Wednesday the 26th of July 2017

Vidya

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

Daily News

Initiatives to introduce STEM education to the Education system

Dulip Nayanapriya - Ministry Media Unit

The first workshop of STEM education introduced by the Ministry of Science, Technology and Research was held recently at the Global Towers Colombo under the patronage of the Minister of Science, Technology and Research Susil Premajayantha.

STEM education is one of the special programmes introduced by the Ministry. The aim of this programme is to have more students engaged in studies related to science and technology. The students would be able to select subjects like Science, Technology, Engineering science and Mathematics according to their preference. This was implemented with the support of the Ministry of Education. Under the present education system, Mathematics and Science are mandatory subjects in the Ordinary level examination and yet, the number of students taking Science and Mathematics for Advance level is comparatively very low. Many students select either Arts or Commerce. New technology has become the deciding factor for our future. Many countries have already taken measures to implement STEM education realizing the importance of it.

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Udaya R. Seneviratne as the new secretary

Udaya R. Seneviratne was officially appointed as the Secretary to the Ministry of Science, Technology and Research on 27 June 2017 at the Ministry. Secretary to the State Minister J.M Mangalatissa, Additional Secretary H.M.B.C Herath (Technology & Research Development), Additional Secretary D. Nandani Samarawickrama (Administration and Finance) and Administrative officer K.T D K Kariyawasam also participated at the event.

Our appreciation for the Guidance

"Vidya" editorial board extends its greatest appreciation to the former Secretary to the Ministry of Science, Technology and Research R. Wijialudchumi for the given Guidance.

SOLAR ASIA - 2018

"To be a world renowned center of excellence for research in fundamental studies"

4th INTERNATIONAL CONFERENCE ON SOLAR ENERGY MATERIALS, SOLAR CELLS & SOLAR ENERGY APPLICATIONS
4 - 6 January 2018

The Solar Asia 2018 international research conference will be held at the National Institute of Fundamental Studies, Kandy from 4th to 6th January 2018.Previous conferences in this series have been held in Sri Lanka (2011), Malaysia (2013) and India (2015). Demand in Sri Lanka's power sector, which is driving the economic activity and development, has been outstripping supply and increasing at 8% annually.The power generated by using fossil fuels (diesel, coal) is becoming more and more expensive day by day. As a long term solution to this problem, the Sri Lankan government has decided to increase the contribution from renewable (other than hydro) by 10-15% within the next five years by promoting solar, wind and other renewable energy technologies. Sri Lanka, with its high solar insolation and number of other factors, has a great potential to be a showcase for renewable energy technologies.

The "Solar Asia 2018" conference will cover latest developments and novel research findings on solar energy materials, solar cells and solar energy applications such as solar energy conversion and associated applications.

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International Conference on Natural Products Genomics and Drug Discovery

Human Genetics Unit of the Medical Faculty of Colombo University and International Institute of natural Products Genomics and Drug Discovery in collaboration with the Ministry of Science, Technology and Research organized an international conference under the patronage of Minister of Science, Technology and Research Susil Premajayantha.

It is a commonly held opinion that if we are contract diseases naturally, we can also cure it using natural products. In the19th century, pharmacies in Europe and North American sold more natural products than chemical. Accordingly, 80 percent of the medicines that are being used today are made out of natural sources.

At present among 121 drugs that are needed to treat cancer patients,90 of them are from plant sources.

Sri Lankan Ayurvedic medicine is based on herbal plant sources. 'Ayurveda' means knowledge about life and the knowledge about how diseases can be cured naturally. Therefore, in a country like Sri Lanka which is so rich in nature, it is very important to have a conference on natural herbal products.

The conference also highlighted how natural products would have an effect on modern medicine. It was also discussed how natural products could help in finding new medicines for many of the diseases prevalent today.

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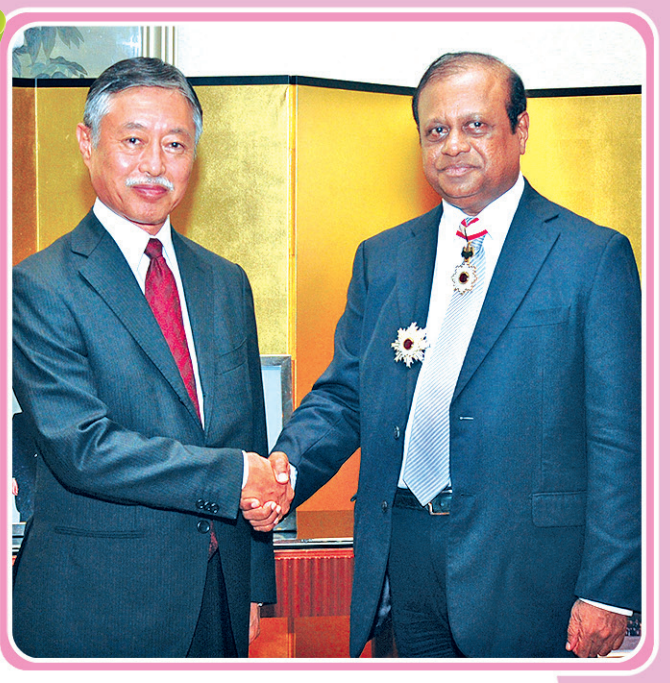
Solar Asia

Scientists, technologists, university academics and postgraduate students from several countries, who are active in solar energy research are expected to participate in the conference.

The conference will provide a forum for researchers from Asia and other countries to present their research, to get exposed to latest developments in solar cell technologies and to network with other research scientists. This is also an excellent opportunity for the industry to showcase latest commercially available research equipment, solar energy products and related technologies. The Ministry of Science, Technology and Research and the National Science Foundation are expected to support and facilitate the organization of this conference.The deadline for the abstract is 15th August 2017.

Please free to visit conference website http://www.solarasia2018.nifs.ac.lk for more details.



Minister of Science, Technology and Research Susil Premajayantha received "Order of the Rising Sun" award from the Japanese government.

Japanese Ambassador to Sri Lanka Kenichi Suganuma recently organized a ceremony to celebrate the event at the Japanese Embassy in Colombo.

Continued from page 1 -

School Education

When compared to developed countries, Sri Lanka is 15 years behind in the field of Science and Technology. It was because the country was unable to go with the technological tide and the country was also not focusing on an economy based on technology and new innovations. The government, however has taken several initiatives to develop Science and Technology, Nano technology, Bio Technology, Robotics, Artificial Intelligence & ICT. STEM has been introduced to the education system to produce more and more technologists and inventors in the field of science. As a first step to implement the programme island wide senior officers attached to the provincial science unit and Science education instructors were informed about the above initiatives. They will be well prepared and trained by domestic foreign experts on Nano technology, bio technology, artificial intelligence, robotics, satellite mass media and communication. They will also be informed about the researches that are being conducted at the Industrial Engineering Institute (ITI), Arthur C Clarke Institute or Modern Technologies (ACCIMT) and Sri Lanka Nano Technology Institute (SLINTEC). The first Symposium was held at the Science Education Unit in the North Central, North Western, Central provinces and the second Symposium was held in the Southern, Western and Sabaragamuwa provinces and the third workshop was held in the Northern, Eastern and Uva provinces. Secretary to the Ministry of Science, Technology and Research, Udaya Senaviratne, Secretary to the Ministry of Education Sunil Hettiarachchi, officials attached to the Central, North Central and North Western provincial science education unit and Science education instructors were participated.

Scientific Research needs to be supported for the development of a country

Udaya R. Seneviratne,
Secretary to the Ministry of Science, Technology and Research

As Udaya R Seneviratne assumed duties as the new Secretary to the Ministry of Science, Technology and Research having worked in many high positions in several agencies working towards social upliftment, he sat down with us for an interview:

- **What are your thoughts on taking on this new role as the Secretary to the Ministry of Science, Technology and Research?**

I assumed duties as the new Secretary to the Ministry of Science, Technology and Research on the 27thof last month. But I had also previously, in 2015 worked as the Secretary to this Ministry. But at that time the Ministries of Higher Education, Highways, Science and Technology functioned under one Ministry and thus Science and Technology was just one subject under a larger Ministry. This time, it has received its own Ministry. The subject matter in this Ministry is not new to me and I see Science, Technology and Research as one of the most important areas in our country and I am very happy to be appointed as the Secretary to such a Ministry.

- **In what way so you perceive the importance of the area of Science, Technology and Research?**

When we look at the developed countries in the world, we clearly see that their progress has been based on science, technology, research and new findings. When we look at the progress of the human race as a whole, it also becomes clear that up to date knowledge, new discoveries and new technology were the main factors behind our growth. Accordingly it is no secret that the development of any country is based on this sort of science, technology and the discoveries made through research and its implementation. Thus the importance of science, technology and research is great. I will not be mistaken if I say that no matter what subject, its continuity depends on scientific research and new findings. But third world countries such as ours, invest very little on this sector. Hence it is important to give prominence to investments in this field. If we expect our country to develop, this sector needs to be supported. This is the foundation for the development of any sector, be it; agriculture, education, health or industry. The reason being that for any methodology or new finding you first need research based exploration. We will not find anything new if we don't conduct the necessary research first. Whether it is a new drug, new equipment, methodology or technology, they all first need scientific research.

- **Can we touch on how we can further strengthen Science, Technology and Research?**

> *"But third world countries such as ours, invest very little on this sector. Hence it is important to give prominence to investments in this field. If we expect our country to develop, this sector needs to be supported.*

To be honest, we cannot discuss the subjects of science, technology and research as separate entities. A person finds something new having worked hard to deal with matters which are related to all three factors. Thus it is important to strengthen and promote science, technology and research. In our country today, it has become a great need to scientifically verify technology, research and new findings. If we takethe health sector as an example, the dengue menace has become a great challenge. The disease at present is being treated to a certain extent using western medicine. At the same time, we also have many successful research being conducted for this in the arena of indigenous medicine. In the meantime, though we are unaware, we have local doctors finding indigenous medicine for this through simple means. But the issue is we still have not found the scientific basis for such drugs. The reason for this being that we have not proved results through extensive research. But if we can prove the results of these drugs through scientific research, we can find a solution to this disease which thus far has had no proper treatment. As an example, a traditional doctor engaged in indigenous practices in the Matale district can produce a drug got through papaya juice. And if we can help them in that production and prove its benefits through science, then we can find a solution to this disease soon. In order for this to happen, we first need a proper programme. The treatment and medicine found through such research will be of importance to everyone around the world for sure. This will benefit the whole human race. We cannot put a price on that. Truly we have many hidden traditional knowledge and what is needed now is scientific research into them. Another example where research is needed is cancer. We have a group of people who are extremely enthusiastic about research in this area. Prof Sameera from the University of Colombo is engaged in such a task. But we have a long way to go before we see results from the research. They need research equipment to help them and funds, if we can help them get the equipment and funds they need, we can help them succeed in their research. If they do not receive the assistance they need, a finding which may be important to the world may remain incomplete.

- **What do you propose as a solution to this problem?**

It is a sad fact that many intellectuals and professionals leave the country not just because of economic benefits but because there is insufficient support to build their professional careers and goals. And when the developed countries recognize such talented people, they immediately give them all the support they need and take the maximum out of them. The majority of our scientists are abroad and they discover valuable new products. Almost every organization would have Sri Lankan scientists working in them. Furthermore, our country is rich in biodiversity but we still have not reaped the full benefits of this as we have not been able to conduct much scientific research into ways we can benefit from this richness. For this, we need investment. Foreigners take our local resources and manufacture valuable products abroad. But we too can progress using our local resources and for this we need science, technology and research. The Ministry of Science, Technology and Research is working towards achieving this comprehensive goal with the greater involvement of the public sector while working together with the private sector. Unlike other ministries which conduct major construction projects or build roads, the results of our ministry might not be apparent immediately. It takes many years of working in unseen laboratories, isolated from all to produce research that is beneficial for the human race. If we take the finding of new seed varieties, it takes at least 10-15 years to have a successful new seed. People like instant solutions and there is not much awareness in our country over matters such as this. Therefore many do not appreciate such research. We have a problem with what society holds to esteem. Most people are only aware of their own immediate problems and the solutions given to them. For an example, we can talk to them about the issues surrounding the dengue menace, waste disposal and floods. Thus scientific research will only gain some value if it provides scientific solutions to these burning issues. Hence we need to support research. As a third world country, our priorities are trapped within the battle of having to provide the basics such as food and housing. As a result, we don't have enough resources to invest in something new. But if we are to emerge from this vicious cycle, we need to take this step. The Minister, having had a good understanding of our current needs and the need for social progress has made a comprehensive programme taking into consideration several fields of expertise. Having been given a clear vision, we hope to give all the assistance needed to make this programme a success.

W.A.S NisansalaKumari
Photographs: Ranjith Asanka

National Institute of Fundamental Studies (NIFS),

The leading Institute for Basic Scientific Research in Sri Lanka

National Institute of Fundamental Studies (NIFS), previously known as the Institute of Fundamental Studies (IFS), is the leading Institute for Basic Scientific Research in Sri Lanka,under the Ministry of Science, Technology and Research. The institute wasfirst established in 1981 in Colombo and later shifted toHanthana, Kandyin 1986.Eminent Sri Lankan scientist, Prof. Cyril Ponnamperuma was the Director since 1985 who led for the initial development of the institute.

This is the only national institutewhich, by its Act, has the main mandate to engage in Fundamental Research. NIFS serve as the national body to initiate, promote and conduct basic research on fundamental aspects of mathematics, physics, chemistry and life sciences for the advancement of scientific knowledge and for the development of the nation.

Besidesengaging in scientific research, NIFS serves as a well-equipped center for the training of young scientists in the country. There are about 84 postgraduate research students (MPhil and PhD) work as Research Assistantsat NIFS in excellent research projects for their postgraduate degrees. MSc students and undergraduates from state universities and Higher Educational Institutes also undertake there research projects at NIFS annually. Moreover,Pre- University students and other school leavers who are interested inhaving an exposure to an exciting research culture, also work as volunteers in research laboratories. These students gain invaluable research training under competent senior scientiststo serve the nationin the future as great scientists.

About 20Senior Research Professors, Research Professors, Associate Research Professors, Senior Research Professors, Senior Research Fellows and Research Fellows work at NIFS. These scientists are engaged in various Research Projects under six main Research Units. Prof. Parakrama Karunaratne is the present Director of the Institute. Some of the fundamental research findings have already shown very promising results and have gained the interest of both National and International community and also attention of Sri Lankan government and the private sector.

Energy and Advanced Materials research unit of NIFS includes the Condensed Matter Physics and Solid State Chemistry research project, whichis engaged in research on synthesizing novel solid polymer and quasi-solid polymer electrolytes for dye sensitized solar cells, developing novel cathode materials for Mg++ ion rechargeable batteries, fabricating and characterizing Electrochromic display devices with novel intercalation materials.This research group has successfully developed an innovative low cost polymer Nano fiber water filter.

Low cost Polymer nanofibre water filter fitted with a water bottle stopper (above)

Nanotechnology & Advanced Materials project under the same unit is engaged in target oriented fundamental and advanced scientific investigations leading to develop Sri Lankan minerals for nano-technological and advanced industrial applications.

At present, their research activities are carried out mainly on developing Sri Lankan vein graphite for rechargeable battery applications and synthesis of graphene based nano materials and developing local minerals for efficient water purification.

Energy and Advanced Materials Chemistry research project carry out research on renewable energy, mainly focused on chemistry and physics of new materials for the conversion of solar energy into chemical and electrical energy.

Material Processing and Device Fabrication research project under the Energy and Advanced Materials Research Unit of NIFS does basic research on material processing and device fabrication, especially on graphite, graphite based devices and carbon super capacitors.

Theoretical Physics and Computational Studies research unit of NIFS consists of two main research projects. First one is The Quantum physics research group. It investigate infinding answers for three main unsolved problems in quantum physics. The other project is on Brain Computer Interface research which has shown very promising results recently. The group has successfully made a direct link between the human brain and the computer, known as Brain-Computer Interface (BCI). This enables man to control electronic devices by using human thoughts. In the near future, it is expected to help disable peopleby enabling them to live comfortable through controlling the equipment by their thoughts.

Natural Products & Food Chemistry is one of the key research units running at NIFS. Natural Products research project, laid under this unit studies the chemistry and bioactivity of secondary metabolites from plants, epiphytic and entophytic fungi, and edible fruits of Sri Lanka. Recognition of natural sources of bioactive compounds is necessary for identification of extracts/compounds that can be used in the formulation of health and food related products, and as reagents for crop protection.

The Nutritional biochemistry project of this unit is conducting extensive research on various aspects of functional and nutritional properties of foods. The aim of the project is to establish scientific bases leading to a healthy human life. The project covers a wide area and includes bioactivity and bioavailability of food, food safety, and functional food product development.

Fourth main research unit of NIFS is Microbiology and Carbon Sequestration. Microbial Biotechnology research project under this unit introduced world's first Biofilm Biofertilizer which is able to reduce the use of imported chemical fertilizers by up to 50% in the agriculture and plantation sectors (mainly for non-legume crops) with an average yield increase of up to 30%. Their trials have shown that in rice and tea cultivations, up to Rs. 15,000 per hectare per year can be saved just by reducing the use of chemical fertilizers. Accordingly, Sri Lanka will be able to save about Rs. 30 billion worth chemical fertilizer imports. The biofertilizer is now being exported to India for use in tea cultivation as well.

Rhizobium Project of this unit aims to replace the use of urea in legume crop cultivations. This project introduced Sri Lanka's first rhizobium inoculant bio fertilizer. Application of this bio fertilizer to legumes like cow pea, bean, mung bean can replace 100%the amount urea, which is added to the field. This reducesaid to stop soil destruction by chemical fertilizer and save billions of money, which is spent for urea importation. Up to now, this rhizobium inoculant is successfully used in 7500 acres in Soya, 1500 acres of bean and 200 acres of mung bean as well.

The bioenergy and soil ecosystems project works on utilizing efficient degraders of cellulose, hemicellulose and lignin from the environment and their biofilms or co-cultures to convert cellulosic biomass into fuel. The project on biodiesel production has successfully isolated and identified potential cayanobacteria for biodiesel production. In soil ecosystem research project, digital maps showing available soil carbon stocks have been prepared. This baseline information is vital to establish the national carbon accounting system for Sri Lanka.

The Earth, Environment and Biodiversity research unit of NIFS is a broader unit. Earth Resources & Renewable Energy research project is working on geothermal resource mapping to evaluate the geothermal potential of Sri Lanka with a view to utilize these resources for national development.

A pioneering research on thermoelectricity has been initiated with the objective of this new area of research to Sri Lanka.Thermoelectric generators are used to produce electricity directly from any source of heat energy and at any temperature range.

Professor Parakrama Karunaratne
Director,
Senior Researcher
National Science Foundation of Sri Lanka

Sri Lanka's unique biodiversity is a significant line of research at the NIFS. Factors affecting biodiversity conservation, taxonomic research, and restoration ecology are the priority areas of the Plant Taxonomy and Conservation Project. The NIFS-PophamArboretum in Dambulla is a benchmark research site for a dry zone woodland created by assisting natural regeneration in a tropical country. It is also an ideal location for ecological research on biodiversity and natural forest regeneration in the dry zone and for educational tours for school children as well.

Basic research in biodiversity covers every aspects of ecosystem functions. Research in the Evolution, Ecology and Biodiversity project focuses on understanding how ecosystems are modified by the loss of biodiversity, how ecosystems sustain human lives and diversity of species is fundamental to healthy ecosystems.

Chemical and environmental modeling research group is interested in monitoring atmospheric depositions, landfill leachate, water and soil pollutants and developing and enhancing the properties of biochar.

This research unit has highlighted the potential ofbiochar derived from waste material for the remediation of pesticides, heavy metals in wastewater and soil environments. Also they found have demonstratedatmospheric depositions in Kandy city is high in toxic heavy metals.

The Plant Biology project is looking at the degradation of our dry forests from chena cultivation and human intervention in the forests. Its objectives are to develop methods to assess the extent of degradation and to suggest means of restoring the forests to their previous state.

This project also experiments on using plants to remove hazardous pollutants such as heavy metals, textile dyes, nitrates and phosphates from waterways.

"Laboratory" of Primate Biology research project of this unit is based inthe dry-zone forest at Polonnaruwa and their study subjects are the plants and animals that live there, particular in the primates toque macaques, hanuman langur, purple-faced langur and the slender loris. They do studies regarding the evolution of social behavior in primates and behavioral ecology. Also they actively promote nature conservation through public education, workshops and documentary films.

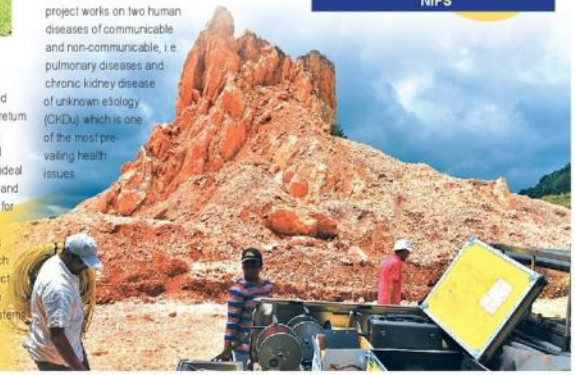
Molecular Biology & Biotechnology research unit of NIFS consists of two research projects that basically lies within biotechnology and human disease control. Molecular biology& Human diseases research project works on two human diseases of communicable and non-communicable, i.e. pulmonary diseases and chronic kidney disease of unknown etiology (CKDu) which is one of the most prevailing health issues in Sri Lanka. A combination of modern molecular microbiology techniques are used to answer the questions of who, where and how microbes lead to respiratory/pulmonary diseases, as well as on what and why about the factors that lead to CKDu.

The medical entomology research project under this unit is engaged in five different areas of research with the collaboration of Department of Zoology, University of Peradeniya, i.e. DNA barcoding of Sri Lankan mosquito species, studying theinsecticideresistance of dengue mosquitoes, Wolbachiabacteria to control disease spreadingmosquitoes, Frog and bird biting mosquitoes in Sri Lanka which transmit disease pathogens from frog and birds to humans and acaride resistance in cattle and dog tick in Sri Lanka.

NIFSalso hasspecial unit to disseminate science among the general public and the scientific community. Science Education & Dissemination Unit (SEDU) of NIFS works on nurturing the exchange of technical and scientific information for the scientific community and promoting the public understanding of science. SEDU regularlyorganize workshops and conferences; educational exhibitions; public lectures; research meetings; Website projects; YouTube Video Channelprogramme, the South Asia's First Free Science SMS Service, annual School Science Programme, teacher training programmers, educational and lab visits for students andschool teachers.

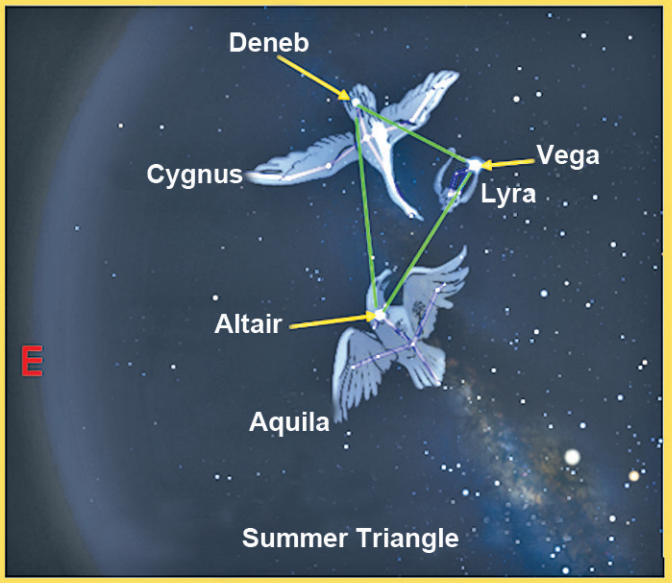
NIFS is dedicated to do research for the wellbeing of the nation and for the sustainable development of science.

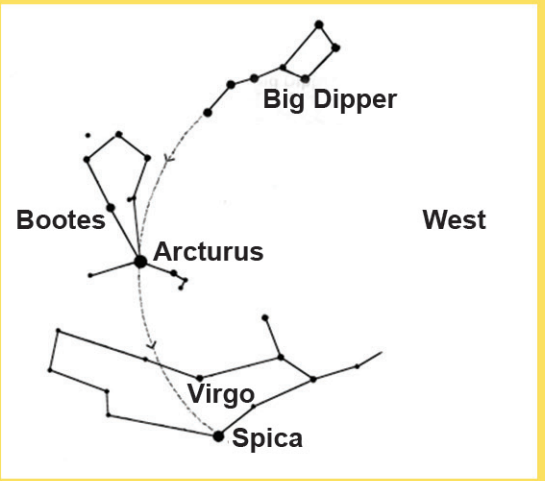
Pradeep Piyathilaka
Communications and Media Officer
NIFS



Let's get to know the Night Sky IV

You will remember that information about the star patterns that could be identified in the night sky was published in the past issues of the 'Vidya' newspaper. The star patterns that were visible at about 8.00 pm those days were introduced in those issues. Even at present you can observe the same star patterns slightly to the west of their former positions. Accordingly, you can observe that the planet Jupiter in the westerly direction near the Virgo constellation and the Planet Saturn between the constellations Scorpio and Sagittarius right overhead leaning towards the south. Furthermore, it will be made clear to you that the constellations that were positioned in the westerly direction in the months of April and May (Taurus the bull, Orion the Hunter and Canis Major the greate dog) cannot be observed in the present night sky. Even though the sky we can see is separated into 88 constellations, only about 40 – 45 constellations can be observed at one time. The planets and constellations that can be observed in the night sky cannot be observed in the dawn sky and, instead of them, new planets and constellations become observable in the sky at dawn. These days you can identify three bright stars at about 8.00 pm right overhead slightly to the east. These three stars belong to three important constellations and they are named Vega, Altair and Deneb. You can create the Summer Triangle in the northern sky by mentally joining these three stars with one another. Out of these stars, the star Vega is the fifth-brightest star in the night sky and it belongs to the constellation Lyra. The Star Altair is in the 13th brightest star and belongs to the constellation Aquila. The star Deneb is in the 20th brightest position and belongs to the constellation Cygnus.





Other than these, let us try to identify another important constellation that can be observed in the night sky. This constellation is named Bootes (The Herdsman) located in the northern sky in the western direction. The brightest star in this constellation, Arcturus, is the fourth-brightest star in the night sky. The star Arcturus can be easily identified by identifying the Great Bear constellation as described in the last issue and mentally joining the two stars on its tail and extending it in an arc towards the top of the sky. After identifying that star, the constellation Bootes can be identified by mentally joining the stars in the shape of a kite with it.
Furthermore, the brightest star in the constellation Virgo, Spica, can be identified right overhead towards the western horizon. This is the 16th brightest star in the night sky. The Virgo constellation depicts the figure of a woman with a bouquet of flowers in her hand and it can be found by following the curve of the Big Dipper/ Plough to Arcturus in Boötes and continuing from there in the same curve.

A production of Sri Lanka Planetarium

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"Singithi Tharu" Astronomy Course

The third group of "Singithi Tharu" Astronomy Course will be launched in September 2017 and the course period is four months. This course is being held for students from Grade 01 to Grade 05. Students who wish to follow this course can fill the form obtainable from the Planetarium Website www.planetarium.gov.lk or the planetarium Office and send them to the Planetarium before 25th August 2017. Please note that only a limited number of students will be enrolled due to lack of space.

Astronomy Olympiad 2017 Seminars

A series of seminars organized by the Sri Lanka Planetarium for the Astronomy Olympiad Competition will be held every Saturday at times given below.

- 8.30 am – 10.30 pm
Grades 6 – 9
- 8.30 am – 12.00 noon
Grades 10 – 13
- 12.30 pm – 2.30 pm
Grades 6 – 9
- 12.30 pm – 4.00 pm
Grades 10 - 13

The seminars will be repeated on
As space is limited, those interested have to get themselves registered before coming by calling Ms. Padmini on 076 – 6365989 between 1.00 pm – 3.00 pm from Tuesday to Saturday.

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Defend against dengue

How does dengue spread ?

With the rapid increase of dengue, the number of people affected has also increased compared to the past few years. Over 50,000 people have been diagnosed with dengue within six months and the number of patients getting admitted to private hospitals is also on rise. Nearly 230 people have died so far and it was reported that government hospitals refused to admit patients diagnosed with dengue due to lack of space.

There are a few main reasons for the increase in dengue patients in the recent past. It has to be stressed here that all these years, it was the Type 3 (DENV3) viruses that was being transmitted but this time it was Type 2 (DEN2). The people had the immunity to overcome dengue caused by Type 3 as it had been present for a longer period in the country. But, the unexpected transmission of Type 2 meant that it spread faster and as a result many people have been diagnosed with dengue.

The constant change in the climate also paved way for the increase in mosquito density. The Anopheles mosquito that spread Malaria usually lived near water bodies or near rivers in forests, therefore it was very easy to get rid of them. But with the increase in development activities and construction sites, the breeding ground of dengue mosquitos (Aedes) have also increased rapidly.

There are around 140 types of mosquitos in the country and there are also mosquitos that drink flower nectar. It is only the female mosquitos that suck blood; male mosquitos do not suck blood. Scientifically, it has been proven that the female mosquitos get protein for the eggs from blood. There are types of mosquitos that transfer the disease from one human being to another, they are Aedesaegypti and Aedesalbopictus.

In 2015, the World Health Organization (WHO) declared Sri Lanka as a Malaria free country. Nearly 10 people are diagnosed with Japanese Encephalitis annually in Sri Lanka. Even though it was on rise in 80's, the country has been able to control it by now.

Professor Parakrama Karunaratne
Director,
Senior Researcher
National Science Foundation of Sri Lanka

Among the diseases caused by parasites and viruses, the diseases caused by viruses are spreading fast. Dengue mosquitos bite during the day time and evolve around the house. As the mosquitos do not stay within the house premises after sucking the blood, it is not very easy to destroy them unlike Malaria mosquitos. Usually Malaria mosquitos stay on the walls after sucking the blood, so it was easy to kill them by spraying either DDT or some other chemicals. Therefore it is a challenge to eradicate dengue mosquitos as it has a completely different life cycle. When a dengue patient is reported from a particular area, it is normal procedure to fog the surrounding areas up to 300 m. But a large amount of small insects die due to fogging.

Meanwhile, with the increase in mosquito density, fogging alone cannot control the crisis. Dengue mosquitoesbecome very active during early morning and in the evening after sun set, therefore it is very important to conduct fogging at the right time.

As there is no proper treatment to cure dengue, it is vital for the public to be more careful. Many researches are being conducted by the National Science Foundation Sri Lanka and at the university level. Measures are also being taken to produce bacteria that could kill them and to control the disease by identifying the DNA of the mosquito. The mosquitos that have Wolbachiavirus cannot spread dengue. Research has also revealed that it will reduce the life span of those mosquitos. Aedesalphoopictusnaturally has 20 percent of that virus. But this virus is not present in AedesAegypti, the main vector that breeds dengue. Therefore, Australian researchers have found that it is possible get the virus from fruit fly and insert it to AedesAegypti.

If a person has this virus in his body, and the Aedes mosquito bites him, there are possibilities for the mosquito to transmit the virus to another person. The virus would spread around the whole body within two to three days. From then onwards, the person will begin to show symptoms of dengue. But if the Wolbachia is present in the mosquito, it would not allow the virus to spread. When this virus is present, it will also not let any other virus or parasite to grow, therefore this could be one of the measures that can be immediately taken to control the crisis. When considering the initiatives taken to bring mosquitos with Wolbachia from Australia or to take mosquitos from Sri Lanka and insert it with Wolbachia, the second option would be more effective. If we bring mosquitos from Australia as they are not familiar with the surrounding, they might die soon but the Sri Lankan mosquitos would survive and produce more. This would also help to eradicate dengue totally in three years' time.

At present, we need to destroy all the possible mosquito breeding places. When inspecting the houses, it was obvious that many mosquito breeding places were formed due to carelessness of the public. Furthermore, it is very important to manage garbage disposal. People should identify all the mosquito breeding places and immediately destroy them. Tins and cups have to be cleaned well to destroy the eggs if there are any. In order to identify the mosquitos separately, DNA barcoding system has been started. As a result, around 15 mosquitos have already been identified. The National Science Foundation of Sri Lanka and Science Faculty of Peradeniya University together conducted the above research.

> ***"As there is no proper treatment to cure dengue, it is vital for the public to be more careful. Many researches are being conducted by the National Science Foundation Sri Lanka and at the university level."***

By Asela Kuruluwansa

National Symposium on Disease Vectors and Challenges in Dengue Mosquito Control

Date : 14th & 15th of November 2017 **Venue : National Institute of Fundamental Studies (NIFS)**

The aim of the symposium is to assemble the academics/ researchers engaged in vector control and vector biology research, and to promote in-depth discussions on the discipline. A special emphasis will be placed on the control of dengue mosquitoes, which has become a critical public health problem today.

Registration Fee Rs.1500/-

Keynote Address:

Dr. Hasitha Tissera, Director/ National Coodinator, National Dengue Control Unit

Plenary Lectures:

- **Prof.S.H.P. Parakrama Karunaratne,** President/ Sri Lanka Society for Vector Biology & Director/ NIFM
- **Prof. Wimaladharma Abeyewickreme,** Faculty of Medicine, Kotelawala Defence University
- **Prof. Nissanka De Silva,** Department of Zoology, University of Sri Jayawardenapura
- **Prof.S. Noble Surendran,** Department of Zoology, University of Jaffna
- **Dr. Priyanka De Silva,** Department of Zoology, University of Peradeniya
- **Dr. Subhashini Ariyaprema,** Entomologist, Ministry of Health

Important Dates

- Abstract Submission : 15th August 2017 (closing date)
- Notice of acceptance : 15th September 2017
- Submission of the revised paper : 30th September 2017 (Closing Date)
- Registration: 07th November 2017 (Closing Date)

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Jointly Organized by the NIFS, Sri Lankan Society for Vector Biology and Department of Zoology, University of Peradeniya

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Defend against dengue...

The National Institute of Fundamental Studies, Professor Dhammika Maganarachchi, Department of Zoology, Faculty of Science, University of Peradeniya, Priyanka de Silva and Thilini Weerarathne are conducting the research. It is a two year project. Measures have been taken to identify the bacteria that naturally exists in water bodies where mosquitoes are likely to use as a food source and to use genetic technology to produce poisonous bacteria through BTI bacteria. These can be put in mosquito breeding places. The poisonous bacteria released by BTI and cyanobacteria would get mixed with the food that mosquitoes take. But the biggest problem in releasing Bacillus thuringiensis or BTI bacteria to the environment is that they will not survive in the hot sun.

Mosquitoes suck blood, therefore there is higher tendency for them to transmit diseases that animals have. Mosquitoes suck blood from frogs as well, so there is a higher possibility of diseases being transmitted to human beings. Even though yellow fever or Zika virus fever has not been reported so far, Aedes aegpti has the ability to spread it. Therefore, it is very important to understand the risk factors attached to dengue mosquitoes.

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