (ZSD) for fleshing wastes at maximised Circular economy and carbon neutrality, aiming to achieve Zero carbon emission in the near future.

This sequential bio-fuel production technology can also be extended to Municipal organic solid waste, used cooking oils, slaughterhouse solid waste, kitchen waste, fruit waste, and vegetable waste with minor modifications.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# SAFETY AWARENESS PROGRAMME

CSIR-CLRI organized a Safety Awareness Programme in association with SINGAPEN (Special Task Force, Government of Tamil Nadu) on 19 June 2026 at the Triple Helix Auditorium, CLRI Campus, Chennai.

The programme aimed at creating awareness among staff and students on the importance of safety, preparedness, and responsible practices in daily life and workplace environments.

The interactive session provided valuable insights on safety measures and encouraged participants to adopt a proactive approach towards ensuring a safe and secure environment.

Launched on 9 June 2026 in Tamil Nadu, the Purpose and Mandate of the SSTF is designed to strengthen law enforcement efforts against crimes targeting women and children.

Preventive policing and surveillance in vulnerable areas:

- Rapid response to complaints and emergencies
- Deployment in high-risk public spaces, including bus stands, railway stations, educational institutions, IT corridors, and commercial zones
- Victim assistance, including rescue operations and coordination with social welfare and education departments
- Cybercrime focus, with personnel from the Cyber Crime Wing addressing online harassment and digital threats
- Public awareness campaigns and inter-agency collaboration with NGOs and government departments


# SMEP Green Tannery Initiative by CSIR-CLRI and LLPIRDC, *Ethiopia*

CSIR-CLRI and the Leather and Leather Products Industry Research and Development Center (LLPIRDC), Ethiopia, on 25 June 2026, organised the closing workshop of the SMEP Green Tannery Initiative on "*Achieving Sustainable Development in Leather Manufacturing in Africa*" at Addis Ababa, Ethiopia.
The workshop was graced by H.E. Anil Kumar Rai, Ambassador of India to Ethiopia and Permanent Representative to the African Union, as the Guest of Honour, and H.E. Tarekegn Bululta, State Minister, Ministry of Industry, Ethiopia, as the Chief Guest.

The workshop brought together stakeholders from government, industry, development partners, regional organisations, research institutions and academia to discuss cleaner leather manufacturing technologies, policy support, sustainability priorities and regional adoption pathways. More than 75 participants attended physically, while 40+ participants joined virtually, reflecting strong regional interest in advancing sustainable, circular and cleaner leather manufacturing in Africa.

**The programme highlighted the major outcomes of the SMEP project:**

- enzymatic unhairing as a cleaner alternative to conventional sulphide-lime unhairing and
- conversion of tannery solid wastes such as hair and fleshings into value-added fertilizer/organic input applications.

These interventions were appreciated by stakeholders. ELICO Tannery shared their experience and interest in taking forward enzymatic unhairing for commercial adoption.




# TRIBUTE

## Prof. Y. Nayudamma's 41st Death Anniversary

CSIR-CLRI on 23 June 2026 paid rich tribute to Prof Y Nayudamma on the occasion of his 41st Death anniversary. Prof Y Nayudamma is a legendary scientist, visionary leader, and pioneer of Indian leather research. He has made remarkable contributions that continue to inspire scientists, technocrats, entrepreneurs, and rural innovators across the nation. Through his visionary leadership, CSIR-CLRI emerged as a global centre of excellence in leather science and technology.

Prof. Nayudamma believed that science must serve society. His efforts in taking scientific innovations to the grassroots transformed the lives of rural communities and empowered countless artisans and entrepreneurs. His legacy of innovation, inclusivity, and service to the nation continues to guide us towards a future where science drives sustainable development.

Remembering such a true visionary with transformative ideas and actions will continue to inspire generations of researchers.

On the occasion of World Environment Day, CLRI Regional Centre, Jalandhar, organised a plantation drive on 5 June 2026 at the Institute. The Scientist-in-Charge of the Regional Centre, staff and researchers planted saplings at the campus.

## International Day of Yoga Celebration

On the occasion of the 12th International Day of Yoga, with the theme '*Yoga for Healthy Ageing*', a yoga session was held on 21 June 2026, for the staff, students, and supporting staff at the Regional Centre, Jalandhar.

# Upgradation of Leather Used in Musical Instruments

A Demonstration-cum-Training Program on the Upgradation of Leather Used in Musical Instruments was organized at Dindigul on 29-30 June 2026. Artisanal communities from Tamil Nadu and Keralam participated in the program. In this initiative, artisans were connected with commercial tanneries in Dindigul to facilitate sustainable sourcing of raw materials, thereby strengthening the value chain and supporting the long-term growth of the artisanal sector.

# Activities at Regional Centre, Kolkata

## CSIR SMART Village initiative

As part of the CSIR SMART Village initiative, the CSIR CLRI team conducted an initial needs assessment survey at Janakpur Village, Madhya Pradesh, on 11 June 2026. The CSIR-CLRI team also engaged with the CSIR-Advanced Materials and Processes Research Institute (CSIR-AMPRI), Bhopal, on the "*Smart Village*" project to explore a possible joint effort aimed at uplifting the socio economic status of the local population of Janakpur Village.


# Activities at CLRI Regional Centre, Kanpur

World Environment Day was celebrated at the CLRI Regional Centre, Kanpur on 5 June 2026. The staff and scholars planted saplings at the Institute to mark the occasion.

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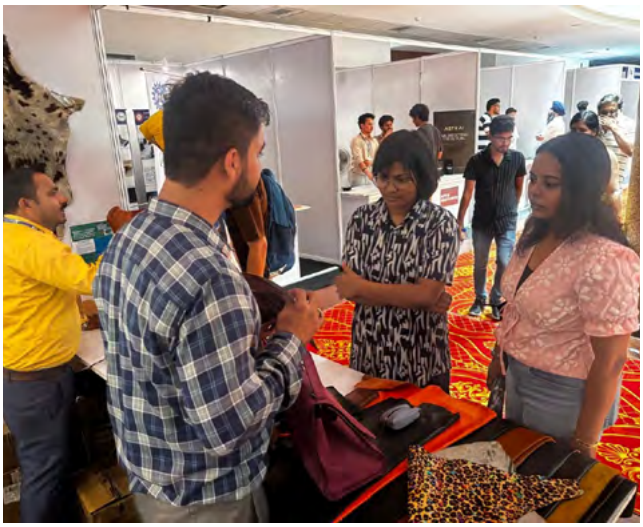
**For Feedback and Comments: Editor, The Leather Post; email: chandrag@clri.res.in**

# Inspection of Grossly Polluting Industries

CSIR-CLRI participated in the '*Annual inspection of Grossly Polluting Industries'* project funded by National Mission for Clean Ganga (NMCG) and coordinated by the Central Pollution Control Board (CPCB) on 1 June, 2026.CSIR-CLRI, as the nodal agency for the Tannery sector, also participated in the concluding meeting on 30 May 2026, under the chairmanship of the DG, NMCG, and presented the outcomes of the project.


## Industry - Academia Conclave at Dr B. R. Ambedkar National Institute of Technology, Jalandhar, Punjab

CLRI Regional Centre, Jalandhar, participated in the Industry - Academia Conclave organized by Dr. B. R. Ambedkar National Institute of Technology, Jalandhar, Punjab, on 5-6 June, 2026. The scientific and technical staff actively interacted with students, industry experts, and faculty members. They showcased various leather technologies, leather chemicals, and leather products, while also highlighting the academic programmes and career opportunities offered by the Institute.

# Visit of Joint Secretary, DPIIT, *Govt. of India*

Ms. Nidhi Kesarwani, Joint Secretary, Department for Promotion of Industry and Internal Trade (DPIIT), Government of India, visited Chennai and Ranipet on 8–9 June 2026. An interaction meeting with stakeholders and representatives of the Leather and Footwear Industry was held on 9 June 2026 at the Footwear Design & Development Institute (FDDI), Chennai, under the chairpersonship of Ms Nidhi Kesarwani. Mr. M. Sundaresan, Executive Director, FDDI, Chennai, welcomed the dignitaries.

Mr. RV Chari, Chairman, Confederation of Indian Industry (CII), Chennai, thanked DPIIT for organizing the event at Chennai for the benefit of leather and other industries and shared the common concerns of industries. Dr. P. Thanikaivelan, Director CSIR-CLRI, emphasized the importance of developments in the leather sector, policy priorities, innovation-driven growth, and emerging investment opportunities. He highlighted the need for stronger industry–government collaboration to enhance the competitiveness, sustainability, and global positioning of the Indian leather and footwear sector. Shri Bhuvnesh Pratap Singh, Director (Start-up India), DPIIT, highlighted the strengthening of the ecosystem for start-up

entrepreneurs and fostering innovation-driven growth for industries.

Subsequently, the participants raised their concerns and the financial support required in the leather and other industrial sectors. Ms. Nidhi Kesarwani, Joint Secretary, DPIIT replied that the issues of the industries would be considered and addressed in future programs.

# JOINT SECRETARY, DPIIT VISITS CETP RANIPET

Ms Nidhi Kesarwani, Joint Secretary, DPIIT, visited RANITEC CETP, Ranipet, on 8 June 2026 and observed the progress of work at the site on the upgradation of the RANITEC CETP Project, including the salt purification plant under the STEP scheme of DPIIT. During the visit, she commissioned the 'Emission Control system in DG sets', implemented under the upgradation project. The CSIR-CLRI team, the Project Monitoring Consultant (PMC) for the RANITEC CETP Project, was also present during the DPIIT team's visit.


# DIRECTOR, CSIR-CLRI VISITS L&T WATER TECHNOLOGY CENTRE, KANCHIPURAM

Dr P. Thanikaivelan, Director, CSIR-CLRI and Dr S. V. Srinivasan, Scientist - G & Head, Environmental Engineering Department, visited L&T Water Technology Centre, Kanchipuram, on 15 June 2026

During their visit to various facilities at the centre, the Director held detailed discussions with Dr Vijay, Head - WTC, Dr P. Ganesh Kumar, Senior Deputy General Manager (R&D), Dr D. Karunanidhi, Deputy General Manager (Labs) and Mr Akshansh Gupta, Senior Engineer (Environmental) about various activities of the Centre. Further, possible project collaboration in the field of tannery wastewater treatment and monitoring to achieve sustainability was also explored.

# FISHERIES STAFF TRAINING INSTITUTE, GOVT. OF TAMIL NADU, CHENNAI

About 11 trainee Inspectors of Fisheries from the Fisheries Staff Training Institute, Department of Fisheries and Fishermen Welfare, Government of Tamil Nadu, Chennai, visited CSIR-CLRI on 4 June 2026.

During the visit, the trainees gained knowledge about the development of smart leather from fish skin. Scientists explained the processing steps involved in converting underutilised marine and freshwater fish skins into value-added leather products and showcased various products developed from these resources.

The trainees also visited the facilities related to environmental management, wastewater treatment, and the pyrolysis plant at the Institute.

## Science Outreach Programme for School Students

As part of a science outreach programme, 6 Class 9 students, accompanied by a teacher from Bala Vidya Mandir School, Chennai, Tamil Nadu, visited CSIR-CLRI on 18 June 2026. The visit aimed to provide the students with an opportunity to explore the Institute's ongoing research programmes and to cultivate an early interest in scientific research. The students were introduced to the science behind leather processing and other associated research activities. The students visited various laboratories at the institute, including Biotechnology and Environmental Engineering.

## Team Symbionic visits CSIR-CLRI

CSIR-CLRI on 19 June 2026, hosted representatives from Symbionic, a startup working on advanced upper-limb prosthetic solutions. Founded by Rishi Krishna and Niranjan Kumar, Symbionic focuses on developing modular prosthetic devices that improve functionality, independence, and quality of life for users. During the visit, the team interacted with CSIR-CLRI scientists and technical experts to understand footwear manufacturing technologies, material selection, product development processes, and advanced materials used in the footwear sector. During the discussions, the team explored the possibility of collaboration on polymeric, textile, cushioning, and structural materials, and their application in prosthetic and assistive device development. The visit served as a valuable platform for knowledge exchange and opened up opportunities for future collaboration in materials science, product design, and human-centric engineering, reinforcing CSIR-CLRI commitment to supporting innovation for inclusive societal development.

# The National QUALITY CONCLAVE 2026

The National Quality Conclave 2026 – Gunvatta Yatra, was organized by the Quality Council of India (QCI) in association with CSIR-CLRI and the Indian Leather Products Association (ILPA) on 24 June 2026 at Freya Hall, ILPA, Calcutta Leather Complex.

The conclave brought together industry leaders, MSMEs, quality professionals, entrepreneurs, and stakeholders from the leather sector to discuss the importance of quality, competitiveness, sustainability, and continuous improvement in achieving global excellence.

Valuable insights into the ZED (Zero Defect Zero Effect) Certification Scheme, Lean Manufacturing Certification Schemes, and the importance of NABL-accredited testing in enhancing product quality and market competitiveness were discussed at the event.

Dr. M. Sathish, Scientist, CSIR-CLRI Regional Centre, Kolkata, delivered a keynote address highlighting various initiatives of CSIR-CLRI in the areas of quality assurance, testing services, certification support, and technology-driven solutions for the leather and leather products industry.



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Scientist G
Chemical Engineering Unit

**Smt. Mahalakshmi K**
FAO, Administration – Finance & Accounts Section

**Shri Srikanth S,**
PTO
Chemical Engineering Unit

**Smt. Vijayalakshmi N**
PTO
CATERS

***The Director and Staff wish them a happy and healthy retired life***

# CSIR-Central Leather Research Institute

**(CSIR Integrated Skill Initiative Training Programme)**

## CSIR-CLRI announces the commencement of the following placement oriented courses

### Leather Processing

- Post Graduate Diploma Programme in Leather Technology
- Diploma in Leather Processing
- Short Term Executive Skill Development Programme in Leather Processing
- Integrated Skill Development on Quality Control Methods in Leather Manufacture
- Computerized colour Matching for Leather manufacturing

### Leather and Leather products

- Post Graduate Diploma Programme in Leather Products Technology
- Quality and Visual Inspection of Leather and Leather Products
- Skill Training Programme in Leather and Leather-like materials for Emerging Entrepreneurs
- Short Term Executive Skill Development Programme in Leather Upholstery Manufacture
- Course in Fashion Design and Development for Leather Lifestyle Products

### Leather Goods and Garments

- Diploma in Leather Goods Manufacture
- Short Term Executive Skill Development Programme in Leather Goods Manufacture
- Training Programme in Leather Goods Design (Manual and CAD)
- Diploma in Leather Garment Manufacture
- Short Term Executive Skill Development Programme in Leather Garments manufacture
- CAD for Garments

### Allied Science courses

- Bioinformatics Associate/ Analyst
- Quality Control Chemist – Microbiology
- QA Chemist Equipment Validation - Life Sciences
- Nuclear Magnetic Resonance (NMR) Spectroscopy Analyst
- Quality Assurance Chemist
- Leather Biotechnologist
- Enzyme Technologist
- Structural Analytical Technologist
- rDNA Technologist

### Leather Allied Sectors

- Short Term Executive Training Programme on Occupational Health and Safety for Leather and Allied (Product) Industries
- Short Term Executive Training Programme on Testing and Calibration for Leather Sector
- Repair, restore and maintenance of leather products
- Short Term Executive Training Programme on Waste Management for

### Footwear

- Diploma in Footwear Manufacture
- Short Term Executive Skill Development Programme in Footwear manufacture
- Training programme in GAIT Analysis
- CAD for Footwear

Please visit https://clri.org/training.aspx for online / offline submission of duly filled in application

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**For more info:**

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