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Dr. Harsh Vardhan Launches CSIR Fast-Track Mission Mode R&D Project on Eco-Friendly Firecrackers and E-Crackers

CSIR

7th January, 2018

Dr. Harsh Vardhan addressing the meeting on non-polluting firecrackers. DG, CSIR, Dr. Girish Sahni is also seen.

Union Minister for Science & Technology, Earth Sciences and Environment, Forest & Climate Change, EFCC and Vice President, CSIR, Dr. Harsh Vardhan, has called for a more favorable approach in addressing the issues of pollution due to firecrackers, as well as protecting jobs and businesses in the existing value chain of firecrackers, through the power of science. Addressing a brainstorming meeting on non-polluting firecrackers held at Council of Scientific & Industrial Research (CSIR) here today, Dr. Harsh Vardhan emphasised that all S&T organizations should come together to address this issue and that CSIR is uniquely positioned to provide amenable solution to this menacing problem. He urged scientists to put their heart and soul into this endeavor and give a new Diwali to the children of the country, which could be remembered in history as "CSIR's Diwali". The Minister highlighted the background issues on the matter called for focused R&D efforts on non-polluting firecrackers/fireworks. He also said that he strongly believes that science has an answer to this problem. Appreciating the efforts of CSIR towards the development of eco-friendly crackers, Dr. Harsh Vardhan also called for comprehensive measures such as development of suitable masks to address the overall issues of pollution. He stressed the need for simultaneous action on product development, regulatory approvals and supply chain aspects. DG, CSIR, Dr. Girish Sahni, pointed out that CSIR is committed to national priorities and towards this important societal cause. "Several CSIR laboratories have come together and are putting together a robust S&T strategy for

development of eco-friendly firecrackers and fireworks", he said. Dr. Sahni stated that the first phase will cover reduction of pollutants, while future strategies will cover removal of pollutants from the compositions.

An inter-ministerial/departmental Expert Committee has been constituted by the CSIR to guide and mentor CSIR laboratories in this unique R&D endeavour. Taking the R&D ideas forward, CSIR also proposes to meet the manufacturers of firecrackers in the country to involve the concerned stakeholders in its larger action plan. Each of the members appreciated the CSIR initiative and voiced their strong support to make this endeavour a great success.

There have been widespread reports and observations of rising levels of pollution due to firecrackers/fireworks, especially during the festival time of Diwali. There have been reports of lung related disorders and upper respiratory diseases due to the high levels of pollution. One of the stringent measures recently adopted in Delhi/NCR was to ban the sale of firecrackers during the festival period by the Hon'ble Court.

CSIR Directors, Dr. Rakesh Kumar, CSIR-NEERI and Prof. Santanu Chaudhury, CSIR-CEERI gave an overview of the strategy and action plan that CSIR has put together to address the directives of Hon'ble Minister. The Directors elaborated on potential measures to curb pollution, which included preventive and post combustion measures. The viable propositions will also pay due attention to the light & visuals as well as sound factors of the newly proposed compositions. E-crackers and chemical-hybrid systems are the other options proposed for pursuit.

Besides Directors and scientists from CSIR laboratories such as CSIR-IICT, CSIR-NBRI, CSIR-IITR, CSIR-NCL, CSIR-CLRI, CSIR-CECRI, CSIR-CGCRI, CSIR-CMERI, CSIR-NPL, and CSIR-NEERI, the brainstorming meeting was also attended by senior members from High Energy Materials Research Laboratory (HEMRL), Pune;

Central Pollution Control Board, Delhi; Ministry of Chemicals and Fertilizers; and DGFT, Department of Commerce, Delhi.

The Council of Scientific & Industrial Research (CSIR), known for its cutting edge R&D knowledgebase in diverse S&T areas, is a contemporary R&D organization. Having a pan-India presence, CSIR has a dynamic network of 38 national laboratories, 39 outreach centres, and 5 units. CSIR pursues wide range of R&D activities in various S&T

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CSIR-IHBT

7th January, 2018

ड्रोन से खोजी जाएंगी हिमालय की जड़ी-बूटियां

रविवार विशेष

मुकेश मेहरा ● पालमपुर

हनुमान आकाशमार्ग से हिमालय पहुंचे थे। वैद्य सुषेण ने उन्हें पहले ही बता दिया था कि संजीवनी बूटी को उससे निकलने वाली चमकीली आभा के जरिये दूर से भी पहचाना जा सकता है। लेकिन पहाड़ पर इसी तरह की कई बूटियां थीं। लिहाजा हनुमान जी को पूरा पहाड़ ही उठा ले जाना पड़ा...। हिमालय पर जड़ी-बूटियां खोजना आज भी उतना ही जटिल काम है। ऊंचे-ऊंचे पर्वतों पर कौन-कौन सी जड़ी-बूटियां कहां-कहां हैं, इसका पता लगाना अरसे से चुनौतीपूर्ण ही बना हुआ था। अब यह काम आसानी से किया जा सकेगा। इसमें ड्रोन और उच्च तकनीकी कैमरे का इस्तेमाल किया जाएगा। काउंसिल ऑफ साइंटिफिक एंड इंडस्ट्रियल रिसर्च (सीएसआइआर) और इंस्टीट्यूट ऑफ हिमालयन बायो रिसोर्स टेक्नोलॉजी (आइएचबीटी) पालमपुर ने इसकी पहल की है।

ये है असल मकसद: देश में लुप्त हो रही जड़ी बूटियों और वन संपदा में हो रहे बदलावों की जानकारी के लिए सीएसआइआर-आइएचबीटी द्वारा यह परियोजना शुरू की जा रही है। संस्थान के वैज्ञानिकों ने जड़ी-बूटियों और वन संपदा का पता लगाने के लिए खास तकनीक विकसित करने में सफलता पाई है। यह देश में अपनी तरह का पहला प्रोजेक्ट है।

हाइपरस्पेक्ट्रल रिमोट सेंसिंग तकनीक: इसे हाइपरस्पेक्ट्रल रिमोट सेंसिंग तकनीक कहा गया है। ड्रोन पर इस तकनीक से युक्त विशेष कैमरे लगाए जाएंगे, जो वनस्पतियों को चिह्नित करने में सक्षम हैं। रिमोट सेंसिंग सिस्टम और कैमरे का सफल ट्रायल किया जा चुका है। अब केवल ड्रोन के आने का इंतजार है। ड्रोन अमेरिका से मंगवाया जा रहा है। इस महीने के अंत तक इसके पहुंचने की संभावना है। संस्थान के वैज्ञानिकों ने बताया कि इस तकनीक से तमाम जड़ी-बूटियों की जानकारी मिलने के अलावा मैपिंग (नक्शा बनाने) में भी मदद मिलेगी।

ऐसे काम करेगी तकनीक: ड्रोन को 400 मीटर तक की ऊंचाई पर उड़ाया जाएगा। इस पर दो हाइपरस्पेक्ट्रल कैमरे लग होंगे। ये कैमरे धरातल पर मौजूद पेड़-पौधों की हाइपरस्पेक्ट्रल तस्वीरें लेंगे। यानी जैसे ही वनस्पतियां इन कैमरों की रेंज में आएंगी, वनस्पतियों से परावर्तित होकर कैमरे तक पहुंचने वाली सूर्य की किरणों को कैमरा दर्ज कर लेगा। परावर्तन की अलग-अलग गणनाओं के आधार पर अलग-अलग वनस्पति की विशेष पहचान दर्ज हो जाएगी।

अलग-अलग वनस्पति से प्रकाश परावर्तन की गणना अलग-अलग होगी, जो इनकी विशेष पहचान बनेगी। ड्रोन पर एक फोटो कैमरा भी लगाया जाएगा, जिसके माध्यम से संस्थान को उच्च गुणवत्ता के जियोकोडेड फोटो भी उपलब्ध होंगे। इस तरह इन गणनाओं और तस्वीरों को डाटा के रूप में दर्ज कर लिया जाएगा।

अन्य खबरों के लिए इस लिंक पर जाएं। www.jagran.com/topics/jagran-special

हाइपरस्पेक्ट्रल रिमोट सेंसिंग के लिए लगने वाले कैमरे का ट्रायल सफलतापूर्वक पूरा किया जा चुका है● जागरण

अमेरिकी ड्रोन की खूबी

इसे 400 मीटर की ऊंचाई तक उड़ाया जा सकेगा। ड्रोन के सामने कोई बाधा आने पर इसकी दिशा खुद बदल जाएगी। ड्रोन का वजन 15 किग्रा के करीब है और यह 35 किग्रा तक का वजन उठा सकता है। इसमें लगने वाले दोनों हाइपर स्पेक्ट्रल कैमरे संस्थान ने विकसित किए हैं। ड्रोन को उड़ाने के लिए आवश्यक अनुमति भी ले ली गई है।

संस्थान ने हाइपर स्पेक्ट्रल रिमोट सेंसिंग तकनीक विकसित की है। इसके जरिये जैव संपदा में विविधता का पता आसानी से लगाया जा सकेगा।

डॉ. संजय कुमार, निदेशक सीएसआइआर-आइएचबीटी

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‘Green’ crackers on the anvil

CSIR-NEERI

7th January, 2018

In a bid to fight air pollution, Science and Environment Minister Harsh Vardhan has tasked the Council of Scientific and Industrial Research to come up with a way to make crackers that are “environmentally friendly” and to use science to save jobs in the industry.

Girish Sahni, Director General, CSIR, in a press statement, said: “Several CSIR laboratories have come together and are putting together a robust S&T strategy for development of eco-friendly firecrackers and fireworks. The first phase will cover reduction of pollutants, while future strategies will cover removal of pollutants from the compositions.”

Other than smoke-aggravating partially-burnt paper that sheaths the gunpowder in crackers, metals in fireworks such as strontium and barium are toxic to human and animal health, and the burning process produces other harmful emissions such as polychlorinated hydrocarbons. Rakesh Kumar and Santanu Chaudhary, directors, CSIR-NEERI, presented a science plan on Friday. Internationally, research laboratories are working to reduce pollution from firecrackers.

A key ingredient in several crackers is perchlorate and replacing them with nitrogen-rich materials or nitrocellulose could make them burn cleaner and produce less smoke, according to a report in the Chemical & Engineering News, of the American Chemical Society. These however make crackers costlier.

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The Hindu

Also Published in:
Hindustan Times,
Focus News

IICB uncovers molecular mechanism of stress-induced gastric ulcer

CSIR-IICB

6th January, 2018

The link between mitochondria in the stomach and the brain was found using rats

Researchers at Kolkata's CSIR-Indian Institute of Chemical Biology (CSIR-IICB) have for the first time identified the molecular mechanism by which acute mental stress affects the stomach causing gastric ulcer or stress-related mucosal disease. Using a rat model subjected to cold-restrained stress, the research team led by Uday Bandyopadhyay from the Division of Infectious Diseases and Immunology at IICB has used drugs that can act specifically on mitochondria present in the stomach to prevent gastric ulcer caused by stress. When subjected to stress, the mitochondrial respiratory capacity was disrupted, ATP production was reduced and oxidative stress increased. Stress also causes morphological changes to the mitochondria such as increased fragmentation. The results of the study were published in the journal *Free Radical Biology and Medicine.*

"Due to oxidative stress and fragmentation, the mitochondria in the gastric mucosal lining cannot behave in a normal fashion and ATP production gets further compromised. In the absence of ATP production, cells cannot proliferate and the gastric lining gets thinner due to mucosal cell death. All these cause stress-induced gastric ulcer," explains Dr. Bandyopadhyay. "This is the first time we could find a link between the mind and mitochondria in the stomach. It is very exciting and fascinating."

Second brain

The stomach is one of the organs most severely affected by stress and this is due to the link between the stomach and the brain. Moreover, the stomach is also known as the body's second brain with a specialised neural network, repository of neurotransmitters and different kinds of nerve cells innervating the organ, though fewer in number. Plenty of corticosterone was released into the blood when the animals were subjected to stress. Once corticosterone gets inside mitochondria it reduces ATP production and respiration capacity. By using a drug that prevents corticosterone from binding to the receptor found inside the cell, the researchers were able to significantly prevent stomach injury in the animals. Interestingly, some common psychoactive drugs used in the study helped in preventing the pathological manifestations — gastric ulcer. "So we can say that it is indeed the acute mental stress which is causing gastric complications," says Rudranil De from IICB and first author of the paper.

Role of mitochondria

"We delved deeper to find out the involvement of mitochondria in stress-induced gastric damage," says De. A compound that scavenges harmful free radicals released from the malfunctioning mitochondria and another compound that inhibits mitochondrial fragmentation significantly prevented the injury and intra-gastric bleeding; although the drugs don't reportedly act on the brain. "Although stress is present, we could still prevent the damage caused to the stomach by targeting the mitochondria," says De. "The use of these two compounds acting directly on the mitochondria confirmed that acute mental stress damages the mitochondria of the stomach ultimately leading to tissue injury and haemorrhage." The use of tranquilisers and barbiturates, often prescribed to patients suffering from mental stress and disorders, are associated with inherent problems including withdrawal effects and long-term side effects. "Our study proposes an alternative line of therapeutic strategy which relies on salvaging mitochondrial damage, thereby providing significant protection from stress. This will help avoid the use of

existing psychoactive drugs while keeping the subjects alert," says Somnath Mazumder from IICB, one of the authors. If further research and human trials confirm the results seen in animal studies, it would lead to a new generation of anti-stress medications with minimal side effects which would aim at targeting the mitochondrial pathology to take care of a bigger psychosomatic health complication.

Published in:
The Hindu

IICT scientist receives NASI award

CSIR-IICT

6th January, 2018

CSIR-IICT's Debendra Kumar Mohapatra, Principal Scientist of Natural Products Chemistry Division, has been received the NASI-Reliance Industrial Platinum Jubilee Award 2017 for Application Oriented Innovations in the area of Physical Sciences from Maharashtra Governor C. Vidyasagar Rao at the 87th Annual Session of NASI held at Pune University, last month.

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The Times of India

Nobel laureate who gifted LED enlightens youth

CSIR-IICT

5th January, 2018

HYDERABAD: Telangana and Andhra Pradesh have overcome the perennial problem of power shortage after they shifted to LED lamps on a massive scale. And the man, who gave the world the highly power-saving LED lamps, is currently in Hyderabad delivering lectures to students and scientists. His visit, however, remains unsung with no official honour. Meet Prof Hiroshi Amano, the winner of Nobel Prize in 2014 in physics for inventing efficient blue lightemitting diodes (LED). His invention has resulted in bright and energy-saving white light sources. In fact, LED lamps are the sources of efficient lighting for the 21st century.

On Thursday, Prof Amano visited IICT in connection with the platinum jubilee year celebrations. He delivered an inspiring lecture on the new lighting sources and interacted with scientists and students. appreciating the important research work being carried out at CSIR-IICT, Prof Amano proposed that IICT and his research group at Akasaki Research Centre, Nagoya University, Japan, should join hands for further developments of advanced semiconducting materials.

IICT director S Chandrasekhar has readily agreed. "Creation of white light involves a combination of light spectrum or red, green and blue lights. However, Prof Amano has shown the world for the first time that a low power blue light alone is adequate for generating the complex white light," said an IICT statement here.

Prof Amano later demonstrated on the stage of CSIR-IICT auditorium how he had made the invention that had changed the very

concept of lighting. "His spectacular contribution has resulted in transformative electronics for the development of sustainable smart society," said Dr Chandrasekhar.

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Check dam to revive Karamana ghats

CSIR-NIIST

4th January, 2018

Thiruvananthapuram: The irrigation department is constructing a check dam across the Karamana River near the Dhobi Ghat. Besides reviving five ghats, the check dam and a biodiversity park are expected to turn the stretch near the NH bridge at Karamana into a picnic spot. The dam is being constructed as part of the Karamana River scientific management project (KRSM), with the support of Kerala State Council for Science, Technology and Environment (KSCSTE). The construction began after CSIR-NIIST conducted an environment impact study. The Rs 65-lakh check dam "will prevent the back flow of saline water from Poonthura pozhi, besides checking polluted water from Parvathy Puthanaar from entering the river," Surajith S R, assistant engineer of the irrigation department said. He added that the dam would also address the problem of pollution of water at the KWA's water supply project at Trikkanapuram. Once commissioned, the check dam would transform the water body like a lake, and it, along with the biodiversity park being developed by KRSM, would give a fillip to the area's tourism potential. "We have approached the tourism department to check the possibility of launching coracles or solar boats," Surajith said, adding that his department had accorded administrative sanction for the reconstruction of a bund road on the other side of the river. The Dhobi Ghat was recently revived under the project. Around 25 families, dependent on the ghat, were given restroom and other facilities as part of the project.

Published in:

The Times of India

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