Wednesday the 25th of January 2017

Daily News

Vidya

The Official Newspaper of the Ministry of Science, Technology and Research

Certificate holders that came among the best 10 in scientific research papers

Junior Scientific Sessions Very Successful

The Residential Training Sessions operative under the National Science Foundation was very successfully held at Subodhi Institute, Moratuwa on the last 17th, 18th and 19th for the 09th time. About 70 students from 16 schools participated in this programme. Fifty five research projects were selected by a panel of intellectuals representing universities and other institutions and on the second day of the sessions 10 projects were selected from 29 selected projects. At the end of these scientific sessions with physiological development, intelligence promotion and practical sessions, an awarding of certificates was held under the aegis of the Minister of Science, Technology and Research Susil Premjayantha. This session was conducted by Dr. D. M. Soorathissa, Prof. Jayantha Waththevidana, Rohini De Silva and Thusitha Malalasekera and it is expected to hold the 10th Scientific Sessions relevant to the year 2017 at the end of this year.

Rising enthusiasm for quality scientific research in Sri Lanka,

Through "President's Awards for Scientific Publication"

It is clear that publication of the research outcome of Sri Lankan scientists in Science Citation Index Expanded; SCIE journals, which are highly ranked internationally has been highly increased in recent years. The number of internationally ranked research articles were very minute in older years. In 1995 it was 282, while it was 310 in year 2000. After the inauguration of "President's Awards for Scientific Publication", it became 367 in 2002, 601 in 2003 and surprisingly increased to 1595 by the year 2014.Furthermore, in the 2016-2017 edition of the Global Competitiveness Index released by the World Economic Forum, Sri Lanka has gained the 43rd place out of 138 countries, for the pillar 'Innovation' which one out of the 12 pillars for development. It is the best place won by a South Asian country.There out of 7 sub-pillars, our country has gained higher marks for the sub-pillars of Availability of scientists and engineers, Capacity for innovation and Quality of scientific research institutions. All these reflect that there is an increasing enthusiasm for quality scientific research in Sri Lanka. The recognition and encouragement offered by programs such as "President's Awards for Scientific Publication" seems to be a stimulator for that immense growth.

Applications called for the Private-Public Partnership programme

Applications (Expressions of Interest) are called for the year 2017, under the Private-Public Partnership programme of National Research Council, right now. This will allow any enterprise, registered at the Department of the Registrar of Companies, to address any of their Research and Development needs, through scientific interventions and cut down that research cost by 50%. Research needs of such an enterprise should be discussed with a researcher in a government university or a government research institution, and the application submitted as a joint effort by the two parties; the researcher and the enterprise personnel. Further details and the application is available on the NRC website; www.nrc.gov.lk. There are many successful projects of this type, currently in operation and the application deadline is the 07th April 2017.

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A solution for snakebites

50000 Sri Lankans suffer snake envenomation each year that results in significant morbidity and mortality. Mainstay of management of snake envenomation is administration of snake antivenom as early as possible. Delay in administering antivenom leads to complications such as kidney failure, bleeding in to major organs, respiratory failure and death. Despite, snake envenomation being a major medical problem in Sri Lanka, the country has never had species specific antivenom. Instead Sri Lanka imports antivenom from India which lacks specificity. Further, the Indian snake antivenom is ineffective against the commonest snake envenomation- the hump nosed viper (Getapolanga/Kunakatuwa) envenomation and more importantly it leads to serious side effects in as many as 80% of patients.

A collaborative project between Animal Venom Research International (AVRI), a nonprofit charity from the USA, Instituto Clodomiro Picado of the University of Costa Rica, and the University of Peradeniya has been able to produce a test batch of Sri Lankan species specific antivenom. Instituto Colodomiro Picardo produces antivenom to many South America and African countries and Papua New Guinea. These countries do not face issues that Sri Lankan patients face as their antivenom is superior in quality. Recognizing the need the National Research Council of Sri Lanka provided part of the finding of the project. The rest of the funding came from Animal Venom Research International, a non-profit organization based in USA.

The new whole IgG freeze-dried polyspecificant ivenom was prepared with venoms of Russell's viper (Thithpolanga), saw scaled viper (Walipolanga), hump-nosed viper (Getapolanga /Kunakatuwa), and Cobra (Naya) from Sri Lanka. The necessary permission to collect snakes and house them in a serpentarium, milk venom and export venom to Costa Rica was given by the Department of Wildlife Conservation of Sri Lanka. The research team could not collect enough venom of Common Krait (Thel karawala) due to difficulties arose while collection of venom and thus the test batch does not include antibodies against Common Krait. There is ample evidence that antivenom is ineffective unless given within minutes against Common Krait as the venom binds rapidly and irreversibly to neuromuscular junction. However, it will be included in the commercially available antivenom in the future.

The preclinical neutralizing ability of this antivenom against several toxic and enzymatic activities of these four venoms was analyzed, and compared with that of a batch of VINS antivenom (India) being currently used in Sri Lanka. The new antivenom was more effective than the Indian antivenom in the neutralization of the venoms of Russell's viper (Thithpolanga) and saw scaled viper (Walipolanga), whereas the Indian antivenom showed a higher efficacy against the venom of Cobra (Naya). Regarding hump-nosed viper (Getapolanga /Kunakatuwa), the new antivenom was effective in the neutralization of all activities tested whereas the Indian antivenom was ineffective against most activities tested.

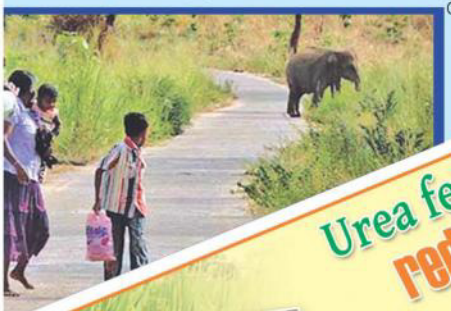
This new polyspecific antivenom is currently being tested in a clinical trial to evaluate its efficacy and safety at teaching Hospital Peradeniya. For the first time in the world, an antivenom has become available for victims of hump-nosed viper (Getapolanga /Kunakatuwa). The initial experience with the antivenom is very encouraging in that there is a visible clinical response that becomes apparent within hours of its administration. The study will soon be extended to other hospitals of Sri Lanka.

The Prime Minister's Official Committee on Economic Management has given official permission to set up a manufacturing plant for the commercial manufacture of the new antivenom in Sri Lanka.

Prof. Indika Gawarammana
Principal Investigator /
NRC Grant TO 14-18
Faculty of Medicine, University of Peradeniya.

Scientific solution for Human-Elephant conflict

Human-elephant conflict is a major issue in the areas of dry zone. Determination of elephant migratory routes using Geo-informatics techniques will pave the path at least to avoid blocking of conventional elephant corridors by the human. To transfer basic skills in the use of GPS and Satellite Remote Sensing, National Research Council conducted an outreach programme titled, "Use of Geo-informatics in Elephant Management" at the National Wildlife Training and Research Center, Giritale. Ranjan Marasinghe, Deputy Director of the Department of Wildlife Conservation, organized the programme as the resource person while target audience was Wardens of National Parks, Regional Directors and many other officials in particular areas. This is an outcome of the project with NRC Grant No: 12-098.



Urea fertilizer cost reduced by 50%

A novel bio-fertilizer was recently developed to reduce urea requirement by 50% in rice. This is a significant outcome from an NRC funded project with Grant No: 11-021, conducted by Prof. T.L.S. Tirimanne and her research group from the University of Colombo. An outreach programme was held at Rice Research and Development Institute (RRDI), Bathalagoda to disseminate this to the farmer community, agricultural extension officers and government representatives. The programme compared rice crops grown with 100% urea fertilizer application and 50% urea application with the bio-fertilizer and gave the experimental proof for the latter to be more successful. The new method is more economical and environment-friendly, than the conventional urea usage.

Our aid to your Surveillance

Activity recognition is an important aspect of a CCTV camera system. For this, analyzing of video feeds from CCTV systems is required but it is a cumbersome task. A workshop was held to disseminate new knowledge on this. Resource personnel were Dr. Ajith Pasqual, Dr. Jayathu Samarawickrama and Dr. Ranga Rodrigo from the University of Moratuwa. Overview of a good CCTV system and things to consider when procuring an effective CCTV system was informed to the audience which consisted of Traffic Police Officers, management personnel at banks and other key organizations where security is a major concern. Explanatory discussions took place to empower the audience with novel surveillance strategies. This is an outcome of the project with NRC Grant No: 12-018.

Higher Technological Methodologies For Promotion of Science and Technology Sphere

International relationships very important to enhance research

With the appointment of Susil Premjayantha as the Minister of Science, Technology and Research, a great revolution happened in the science, technology and research sphere of Sri Lanka. Accordingly, the objective of the Ministry was broadened to constructing an economy based on intelligence. The Prime Minister of Sri Lanka in the keynote address of the Science and Technology in Society Forum (STS Forum) marked that the next forum will be held in Sri Lanka. Accordingly, instructing the Minister of Science, Technology and Susil Premajayantha, arrangements were made to hold that forum in Sri Lanka. Accordingly, the Science and Technology in Society Forum (STS Forum) was held successfully in Sri Lanka on 07th of September 2016.results of it are flooding to the country with scientists and researchers of various countries and in the country gathering to work shoulder to shoulder with us to disseminate the knowledge of science and technology with this country.

In this way, the Science and Technology in Society Forum held successfully in Sri Lanka last year inheriting several international experiences to us was a future investment for us.

In using science, technology and research for the service of the society, the most important sphere was utilizing high technology for the promotion of the health sphere.

Several factors such as manufacturing new medicine using research, manufacturing new medicines using indigenous knowledge, finding solutions to minimize problems regarding diseases ad using the knowledge of local and foreign scientists to rescue lives destroyed by the lack of medicine were successfully integrated in to the health sphere. The most important factor is the ability to reclaim the science, technology and research knowledge of Sri Lankan scientists who have left the country. Minister of Health Rajitha Senarathne, Cardiologist Dr. Bandula Wije, Dr. Gothabhaya Ranasinghe and Prof. Vijira Dissanayake are in the forefront of promoting the knowledge of science and technology for society.

What is specialized is using turmeric, used as a beauty aid and breast cancer treatment made with nano-technology is to be utilized to be researched in the Cancer Institute, Maharagame. The world has reached such a level that after depositing data and pre-cognitions about poisonous things to the body based on data stored in i-cloud, any doctor anywhere in the world can prescribe medicine for any condition. The Intention of the Ministry of Science, Technology and Research is bringing that technology to Sri Lanka with the association of intellectuals of every field. Recently, a special invitation was received from the Government of Iran with special importance to the field of science and technology. Giving space to the Sri Lankan delegates from the Ministry of Science, Technology and Research who witnessed the massive development Iran had achieved in the field of petroleum technology to broaden the relationship and establish such higher technological methodologies in Sri Lanka. Accordingly, the agreement to establishing a mineral oil and lubricant oil in Sri Lanka in collaboration with ITI Sri Lanka is the most immense victory we have achieved here. It was agreed to get the direct intervention and technical assistance from Iran. The Ministry of Science, Technology and Research is doing its maximum to the utilization of higher technology.

> In this way, the Science and Technology in Society Forum held successfully in Sri Lanka last year inheriting several international experiences to us was a future investment for us. In using science, technology and research for the service of the society, the most important sphere was utilizing high technology for the promotion of the health sphere.

Pramitha Randali Pabasara

From Junior Scientific Sessions

Children Science Programme

Prof. Arees Kovoor

Prof. Eric Karunanayake

National Research Council 1999 to 2017

Milestones of a determined journey

Vision

Enable Sri Lanka to achieve Science and Knowledge based developed country status.

Mission

To promote, fund, facilitate and monitor fundamental and applied research and enhance human resource development for Sri Lanka to achieve Science and knowledge based developed country status.

It is clear that Man's eternal desire to explore new knowledge and to have new experiences, has led us to the modern satellite age from the pre-historic ages. Science and Technology earns an utmost importance in the journey we have come so far as a human society. As the great Sri Lankan literate Kumaratunga Munidasa once stated, "The nation which doesn't produce novel inventions - won't become successful in the world" it is clearly pointed out that nations which are lacking behind for Science and Technology, have gone backward in the global context. National Research Council (NRC) was started in the year 1999 with the aim to support the Government in planning, co-ordination and facilitating scientific research of our scientists, to build up a vibrant scientific community in order to promote Science and Technology within the country. It was a result of a concept by Prof. Arees Kovoor, the first chairman of the NRC and the world renowned scientist Arthur C. Clarke, which came to a reality with the inauguration by the President then, Her Excellency Chandrika Bandaranayake Kumaranatunga. There were twelve members in the first Council of NRC. Marking its humble beginning, the office of NRC was located at the ground floor of a small building in Sarana Road, off Baudhaloka Mawatha, Colombo 07. The initial staff was only two members. From then to year 2007, funding for Investigator driven research and implementation of President's awards (for Scientific publication) program became significant in the work of NRC. During this time the first amendment of the Council was decreed. Prof. Eric H. Karunanayake was appointed as the Chairman, while 15 other experts were appointed as Council members.

In the 24th July 2007, the NRC was upgraded into a specialized agency under the Presidential Secretariat by the President then, His Excellency Mahinda Rajapakse with the powers rested upon him by the Act no. 33 of the Sri Lankan constitution. The second amendment to the Council was announced then and 15 members were appointed for the period, 2007-2013. During this time the number of research projects funded by the NRC increased significantly due to the fact that the Government being able to invest in Research and Development more, with the end of the armed conflict. Furthermore, the NRC was able to enter into a new arena of research funding with the budget proposal 2012, which suggested tax concessions to private sector entrepreneurs who actively engage in utilization of research facilities in government / public institutions for their research and technical needs. This was the foundation for inauguration of the NRC's Public-Private Partnership (PPP) programme. Funding under this PPP programme, started from the year 2013 and the NRC has joined hands with number of national entrepreneurs for research related to several innovations aimed at commercialization.

The year 2013 was another important year for the NRC due to the following events; third amendment of the Council and appointment of a new chairman. The new board of Council was appointed by H.E. the President then and it consisted of 17 Council members. The new Chairman appointed was Prof. Janaka de Silva. With the increase of the number of NRC funded research grants, number of cadre was gradually increased and by then the office has been shifted to a new spacious premises which was also located at the Sarana Road.

By the year 2014, the NRC introduced an entirely new research grant scheme aimed at the thrust areas of National Research and Development Framework (NRDF) developed by the NASTEC; National Science and Technology Commission under the Ministry of Technology and Research then. It was the Target Oriented Multi-Disciplinary Research Grants programme (TO). By this programme, different groups of scientists from multiple disciplines are expected to work together to address extremely important national issues, and come up with sustainable scientific solutions. This is the programme which grants the highest amount of funds to any single project at NRC. Currently there are eight TO projects in successful operation.

The year 2016 is an unforgettable one to the National Research Council because it became an established statutory body by a Parliament act of the Democratic Socialist Republic of Sri Lanka, during that year. With the valued contribution of His Excellency the President Maithripala Sirisena, Minister of Science, Technology and Research; Hon. Susil Premajayantha, State Minister of Science, Technology and Research; Hon. Lakshman Senevirathna and the courageous effort by Prof. Janaka de Silva, the NRC was officially established by the Act No.11/2016 of Sri Lankan constitution on the 27th July 2016. For this achievement it should be remembered, the praiseworthy contribution of all former chairmen, Council members and the Executive Secretary Mrs. Manisha Rajapakse, who has been serving since the very beginning of the NRC.

The inaugural board of Council after the establishment as a statutory body, was appointed by the Hon. Minister of Science, Technology and Research on the 30th August 2016 as for the regulations of the Act No.11/2016. Prof. Janaka de Silva was appointed as the Chairman while eleven other members have been appointed to the Council. At the moment the NRC successfully continues its journey encouraging science and technology personnel towards nationally important scientific research while being instrumental in assuring virtuous performance in financial management and administration related to scientific affairs.

SERVICES OF NRC

1. Research Promotion

Science and Technology related research by investigators with local affiliation will be funded by NRC on a competitive basis considering research proposals submitted by them at the times of application calling. This is one of the main services of NRC and the aim is to fund only the best research projects. Accordingly, there are 3 programmes operated by the NRC;

Investigator Driven Grants Programme (IDG)

One principal investigator / scientist, with or without co-investigators will be allowed to carry out research for 1-3 years, under this programme. Maximum amount of funds for such a project will be Rs.5 million.

Public-Private Partnership Programme (PPP)

Here, a scientist from a government institution will direct his research effort to create an innovation to fulfil a technical need of a private entrepreneur or a commercial entity. Funding will be, 50% from the NRC (on behalf of the Government) and 50% from the private sector. Research results must be suitable for commercialization and there is no maximum budget limit for PPP projects.

Target-Oriented Multidisciplinary Research Grants Programme (TO)

In TO programme, a principal investigator, a deputy principal investigator and a group of scientists representing different academic fields will work together to address burning national issues, to come up with sustainable scientific solutions. Maximum amount funded for a TO project will be Rs.50 million and the project duration will be 5 years.

2. Recognition of Local Scientists

A successful research always results one or several good publication as acknowledging the society on the output, is a part of the research success itself. Publication of research results in internationally recognized journals is a confirmation of research success to the global audience. Paving path for such efforts to be known and appreciated by the public is a national responsibility and it is fulfilled by the NRC with the programme 'President's Awards for Scientific Publication". The mission of the programme is to assess and recognize the contribution of our scientists for publications in high-ranked journals in the Science Citation Index expanded. This could be considered as the most prestigious award for a scientific publication bestowed by the first person of Sri Lanka in par with the above program there is a Merit Award program too, by which recognition is done on the noteworthy publications yet not selected for the President's Award, in the particular year of concern.

3. Dissemination of Research Results

Some parts of our society still have an unfamiliar and impractical sense of feeling towards scientific research and the scientific community. To change this ideology, we need to emphasize that science and technology is here for the public's own benefit. For that we need to acknowledge and explain the common society about the research findings and the way they affect our country, our society and our day-to-day life. To disseminate the above knowledge to the public, NRC implements its Outreach Programme on various scientific fields. This programme sometimes seems welfare in nature meanwhile being a stimulator attracting the young generation towards science and technology.

Note
A.S.R. Nonis / Nadeeka Disanayaka
Naduni Wanniarachchi / Supun Katugampala
Dilushi Perera

It is our duty to provide scientific solutions for national issues

Freedom of thought is vital for original and innovative research to flourish, and scientists cherish this freedom. While there can be no disagreement on this, in developing countries maximum use should be made of internal skills and resources, unnecessary duplication should be avoided and, although there should be a culture of tolerating failure which is always a risk when undertaking original research, every effort should be made to prevent wasted effort. For this reason, third world scientists should learn to adapt, prioritize and collaborate so that their research is in areas where maximum economic and social benefits can be derived.

Prof. Janaka de Silva
Chairman
National Research Council

The National Research and Development Framework has identified priority areas of research which are of direct national relevance, and where breakthroughs would bring about a significant impact nationally. The National Research Council takes serious note of the NRDF when prioritizing funding for research. In 2014 it was decided that a significant proportion of NRC funding would be allocated for "target-oriented multi-disciplinary research projects". These projects,conducted by multi-disciplinary teams of scientists, are aimed at solving nationally-relevant issues targeting the economic development, social welfare and environmental sustainability of the country.

We have so far selected eight such projects for funding; they are – improving dairy industry to achieve self-sufficiency in milk, developing a polyvalent anti-venom for snake bite, community mobilization and integrated vector management for control of dengue, an interdisciplinary study on chronic kidney disease of uncertain aetiology (CKDu) in the north central region,ensuring food security through developing climate smart agriculture techniques, developing a model treatment facility for remediation of total dissolved solids and fluoride in groundwater, development of eco-friendly technologies to minimize synthetic agro-chemicals and inorganic fertilizer usage, and development of advanced materials based filters for water purification.

These are all on nationally-relevant issues and were chosen from among the ten focus areas identified in the National Research and Development Framework on which research and development interventions are immediately needed.

Vidya

Seeking hidden gold in Sea cucumber industry

Sea cucumbers are bottom living marine creatures and around 650 sea cucumber species have been identified in various parts of the world. Habitually, they tend to live on the sea floor in coastal and deep sea areas. The catching of sea cucumbers is one of the oldest activities of commercial fisheries in Asian and Pacific countries. Sea cucumbers are traditionally consumed as raw and dried products and the body wall which consists of collagen and mucopolysaccharides is considered as the major edible part. Since sea cucumbers autolyze rapidly after taking out of sea water, it is difficult to preserve and transport. Therefore, more than 80% of fresh sea cucumbers harvested all over the world are usually processed into a dried product known as "bêche-de-mer", which is one of the luxury food items necessary in Chinese festive dishes. Sea cucumbers also play an important ecological role in marine ecosystem as suspension feeders, detritivores and prey. In addition, sea cucumber fishing and trading is imperative for many rural coastal communities, as the main source of income.

The sea cucumber fishery was introduced to Sri Lanka by the Chinese and bêche-de-mer reported to be one of the major commodities taken to China for centuries. As in many other coastal fisheries of Sri Lanka, the sea cucumber fishery is primarily artisanal but provides significant contribution to the livelihoods of coastal fishing communities in the north, east and northwest coasts Around 20 sea cucumber species are commercially exploited in the coastal waters of Sri Lanka through skin and SCUBA diving and more than 10,000 fishing families are currently depend on this fishery. However, decline of commercial sea cucumber populations has been reported in many coastal areas due to overexploitation and lack of proper management measures.

Although the sea cucumber fishery has been practiced for several centuries, there is no tradition of consuming sea cucumbers in Sri Lanka and the entire harvest is processed as bêche-de-mer and exported to Singapore, Taiwan and China. The sea cucumber exports in Sri Lanka peaked between 1995 and 1997 producing nearly 300 metric tons (worth about US$ 3 million), followed by a drastic drop to almost half of this volume during the period from 2000 to 2003. However, restarting of temporarily forbidden fishing activities in the northern coast due to civil war has resulted in increased production and 260 metric tons of bêche-de-mer that is worth about US$ 10.4 million has been exported in 2013.

The market demand for bêche-de-mer mainly fluctuates with species and product quality which is mainly governed by size, shape, appearance, colour, odour, packing and moisture content. Commercially, bêche-de-mer is graded into different categories based on the product quality Postharvest processing techniques have major influence on product quality and any setback in this process may have adverse impacts on the value of bêche-de-mer.

Sea cucumber processors in Sri Lanka are still following the same or a somewhat modified processing techniques introduced by the Chinese in late 1800's to produce bêche-de-mer. In Sri Lanka, the largest portion of exploited sea cucumbers is processed domestically while the rest is processed at large scale processing plants established in the north and northwest coasts.

In many cases local processors use very simple methods and cheap materials which enhance the processing time considerably leading high level of postharvest losses. Further, poor processing such as improper cut, undercooked or overcooked products, improperly salted and dried products are also common in locally processed bêche-de-mer. As such, considerable portion of Sri Lankan sea cucumber harvests is processed as sub-standard products and enter to international trade as low value items causing remarkable economic losses for both fishermen and exporters.

As a result of poor postharvest processing techniques, Sri Lanka is currently losing considerable amount of foreign income which can be easily generated from the bêche-de-mer industry. To address these issues, Dr. Chamari

Since sea cucumbers autolyze rapidly after taking out of sea water, it is difficult to preserve and transport. Therefore, more than 80% of fresh sea cucumbers harvested all over the world are usually processed into a dried product known as "bêche-de-mer", which is one of the luxury food items necessary in Chinese festive dishes.

Dissanayake, Senior Lecturer attached to the Department of Zoology, University of Sri Jayewardenepura started a research project in 2015 aiming to increase the value of sea cucumber harvests by improving postharvest processing and marketing. This research is financially supported by National Research Council and collaboratively carried out with the Department of Agriculture Economics, University of Peradeniya and Department of Aquaculture and Fisheries Wayamba University of Sri Lanka.

According to the preliminary results of this study, following steps are followed to process sea cucumbers into bêche-de-mer Sea cucumber processing mainly involves cleaning, evisceration, first boiling, salting, second boiling and drying. This process takes between 5 to 10 days. Some variations in processing steps were observed among species. All sea cucumbers are cleaned before evisceration to remove slime and sand particles on their body. In most species, evisceration is done making a small cut at the posterior end of the body, however, some species like teatfish, this cut is made along the midline of dorsal body. Eviscerated sea cucumbers are boiled n a freshwater or saline medium and boiling duration is around 5- 10 minutes but found to vary with species. All sea cucumbers are salted after boiling for 1-2 days. Both iodinated and non-iodinated salts are used and 5kg of salts are used for 100 pieces. Salted products are boiled once again for around 3-5 minutes. Sun drying is the widely practiced drying method. Drying time ranged from 3 to 5 days. It was evident that post-harvest losses is around 5 - 8% at the end of the processing cycle. Malpractices during processing such as improper evisceration, intentional adding of sand, over-salting, mixing low-value species with high-value species and poor hygiene practices were identified as some limitations of existing methods.

It was found that domestically processed sea cucumbers always have higher level of moisture and lower level of protein than the commercially processed one. So it is clear that the way of processing has significant impact on the quality of bêche-de-mer. Therefore it is an urgent need to educate and train domestic level processes on how to improve their product quality and project staffs are in the process of conducting such a training workshop at the end of this year based on their findings.

Note
Ganeshan Nishanthan

43rd School Science Program of National Institute of Fundamental Studies, Kandy, Successfully concluded

National Institute of Fundamental Studies (NIFS) under the Ministry of Science, Technology and Research successfully held its 43rd Annual School Science Programme (SSP) from 20th – 23rd of December 2016 at NIFS premises, Hantana Road, Kandy. The main objective of this programme was to motivate younger students in doing scientific research on his/her future carrier. The progrmme which was organized by Science Education & Dissemination Unit of NIFS consisted of lectures ,lab visits and visits to Ukuwela hydro power station and Dambulla Sam Popham arboretum

About 130 students selected from students all island that have passed the G.C.E.O/L Examination in 2015 with 9 Distinctions in the first attempt and currently studying in the A/L science stream participated in this programme. At the end of the programme, valuable certificates were given to participants.

Pradeep Piyathilaka ,
Communication & Media Officer, Science Education & Dissemination Unit, National Institute of Fundamental Studies, Kandy

Thermoelectricity Research at the National Institute of Fundamental Studies (NIFS)

Research work on thermoelectricity (TE) at the NIFS is a pioneering work, since this area of research was new to Sri Lanka, despite the fact that it is a fast growing area globally. While TE can be considered as a source of renewable energy, the main advantage is its ability to improve the overall energy efficiency of existing systems by energy scavenging and co-generation.

In thermoelectricity, heat is directly converted to electricity using thermoelectric effect, known as the Seebeck effect. Unlike other methods, TE can utilise heat energy from any source, for example, solar energy, geothermal energy, biomass, waste energy from cooking, baking, thermal plants and factories, or from automobile engines.

Traditionally, the most popular method of converting heat energy into electricity is through steam engines, which are bulky, noisy, need regular maintanence due to moving parts and can only be operated above a certain temperature (usually above 120° C). Thermoelectric generators (TEGs) are totally silent, just like the solar panels, with no moving parts or need for regular maintenance. More than that, TEGs can be scalled down to miniature or even nano scale, depending on the requirement/application. Some other advantages of thermoelectric generators are the reliability and durability due to their design and use of solid materials. Although the principle behind TEGs are different, they can be used just the same way as the solar photo-voltaic(PV) panels, since there are no moving parts or need for regular maintenance. Cost of production is far less for TEGs, compared to that of the PVs.

Low cost TEGs can be manufactured using locally available material, scrap metals and material fromdiscarded coolers. Currently TEGs are used worldwide in remote monitoring stations where people cannot travel regularly to maintain the power supplies. For example, inter-state fuel pipelines through deserts or cold isolated regions, unmanned monitoring stations and satellites, as well as military installations and expedition to remote areas.

In addition, high-endautomobile manufacturers use TEGs to improve fuel efficiency by converting part of the waste heat from the engine to useful electric energy. Some of the bionic devices and implants, such as pace makers, are now fitted with TEGs so that replacement of the batteries are not required. TEGs in these devices use body heat to generate the electricity needed to run the bionic device.

In addition, people with no access to the electricity from the grid can use TEGs as a source of "energy on demand". For this purpose, TEGs can be designed to run on any available fuel, be it rice husk, wood, biomass or any other fuel. Waste heat generated during cooking can easily be converted to useful energy, sufficient to light few energy saving bulbs and to charge a mobile communication device. Similarly, by using TEGs to utilise the waste heat from bakeries, kilns, factories or thermal power plants, their overall efficiency can be improved and the electricity needs can be satisfied at least partially. With a grant from NRC, new designs for TEGs are tested while new material are developed to increase the "figure of merit", which has direct connection to the overall output.

Project Leader:
Prof. N.D. Subasinghe (PhD),
Associate Research Professor
Research Assistant:
Kanishka Kobbekaduwa (BSc),
NIFS research assistant

Vidya

Advice

R. Wijialudchumi
Secretary
Ministry of Science, Technology and Research

H.M.B.C. Herath
Additional Secretary
(Technical & Research Development)

Renuka Amarasinghe
Additional Secretary
(Technology Transfer)

Nandanie Samarawickrema
Additional Secretary
(Administration & Finance)

Guidance

P.M. Dharmatilake
Director
(Science and Research Development)

Himali W.K. Athaudage
Director – (Technology and International Relations)

Nazeema Ahamed
Director (Planning)

Nimali Kulathunga
Director (Planning)

A.K.P. Peiris
Chief Accountant

Co-editing

Mahesh Samarasekera
(Media Secretary)
0112-372288

B.H. Ishara Sudarshani Dhammika Rathnayake
(Technology and Research Development Division)

Official Photographs

Dulip Nayanapriya
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LAKE HOUSE
Government Relations Dept.

Coordination/Graphics and Creations Supervision
Samantha Karunasekera
Managing Editor – Government Relations (Lake House)
0112 429297 / 077 3493785

Editor
Jayasri Jayakody

Creations
Danushka Bandara / Ashani Jayawardana

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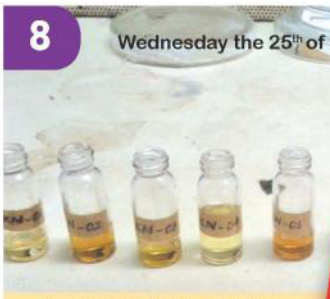
Lake House Commercial Press

Vidya

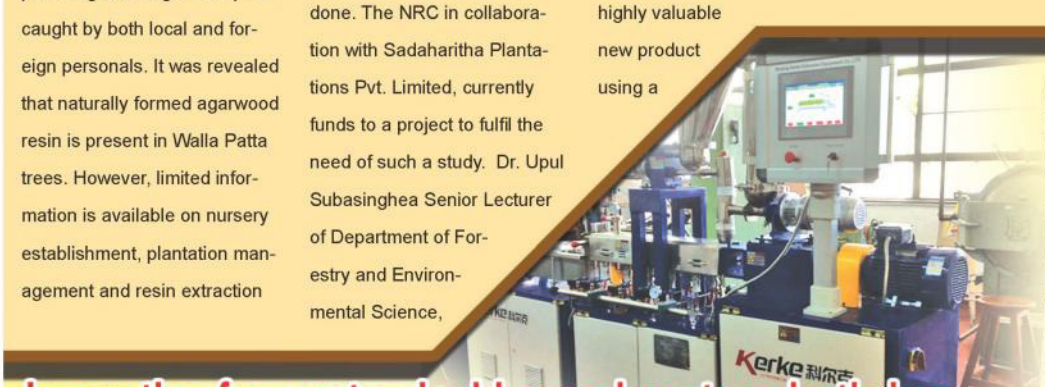


Walla Patta

Can we make it a commercial crop

Agarwood is a highly valuable, aromatic resin produced in the stems, branches and roots of a specific family of plants, distributed in South and Southeast Asia. Gyrinopswalla, locally known as 'Walla Patta' is the only agarwood producing species belonging to the above, naturally growing in Sri Lanka, which can be found in lower elevations of the wet and intermediate zones. After 2012, Walla Patta became popular due to high level of poaching and illegal transport caught by both local and foreign personals. It was revealed that naturally formed agarwood resin is present in Walla Patta trees. However, limited information is available on nursery establishment, plantation management and resin extraction techniques in Walla Patta. In order to use it as a commercially viable agarwood producing species and to popularize it in the world market, a thorough and complete study has to be done. The NRC in collaboration with Sadaharitha Plantations Pvt. Limited, currently funds to a project to fulfil the need of such a study. Dr. Upul Subasinghea Senior Lecturer of Department of Forestry and Environmental Science, University of Sri Jayewardenepura conducts this research under the Public-Private Partnership programme of NRC.The findings of the present research lead to make a highly valuable new product using a new process in the country to obtain a significant amount of foreign income and to provide new employment opportunities, to protect the nature, to contribute to the green economy concept and to provide extra income generation avenues for the villagers of the wet zone of Sri Lanka.

Note - Hasini de Alwis



Innovation from natural rubber and waste polyethylene

to replace asbestos roofing sheet

As the world's tenth largest rubber producer, Sri Lanka produces about 98,600 metric tons of natural rubber annually. But about 16,300 metric tons are exported in raw form without value addition. Therefore, it is a good opportunity to give a value addition to raw rubber by using Natural Rubber (NR) for newer applications. Polyethylene (PE) is available in local market in large quantities. It may be also a solution for the waste polyethylene, if waste polyethylene can be used as a raw material in producing something new. The government of Sri Lanka has taken initial steps to ban the use of asbestos as a roofing material. Therefore, it is a timely needed to introduce economically feasible new roofing material to the market. Development of a roofing material from NR and PE will be highly beneficial to Sri Lanka, to give a value-addition to raw rubber exports, to find an alternative cost competitive roofing material. The National Research Council is currently funding a Private-Public Partnership project along with Samson Compounds PLC to develop a natural rubber-polyethylene thermoplastic blend to use as a roofing material to substitute asbestos.It was a concept of Dr. Shantha Walpalage of University of Moratuwa (UoM) who came with a successful project proposal to introduce this technology to rubber industry in Sri Lanka. A laboratory scale twin screw extruder was purchased to the Polymer Processing Laboratory of the Chemical and Process Engineering Department in UoM under this project. Sample preparation has been started and required experimental procedures are carried on right now.

Note - Wathsala Wickremaarchchi

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