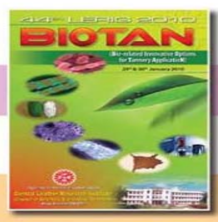
44th Leather Research Industry Get-Together (LERIG)

Bio-related Innovative Options for Tannery ApplicatioN

(BIOTAN)

LERIG 2010

29th & 30th January 2010



Technical Session	Sponsors
I (Biology of collagen, Bio - preservation, Bio - processing)	Meenakashi enterprises
II A (Environmental Biotechnology)	Biopore
II B (Bio-based option for solid waste management)	SGS, S.B. International
III (Biomechanics/ Biocomposites)	Millenium Exports
Views Forum	Shafeeq Shameel & Co.

Organized by

CENTRAL LEATHER RESEARCH INSTITUTE

(Council of Scientific & Industrial Research)

in association with

AISHTMA,CLE,IFLMEA,ILGA, ILPA, ILTA,ITPO, ISF, LCDA,LCMA,TALTEIA,ALFA

PRESS NOTE

VENUE FOR PRESS MEET – B.M. DAS HALL

DAY & DATE – THURSDAY, 28TH JANUARY, 2010

TIME : 11.30 HRS.

Introduction

Central Leather Research Institute, one of the constituent National Laboratories under the aegis of the Council of Scientific and Industrial Research (CSIR), Government of India, started its journey in 1948 with a mandate to seek excellence in leather science and technology. The Institute, fondly known as CLRI in the leather world, has, since its inception, been providing critical and crucial technological support to leather and allied sectors. The Institute, today, has emerged as a centre of excellence in the sector.

CLRI has been playing a pivotal role in developing the Indian leather sector through appropriate technologies, manpower training and recommending suitable policy support through Government agencies. It has been a dependable source for technological as well as human resources in leather and allied sector.

LERIG – an Industry centric approach

Industry-Institute cooperation has been the keyword for CLRI in enabling sustained growth for the Indian leather industry. An initiative was made in this Institute around mid-sixties to provide a platform for the stakeholders to discuss and deliberate on the ideas and concerns of common interest. The sector has considered it an initiative worth expanding and adding new values. Thus, a get-together of CLRI and industry emerged to be an annual feature of the Indian leather sector as Tanners Get-Together and the event became popular as TGT. CLRI organizes the annual event during the last week of the month of January with the support of all the stakeholders of the sector. All industrial associations own and fund the program. TGT has been rechristened as Leather Research Industry Get-together (LERIG) during 1980s, that witnessed a thrust in export of value added products.

The event has been providing a unique platform for the industry and research institutions to deliberate on various issues and challenges associated with the leather sector. The programme is structured in such a way that provides opportunities to arrive at the preparative strategies in meeting the challenges of the leather sector. The meet has gained national and global visibility. Today, LERIG is an international calendar event for the leather sector and marks the beginning of the leather week celebration, that ends with India International Leather Fair (IILF), organized by India Trade Promotion Organization at Chennai. The whole leather sector looks forward to this annual event to address the immediate and long term concerns, priorities and opportunities of the leather and allied sectors.

LERIG 2010

It is the 44^{th} time the annual get-together, LERIG, is being organized by CLRI for the leather sector. LERIG 2010 is scheduled to be organized in CLRI during January 29-30, 2010.

In view of the raising alertness on the environmental issues throughout the world, eco-benign options are the need of the hour for the survival of the Leather industry, especially the tannery applications, which are otherwise conventionally known source of immense pollution due to the use of several hazardous chemicals. It is essential for the Leather sector to strive for attaining better preparedness to face the environmental challenges. Research initiatives in CLRI have led to a conviction that the problem may effectively be addressed through eco-benign biological options. It becomes much easier, because of the fact that leather itself is a biological material. Considering the shifting of

global leather manufacturing base to the developing nations, it is an opportunity for this country to gain leadership through bio-based technological interventions.
Thus, the thematic title for LERIG 2010 has appropriately been chosen as 'Bio-related Innovative Options for Tannery ApplicatioN (BIOTAN). It is pertinent to mention here that the acronym 'BIOTAN' also reminds us of the bio-based tanning agent. LERIG 2010 has been planned with the present theme, *i.e.* BIOTAN to focus on the following topics:

- Biology of collagen, Bio-preservation and Bio-processing
- Environmental Biotechnology
- Bio-based options for Solid waste management
- Biomechanics and Bio-alternatives for Leather Products

Meeting Media/Press

It has been an annual practice for the leather sector to introspect itself just prior to LERIG to have a latest update on the status of the leather and allied sector in respect of trade, market and knowledge power. This facilitates making appropriate plans for addressing the relevant issues relating to the sector with a Team India spirit.
There has been immense contribution of CLRI in generating significant bio-based eco-benign leads for leather processing. This Institute has been playing a leading role in ensuring a paradigm shift in leather processing from chemical based to bio-based options. In this context, 'Meeting Pres/Media' prior to LERIG 2010 strives to focus on the sustainable knowledge leads/expertise available in CLRI in this realm with an objective of evolving appropriate public-private partnership for the overall benefit of the leather sector.

An outline of the proposed sessions during LERIG 2010

B.M. Das Memorial Lecture

LERIG 2010 is scheduled to start on Friday, the 29th January, 2010 with the oration in the honour of Prof. B.M. Das, the father of Indian leather industry and the first Director of CLRI. Dr. Heinz Peter Germann, Director, LGR, Reutlingen, Germany, delivers the prestigious B.M. Das Memorial lecture on 'Sustainable Leather Manufacture- Realistic objective or wishful thinking?' The session is chaired by Dr. G Thyagarajan, Former Director, CLRI.

Inaugural function

This is followed by the formal inauguration of LERIG 2010 by Dr. V Prakash, Director, Central Food Technological Research Institute, Mysore. Dr. KV Raghavan, Chairman, CLRI Research Council, presides over this inaugural session. Dr. G Thyagarajan, Former Director, CLRI, Mr. Rafeeque Ahmed, President, AISHTMA, Mr. Habib Hussain, Chairman, CLE and Mr. Taj Alam, Director, Kings International are the Guests of honour for the session. MODEUROP awards and Design awards are to be presented during this session. The inaugural session is followed by four technical sessions. International experts from both India and abroad are set to deliberate on different challenging issues.

Technical Sessions

Technical session I is planned to cover the following three major issues relating to the topic on 'Biology of collagen, bio-preservation and bio-processing' :

- New perceptions in understanding biological issues related to leather and application of biophysics tools.

- Bio-preservation technologies for minimizing pollution
- Microbiological and biotechnological aspect related to leather processing.

Dr. Niaz Ahmed, Director, Presidency Kid Leather chairs the session, which is scheduled to have four speakers.

Technical session IIA is scheduled to start on 30th January, 2010 morning to deliberate on the following two major issues relating to the topic on 'Environmental Biotechnology' :

- Application of environmental biotechnology to improve end-of-pipe treatment.
- Odour control in tanneries

Three speakers are scheduled to deliberate during the session, which is to be chaired by Dr. M Mariappan.

This session is to be followed by the Technical Session IIB, which is to deliberate on the following two issues relating to the topic 'Bio-based options for Solid waste management':

- Solid waste utilization and management technologies for value added products.
- Biodegradation of leather and life cycle analysis for leather products

There are three speakers for this session, which is to be chaired by Dr. KV Raghavan.

Post-lunch session on the 30th January 2010 is the Technical session III, that addresses the following three major issues relating to the topic 'Biomechanics and Bio-alternatives for Leather Products':

- Value addition and property enhancement for leather and leather products through biological alternatives.
- Biomechanics in footwear and leather products
- Biological issues related to REACH compliance

Six speakers are scheduled to address the issues during the session, which is to be chaired by Mr. PV Gopalakrishnan Bachi, President, Indian Shoe Federation.

This session is scheduled to be followed by 'Views Forum'. Representatives from both CLRI and industry are scheduled to deliberate in this Forum, which is to be chaired by Dr. KV Raghavan.

Concluding Session

LERIG 2010 closes with the valedictory session, slotted on 30th January 2009 evening. Dr. Germann is the chief guest for this session.

Summary of Achievements during 2009 - at a glance

The year 2009 has witnessed several accomplishments for CLRI in several ways including providing leads and translating the same for industrial application as well as extension. The R&D achievements in different areas have been multifold. There have been several accolades for CLRI through the recognition of the contributions made in different spheres.

Bio-intervention in Leather Processing

Environmental issues have been gaining much focus consistently in the research priorities in CLRI. Pioneering efforts have been made to ensure a paradigm shift in leather processing from chemical base to bio-processing. Effective leads have been obtained in respect of eco-benign preservation, enzyme led leather processing, bio-based tanning system and process engineering that involves reduction of volume of waste water discharged from tanneries through suitable water management and recycling measures.

Hazardous Sulfide gives way to Enzymatic option in dehairing

A series of proteases has been developed from different microbial sources under In-house as well as NMITLI (New Millennium Indian Technology Leadership Initiative) programmes and the application of the enzymes has been explored for the purpose of dehairing of hides & skins to replace hazardous sulfide and lime either partially or even completely. This enzymatic intervention has also resulted in the substantial reduction of pollution load in terms of BOD, COD and TDS in the effluent.

Enzymatically unhaired
Goat skin

Pickle free system for Chrome tanning

A pickle free high exhaust chrome tanning system for skins field-tested. The process completely eliminates the use of common salt thereby minimizing the chloride level significantly in sectional waste stream. The process also enables higher exhaustion of chromium used for tanning. A tanners' association of North Arcot Dist. has evinced interest in implementing this technology in some of its member tanneries.

Chrome free tanning system

Many chrome free tanning systems have been developed for the production of upper, garments and gloving leathers. Suitable post tanning operation has been evolved to improve affinity for post tanning chemicals/auxiliaries.

Zero Emission Research Initiative

Water recycle and reuse method based on zero waste water discharge from beam house and tanning operation has been developed on semi-commercial scale. A pilot scale facility has been created at CLRI on public-private partnership mode for the demonstration of the technologies to industry. A scheme for achieving zero waste water discharge in post tanning operation has ben developed at pilot scale and the techno-economic viability is being studied.

Commissioning of ZLD based CETP

Three ZLD (Zero Liquid Discharge) based CETPs (Common Effluent Treatment Plants) of capacity upto 4000 m^3 per day are to be commissioned shortly in Ambur and Vaniyambadi leather clusters. This will certainly ensure that no wastewater is discharged into the river Palar, thereby improving the ground water quality of the area and also the water quality of the Palar river.

It has been established that the reuse of water recovered from treated waste water using R.O. (Reverse Osmosis) in post tanning operation has a potential for saving post tanning chemicals in leather making.

SLF for Tanneries

Decentralized Secure Landfill Facility (SLF) systems have been commissioned at Ranipet, SIDCO (Phase I), Melvisharam,Ambur, Vaniyambadi and Pernambut CETPs for capacities ranging from 5000 to 1,15,000 m^3 with financial assistance from the Ministry of Commerce & Industry under ASIDE and Cluster Development schemes.

CETP at Jalandhar Leather Complex

CETP Jalandhar Leather complex is under construction and the same will be commissioned by middle of this year. Once this plant is commissioned 5 MLD of wastewater will be treated to meet Punjab Pollution Control Board standards.

Material innovation - Newer Frontiers

Natural fibre based materials from a variety of sources such as pine apple leaf fabric, banana fabric, soya fabric, endi and muga silks have been evaluated for their potential to fabricate consumer products. It has been established that a judicious combination of these alternate natural materials with leather forms a promising matrix, which finds potential application in fabricating a range of consumer products. Public-private partnership model is being explored to ensure further innovation and product development.

Products made from banana, endi and muga fabric in combination with leather

Newer Frontier in Health Care Products

❖ *DIASTEP: an “off the shelf” footwear for low risk diabetics*

Collaborative work among CLRI, M/s Diabetic Research Centre, Chennai and M/s Novo Nordisk Education Foundation, Bangalore has resulted in the development of a novel diabetic footwear. The technology has successfully been transferred to M/s MV Diabetic Health Care Pvt. Ltd. Chennai. The product was launched during November 2009 and is being marketed as DIASTEP.

DIASTEP is a therapeutic open footwear for the diabetic patients with risk of foot problems such that the footwear reduces the abnormal distribution of plantar foot pressure. Also this footwear provides the patients with diabetic foot risk, complete open footwear, comprising selective topsole, insole and bottom sole made of appropriately selected material.

The therapeutic footwear has a cow softy leather upper, a unit moulded sole made from Polyurethane (PU) with extra depth to provide larger area for more effective pressure distribution and outsole having special tread for better grip and traction. Extensive patient trials have established the efficacy of the footwear.

❖ *Leads for diabetes treatment*

Considering the increasing prevalence of diabetes at an alarming rate, sustained efforts are being made in CLRI to find alternate user friendly solutions for the treatment of diabetes. New leads relating to the use of plant sources for the treatment of diabetes has been established. It has also been proved that formulation of drug in the form of nanoparticle not only reduces the dose as well as frequency of offer of the drug to a patient, but also obviates the conventional limitations *e.g.* usual side effects associated with the drug.

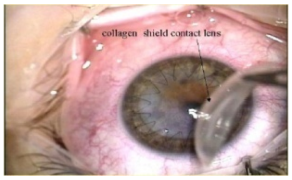
❖ *Leads towards Wound care products*

CLRI has built core strength in collagen based wound care products and a range of products has been developed in this direction. Some of these products are already adequately proven in the market. Now a newer direction in the product range has been provided by this Institute by developing a porous keratin scaffold from horn meal, whereby the product exhibits good cell viability and renders it suitable for wound healing as well as tissue engineering applications.

❖ *Collagen Research – new direction*

Solid atelopeptide collagen from bovine tendon was prepared by microbial extraction process. *In vitro* and *in vivo* studies reveal that the biocompatible fibers could be woven as a fleece to get a three-dimensional scaffold with good mechanical strength, not offered by soluble collagen preparations, suitable for tissue engineering applications, particularly as a cardiac patch.

The Institute has provided significant leads towards new biomaterials for ophthalmic applications. The clinical evaluation of succinylated collagen punctal plugs (SCPP) in the treatment of dry eye syndrome (DES) was studied in 10 eyes of 6 patients. The results showed that the plugs can be effectively used before and after punctal occlusion with SCPP.



REACH compliance

CLRI has developed procedures for REACH (Registration, Evaluation, Authorization and Restriction of Chemicals) compliance testing. A database indicating potential cause and origin for REACH restricted substances for leather sector has been compiled. A microwave assisted procedure for extraction of restricted substances has been developed, which is capable of minimizing solvent usage for testing by more than 80%.

Fashion forecasting for leather

Leather has emerged as a fashion product. Travel of INDIA in ‘fashion forecasting’ for leather is an initiative to bring to the fore the ability of the Indian Leather Industry to take pro-active measures in fashion forecasting and design development by providing a scientific leather product development focus in the areas of colour forecasting, range building, design and retail analysis.

MODEUROP, an International Institution founded by the prominent institutions of the global leather and footwear industry, forecasts fashion and trends in Leathers, Colours and Materials for the International market, three seasons ahead. Getting one Indian colour into the MODEUROP Colour Card in 1994 was a matter of prestige. Today, India has almost 50 – 70% of the colours chosen, featuring from Indian proposals.

CLRI plays the role of a ‘design interpreter’ catalyzing the growth of the leather and leather products sector by motivating the members of the Indian Leather Fraternity to stay ahead of fashion in LEATHER. TODAY, Tanners in INDIA are developing the new range of leathers/ colours within days of CLRI producing the MODEUROP Colour card and reaching out to Buyers not only abroad but also to the discerning product manufacturers in the country.

The MODEUROP Roundtable for the Spring Summer 2011 season was held during 26-27 November 2009 in Offenbach, Germany.
Colours from INDIA: 532 leather/ colour proposals from 21 Tanners/ Chemical companies were presented from INDIA and the Indian presentation was titled “Plurality of Colours from INDIA.”

Winning Colours: 27 out of a total of 37 colours selected as 'MODEUROP' feature are from INDIA. It includes 16 out of 24 colours for SHOES & 11 out of 13 colours for Leather Garments.
The Colour card was released to the Members of the Industry on 30 December 2009.
The challenge and opportunity today is to capitalize on the winning colours and translate them into fashion products.

HRD Programmes

Several training programmes of varying focus and duration are conducted for the benefit of a wide range of target groups from leather industry. Tailor made training programmes are also undertaken depending on the requests received from the industry. Trainings are also offered to operators / technicians / supervisors in CETPs, ETP and tanneries for operation and maintenance of treatment system and chrome recovery system.

Industry linkage

Strong linkage with industry has been the cornerstone for the activities undertaken at CLRI. While the exiting bond has been strengthened, newer linkages have been established during the year 2009. This has been amply demonstrated by the externally projects undertaken, technical services rendered and technologies transferred. The Institute has also organized several information dissemination programmes in different parts of the country for the benefit of the industry. Collaboration at both National as well as International level has helped in image building in respect of the capabilities of CLRI.

Recently, an international Agreement has been signed with the Government of Ethiopia in connection with undertaking a consultancy project relating to rendering technical expertise for enhancing the efficiency as well as effectiveness of selected seven export oriented tanning units in Ethiopia. This is an opportunity to demonstrate the capability of the Institute on a global platform.

Transfer of know-how

Conscious efforts are made to transfer the technological leads/Know-how to the user industry for commercial exploitation.
Two licensing Agreements have been signed during the year 2009 in respect of the transfer of technology to the following clients:

Sl.	Know-how	Patent application no.	Licensee
1	FACCO (Fenton Activated Carbon Catalytic Oxidation) system for removal of refractory organics in waste water	314Del2004	Tamil Nadu Newsprint and Papers Limited, Chennai (TNPL)
2	FACCO (Fenton Activated Carbon Catalytic Oxidation) system for treatment of waste water	314Del2004	Vapi Waste & Effluent Management Co. Ltd., Gujrat

Completion of Technology Transfer

The year 2009 has also witnessed the completion of transfer process of a total of eight technologies to the industrial clients in India and abroad.

❖ Transfer of Technology in India

Two technologies, as indicated below, have successfully been transferred to two clients in India.

Sl	Technology	Client
1	Reconstituted Collagen Sheet for sustained release of Silver Sulphadizine	M/s Eucare Pharmaceuticals, Chennai
2	Diabetic footwear	M/s. M.V. Diabetes Health Care, Chennai

❖ Transfer of Technologies to Foreign Company

It has been a landmark event for CLRI to have successfully transferred Know-how relating to six wound care products (Collagen Membrane (Native), Collagen Membrane (Reconstituted), Collagen Sponge (Reconstituted), Collagen Sponge, Fibrogel, Bone Implant) to M/s Bio-collagen Technologies SDN Bhd., Malaysia. The transfer process, which was initiated during the year 2008, has successfully been completed during the year 2009. The Know-how has been demonstrated to the authorized representatives of the company at CLRI.

Formal hand over of *Know-how document*

Necessary training has been imparted to the representatives of the company. Consolidated Know-how document has also been provided. The company has expressed satisfaction on the know-how transfer. It plans to manufacture and market the above wound care products in Malaysia in the near future.

Network Initiatives

CLRI under the network programme of CSIR, has been making sustained efforts not only to consolidate on leads gained by the Institute for technology standardization of bioresources for and from leather, but also to provide viable technology solutions towards compliance of TDS norms and management of wastes generated from the processing sector.

CLRI in National Planning

Two major schemes, as indicated below, were launched by the Govt of India during the Tenth Plan towards reaching out to the unreached segments of the leather sector.

- Integrated Development of Leather Sector (IDLS)
- Infrastructure Strengthening of Leather Sector (ISLS)

The Programme Implementation Unit (PIU) for Tannery Modernization under the IDLS scheme operates at CLRI, which is the nodal agency for this purpose. The scheme has been extended even to eleventh plan period. As of now, the IDLS scheme pertaining to tanning segment has been able to enroll 594 tanneries. The applicant tanners are largely from the four states – Tamil Nadu, West Bengal, Uttar Pradesh and Punjab.

CLRI coordinated HRD Mission, Global Benchmarking and Non Leather Footwear Sector programmes under the ISLS scheme. Some of the major initiatives under the HRD Mission include cluster based training activities, support to training institutions, women centred programmes and training programmes for the organized sector.1.31 Lakh people connected directly and indirectly to the leather sector have been reached through the HRD Mission programme.

Support has been provided under the Global Benchmarking scheme for quality certification, environmental and social audits. CLRI has been directly involved in benchmarking studies for the tanning sector as well as footwear sector.

Looking Ahead

Efforts focusing at bio-mediated approaches in leather processing have led to technological breakthroughs on a global platform. However, they involve significant changes in processing concept. The bio-based materials as well as their application conditions require to be fine tuned to address the requirements of the different end products. It necessitates appropriate Public-Private-Partnership model to prove the technological leads at a credible scale for further commercial exploitation.

LERIG 2010 strives to offer a sound platform towards the attainment of this.