

Our Mission

To conduct innovative R&D and provide internationally competitive Technical services to accelerate industrial development for the benefit of the people of Sri Lanka

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Using Glass Waste Embedded Clear Polymer for Decorative Purposes

Very small portion of used glass, usually colourless glass, is recycled in many countries including Sri Lanka and in some countries waste glass is used as concrete aggregate and sometimes for landscaping. In Sri Lanka, however the major portion of used glass, especially coloured glass, does not meet the strict selection criteria used for recycling and causes many environmental problems.

Having identified the gravity of the environmental problem caused by the waste glass, the researchers at the Materials Technology Section (MTS) of the ITI attempted to utilize pieces of waste glass and clear polymer to fabricate various decorative products. Up to 80% of cleaned, crushed, sieved and dried coloured glass waste could be used in this process depending on the required characteristics of the final product. This glass waste mixed with clear resin could be used to fabricate bathroom cubicles, windows and doors,

various frames such as mirror frames, paper weights, tables, reception desks, wall cubicles, wall separators, trays, pencil, pen holders, key tags, vases *etc.*

This glass waste embedded polymer is fragile and similar to other plastics, but has a look of coloured crystals. At the moment MTS researchers are carrying out further studies to evaluate the thermal properties, weather resistance, abrasion resistance and colour stabilization which are necessary before mass scale production.

As reported this is the first study in the world on embedding glass pieces in clear polymer. Instead of glass even gold dust or synthetic flowers could be embedded in clear polymer to give more attractive look.

Value addition to waste material is one way

out of the problem. Implementation of this process will add value to the waste glass and also would be a profitable venture. Most favorable feature of this process is the ability use glass of any colour which is rated very low when it comes to recycling. Low prices of the main raw materials, *i.e.* glass and clear polymer make the production of glass embedded clear polymer ornaments a highly profitable industry.

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Some Products

Workshop on Spice Grinding

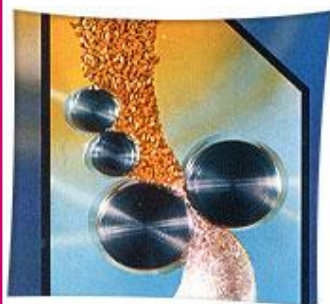
Sri Lanka has been synonymous with spices from the historic times and has been using spices for culinary purposes from the time unknown. Until very recently Sri Lankan housewives used to prepare spices at home and there was a market for un-processed spices. With the changes in the society that took place in recent times, for cooking most of the housewives started using processed spices available in the market. This is found to be very convenient and a big potential for the processed spices was created. Medium to small scale businesses mushroomed in almost every part of the country and ready-to-use processed and packeted spices flooded the local market under various trade names.

With time the shortcomings of the process and product appeared and various institutions such as ITI, SLSI, NERD Centre *etc.* started working on these problems to ensure the safety of the customers. Even now Food Technology Section (FTS) of the ITI is working on various aspects of spice grinding and on 26th February this year they organized a Workshop to producers of processed spice powders.

The Workshop was very comprehensive in its coverage, i.e. the

workshop gave knowledge on spice grinding, standards pertaining to the raw materials and finished products, equipments, packaging, storage, labeling, good manufacturing practices (GMP) and also a field trip to a spice processing plant.

Mrs. Damitha Rajapakse, a Senior Research Officer of the FTS of the ITI, at the workshop explained the important steps in spice process-



Roll Mills

ing. The lecture included postharvest practices that should be followed to have a quality final product, quality assurance in raw materials, simple quality checks, cleaning methods and structure and the environment conditions of various areas of the processing plant. Research Officer, Mr. Tharaka Gunawardena explained about the processing equipment and Sri Lanka standards pertaining to the spice processing. Dr. (Mrs.) Ilmi Hewajulige's lecture on impor-

tance of food safety and GMP and Mrs. Karuna Aponso's lecture on Packaging and labeling widened the knowledge of the participants on the process and the product. The practical session at ITI included the formulation of a Garam Masala mix which was appreciated by the participants. One of the highlights of the programme was the participation of an expert on grinding machinery to enhance the knowledge of participants in this area.

The participants, mostly the process spice producers, benefited largely from this workshop

in many ways according to the feedback and they were very thankful to the organizers for enlightening them to produce a quality product to the customers and ultimately engage good business practices with high profits.

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Workshop on Moving towards Digital Libraries

“Moving towards digital libraries”, the first workshop on the series “Knowledge sharing seminars and workshops” conducted by the Information Services Center was held on 24th March 2010 at S F Laurentius Building Auditorium. The objectives of organizing this series of workshops are to share the knowledge among the fellow information professionals and also to get to know our community better.

A Digital library is a library in which collections are stored in digital formats and accessible by computers. The digital content may be stored locally, or accessed remotely via computer networks. Modern libraries are moving towards digitization for various reasons beneficial to them such as improved retrieval speeds and better information delivery in the required formats, and as a means of saving space and efficient storage systems.



Group of participants

In a digital environment librarians alone can not handle the work; they need to interact with IT professionals to a great extent, also with publishers, information providers such as indexing and abstracting services. This workshop was carried out to give awareness how to transform traditional libraries to digital environment and related topics. A highly resourceful panel of speakers delivered presentations at the work shop.

Mr. Harrison Perera, former Librarian University of Peradeniya delivered a very informative and interesting presentation on **Concepts and Realities** followed by Ms Suranee Samarasekera, Head, Information Services on **Meeting Challenges of the digital age**. IT experts Dr Ruwan Gamage, University of Moratuwa and Dr Chamath Keppitiyagama University of Colombo presented aspects on **Technology Perspectives of digital libraries**, which was very useful for the librarians who were not so familiar with ICT applications . A presentation on **Retrieval tools for digital environments** was delivered by Ms Purnima Jayasinha followed by a presentation on **Resources and services of the ISC** by Ms Roshani Fernando and Ms Inoka Pieris, all from the ISC.

Eighteen librarians from various Universities and Institutions took part in the workshop which was rated highly and requested for more such workshops to be conducted in the future .

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Workshop in progress

Screening of rice varieties for iron dense endosperm for better human nutrition

Iron and zinc are the micronutrients, which have several vital functions in the body. Most of the iron in the body is present in the haemoglobin, serves as a carrier of oxygen to the tissues from the lungs. Zinc plays a vital role in growth, development and functioning of immune system in humans.

Iron deficiency anaemia is the most prevalent nutritional deficiency amongst the population of Sri Lanka. It is estimated that 1/3 of the population is iron deficient, based on haemoglobin content in blood.

The most vulnerable groups to iron deficient are infants, children, adolescents, women of childbearing age and especially pregnant women. It is mainly caused by low iron content in the diet during rapid body growth and poor absorption of iron from staple cereals. Dietary phytates by forming metal-phytate bonds, contribute to a mineral depletion and deficiency in populations of those who rely on whole grain and legume based products.

Rice is the staple food among Sri Lankans. One of the major nutritional problems is nutritional anaemia, prevalent in rice consuming countries because of inadequate and unbalance dietary intake of iron. Milling removes the most of the iron in the grain. Therefore improving the iron content in rice grain and its bio-availability is a way of combating iron deficiency anaemia in the population. The present study

explains the potential to use rice as a vehicle to upgrade the nutritional status of population.

A sample of forty-two rice varieties, grown in a Complete Randomized Block Design at Bombuwala (iron rich soil) and Batalagoda (iron non-rich soil) during *Yala* and *Maha* season of year 2006 and 2007 were screened in duplicates for stable high iron rice varieties. The results were pooled and analyzed considering the overall variation in two seasons in two locations. The iron content ranged

These samples were acid digested and analyzed for their iron and zinc contents by Inductive Coupled Plasma- Optical Emission Spectroscopy (ICP-OES). Phytate content was determined in eluted fraction from anion exchange column followed by wet digestion and quantification by spectrophotometric technique.

Results indicated that iron and zinc contents in polished rice varieties ranged from 0.23 to 0.47 mg/100g and from 1.2 to 2.9 mg/100g respectively. Phytic acid contents of polished rice varieties ranged from 200 mg/100g to 300 mg/100g.

Although the loss of iron occurs during milling process, some rice varieties have a potential to retain more of its iron content after milling. These varieties are the genetically endospermic iron rich rice varieties. They are the Suduru samba, (0.47 mg/100g), Basmati 370 (0.37 mg/100g), Kalu Heenati (0.42 mg/100g), Rathu Heenati (0.44 mg/100g) and Sudu

Heenati (0.37 mg/100g). Above varieties are better for human consumption to combat iron deficiency.

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from 1.75 mg/100g to 3.23 mg/100g and zinc content ranged from 2.51mg/100g to 3.91 mg/100g. A significant difference ($p < 0.05$) in iron content and zinc content were observed for the variables of variety, location and season. Fifteen high iron rice varieties were selected and polished at a degree of polishing 8 to 10 % by calibrating the Polishing Machine (Model: Satake) with percentage removal of bran to time intervals.