Indian Science in Indian Media

Highlights of India Science Wire (ISW) stories

March 2019

India Science Wire - highlighting Indian science in Indian media

The coverage of science and technology particularly relating to research done in Indian research institutions, is generally very poor in Indian media. There are several reasons for this situation, one of them being the lack of credible and relevant science content. In order to bridge this gap, Vigyan Prasar launched a unique initiative - India **Science Wire (ISW)** – in January 2017.

The news service is dedicated to developments in Indian research laboratories, universities and academic institutions. Almost all news stories released by this service are based on research papers by Indian scientists published in leading Indian and foreign journals. All news stories and features are written and edited by a team of professional science journalists with decades of experience in science journalism.

News stories based on happenings in Indian research labs are released to media houses on a daily basis. These stories are also uploaded on ISW website and are simultaneously promoted though social media – Twitter and Facebook. At present, the service is available in English and Hindi.

Reach out ISW Editor with story ideas, comments and suggestions at indiasciencewire@gmail.com

ISW website: http://vigyanprasar.gov.in/isw/isw.htm

ISW stories released and published in March 2019

S.No	Story title	Date of release	Name of the writer
1	IMD forecasts above normal March to May temperatures over some parts of the country	March 1	Sunderarajan Padmanabhan
2	Database launched on flora in peninsular India	March 5	Sunderarajan Padmanabhan
3	How AI may help diagnose mental illnesses	March 6	P Surat
4	STI council leveraging S&T through nine societal missions	March 6	Sunderarajan Padmanabhan
5	AstroSat discovers new group of stars in globular cluster NGC 2808	March 7	Niruj Mohan Ramanujam
6	A new roll on to relieve period pain	March 8	Jyoti Singh
7	Local communities key in conservation of snow leopards: study	March 8	S Suresh Ramanan
8	Hyderabad scientists make magnetic graphene for Next Gen digital devices	March 11	Sivasubramani Santhosh
9	Scientists transform the bane of black soot into a boon for water purification	March 11	Rayies Altaf
12	Scientists solve genetic puzzle surrounding Mundas	March 12	Dinesh C Sharma
13	Climate vulnerability maps developed for Himalayan states	March 14	Dinesh C Sharma
14	IIT Kharagpur gets new high power computing facility	March 14	Sunderarajan Padmanabhan
15	Palm fossils suggest Tibet had high mountains and deep valleys	March 15	Dinesh C Sharma
16	Antibiotic resistant bacteria found in river water	March 18	Aditi Jain
17	Fishing and coral reef degradation threaten parrotfish in Andaman: study	March 18	Sanghamitra Deobhanj
18	New discovery paves way for ‘silicon of the future’	March 19	Dinesh C Sharma
19	Records of historical supernova found in Karnataka	March 22	B S Shylaja
20	Watch this season of IPL with a dash of data science from IIT	March 22	Jyoti Singh

21	New technique can make flexible electronics self-repairing too	March 25	Piyush Pandey
22	More nitrogen may help offset effect of climate change on wheat : study	March 26	S Suresh Ramanan
23	Giant LEAP to view materials -– one atom at a time	March 26	P Surat
24	Study finds gaps in conservation efforts in Western Ghats	March 27	S Suresh Ramanan
25	Vitamin deficiency widespread among healthy looking urban Indians	March 27	Monika Kundu Srivastava
26	Low soil moisture posing threat in most river basins	March 28	Umashankar Mishra
27	Gandhi: fitness freak, champion of sustainable food and a pioneering vegan	March 28	Dinesh C Sharma
28	‘Whispers of Wind’ on radio launched	March 29	Jyoti Singh

हिंदी

1	नेत्र कैंसर के उपचार में मददगार हो सकते हैं नए जैव संकेतक	March 1	उमाशंकर मिश्र
2	रक्तचाप और मधुमेह नियंत्रण में मददगार हो सकता है नया मोबाइल टूल	March 5	शुभ्रता मिश्रा
3	सरिस्का से कर सकेंगे अंतरिक्ष का दीदार	March 5	उमाशंकर मिश्र
4	प्राकृतिक रेशों से कंपोजिट प्लास्टिक बनाने की नई विधि विकसित	March 6	उमाशंकर मिश्र
5	एस्ट्रोसैट ने खोजा तारों के गोलाकार गुच्छे में सितारों का नया समूह	March 7	निरुज मोहन रामानुजम
6	हिम तेंदुओं के संरक्षण में मदगार हो सकती है सामुदायिक भागीदारी	March 8	एस. सुरेश रमणन
7	सात करोड़ वर्ष पहले पूर्वजों से अलग हो गई थी मेंढक की यह प्रजाति	March 12	उमाशंकर मिश्र
8	किडनी रोगों के नियंत्रण के लिए समग्र नीति जरूरी	March 14	उमाशंकर मिश्र
9	कर्नाटक में मिले ऐतिहासिक सुपरनोवा के अभिलेख	March 22	बी.एस. शैलजा
10	देश की नदी घाटियों में नहीं है सूखे से उबरने की क्षमता	March 25	उमाशंकर मिश्र
11	विटामिन की कमी से ग्रस्त हैं स्वस्थ दिखने वाले शहरी लोग	March 27	मोनिका कुंडू श्रीवास्तव
12	कुपोषण से हृदय रोग तक लड़ने में मदद कर सकते हैं गांधी के सिद्धांत	March 28	दिनेश सी. शर्मा
13	जलवायु परिवर्तन पर जागरूकता के लिए 19 भाषाओं में रेडियो धारावाहिक	March 29	उमाशंकर मिश्र

IMD Forecasts 'Above Normal' March to May Temperatures Over Some Parts of the Country

By Sunderarajan Padmanabhan | ISW | 01 March 2019 TWC India

Representational image: A woman shields her daughter's head from the scorching heat.

(Snehil Sakhare/BCCL/Aurangabad)

The India Meteorological Department has forecast that the March to May season average temperatures are likely to be above normal over the southern part of west coast and some areas in north-west and north-east India.

In its first report on seasonal outlook for temperatures during hot season (for the period from March to May)released here today, the country's apex weather agency said Uttarakhand could be the worst off.

In the Himalayan state, while the season averaged mean and the minimum temperatures are likely to be 0.5 degree Celsius to one degree Celsius above normal, the season averaged maximum temperature is likely to be worse, at more than one degree Celsius above normal.

Uttarakhand could be followed by Himachal Pradesh, West Rajasthan, coastal Karnataka, Kerala and Arunachal Pradesh. Here, the situation could be better than the hilly State but not as good as compared to the rest of the country. In these States, all the three parameters – season averaged mean, maximum and minimum temperatures are likely to be 0.5 degree Celsius to one degree Celsius above normal.

It could be a mixed bag in Konkan and Goa. In this region on the west coast, the season averaged maximum temperatures are likely to be 0.5 degree Celsius to one degree Celsius above normal. However, the season averaged mean and minimum temperatures would be near normal.

The situation could be reverse in Saurashtra, Tamil and coastal Andhra Pradesh. In these areas,the season averaged minimum temperatures are likely to be 0.5 degree Celsius to one degree Celsius above normal, while season averaged mean and maximum temperatures are likely to be near normal.

The report on the seasonal outlook has also noted that this year there may not be much change in the number of heat wave spells in the core heat wave zone, which covers Punjab, Delhi, Haryana, Uttar Pradesh, Madhya Pradesh, Gujarat, Chattisgarh, Bihar, Jharkhand, West Bengal, Odisha and Telengana, besides Uttarakhand, Himachal Pradesh, and Rajasthan.

Additional Director General of IMD and Head of Services, Dr. M.Mahapatra, said the meteorological sub-divisions in the region witness an average of about five heat wave episodes during the three months. Similar number of episodes is likely this year also. IMD declares heat wave conditions whenever the temperatures go five degrees above normal or whenever the temperatures cross 42 degrees Celsius irrespective of the departure from the mean.

Speaking to India Science Wire, IMD Director General, K.J.Ramesh, said an updated outlook will be issued next month for the period from April to June. IMD has been issuing seasonal forecast outlook for sub-division scale temperatures over the country for both hot and cold weather seasons since 2016.

This article was originally published in India Science Wire

THE MEGHALAYA GUARDIAN

Science

IMD forecasts above normal March to May temperatures over some parts of the country

07-03-2019

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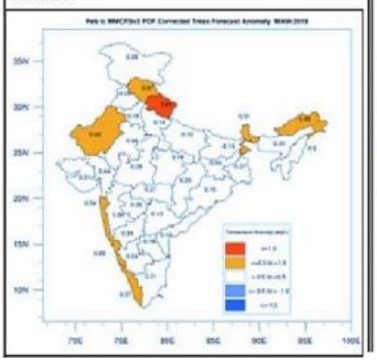

Season averaged maximum temperature anamoly for March to May 2019

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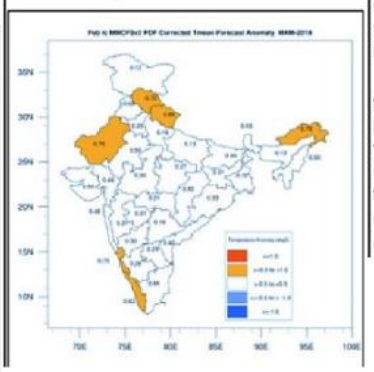

Season averaged mean temperature anomaly for March to May 2019

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प्रभा साक्षी

नेत्र कैंसर के उपचार में मददगार हो सकते हैं नए जैव संकेतक

By उमाशंकर मिश्र | Publish Date: Mar 5 2019 5:15PM

शोधकर्ताओं का कहना है कि ये कोशिकाएं कैंसर के विभिन्न रूपों का पता लगाने के लिए आदर्श जैव संकेतक (बायोमार्कर) हो सकती हैं। एक अन्य उपयोगी तथ्य यह भी उभरकर आया है कि कैंसर कोशिकाओं में कोलेस्ट्रॉल को कम-संश्लेषित किया जाता है।

नई दिल्ली। (इंडिया साइंस वायर): भारतीय शोधकर्ताओं ने नेत्र कैंसर से ग्रस्त कोशिकाओं के प्रसार के लिए जिम्मेदार कारकों का पता लगाया है, जिससे रोगग्रस्त कोशिकाओं को ऊर्जा मिलती है। शोधकर्ताओं का कहना है कि इस अध्ययन से कैंसर के उपचार के लिए दुष्प्रभाव रहित दवाएं विकसित करने और निदान के सुरक्षित तरीकों के विकास में मदद मिल सकती है। कैंसर कोशिकाओं को लंबी श्रृंखला वाले फैटी एसिड का उत्पादन करते भी देखा गया है। शोधकर्ताओं का कहना है कि ये कोशिकाएं कैंसर के विभिन्न रूपों का पता लगाने के लिए आदर्श जैव संकेतक (बायोमार्कर) हो सकती हैं। एक अन्य उपयोगी तथ्य यह भी उभरकर आया है कि कैंसर कोशिकाओं में कोलेस्ट्रॉल को कम-संश्लेषित किया जाता है।

इस अध्ययन में पाया गया है कि सामान्य कोशिकाओं द्वारा इस्तेमाल किए जाने वाले कार्बोहाइड्रेट और फैटी एसिड के बजाय कैंसर कोशिकाएं ऊर्जा के लिए अमीनो अम्ल का उपयोग करती हैं। इसी तरह, रेटिनोब्लास्टोमा कोशिकाएं सिग्नलिंग और झिल्ली गठन के लिए फैटी एसिड को विशेष रूप से संश्लेषित करती हैं।

कैंसरग्रस्त कोशिकाओं की कार्यप्रणाली का अध्ययन करने के लिए कांस्ट्रेन्ड-बेस्ड मॉडलिंग (सीबीएम) नामक कंप्यूटर तकनीक का उपयोग किया गया है। शोधकर्ताओं ने रेटिनोब्लास्टोमा कोशिकाओं का अध्ययन इसी तकनीक की मदद से किया है।

अध्ययन में स्वस्थ एवं रेटिनोब्लास्टोमा कोशिकाओं और कैंसर के प्रकारों के बीच अंतर की पहचान की गई है। सीबीएम तकनीक की मदद से जैविक प्रणाली के भौतिक-रासायनिक, पर्यावरणीय और टोपोलॉजी अवरोधों का कंप्यूटर आधारित गणितीय विश्लेषण किया जाता है और अनुवांशिक एवं जैव-रसायनिक गुणों का पता लगाया जाता है।

शोधकर्ताओं ने तुलनात्मक अध्ययन के लिए सामान्य रेटिना और रेटिनोब्लास्टोमा के नमूनों का उपयोग किया है। कॉर्नियल ट्रांसप्लांटेशन के बाद सामान्य रेटिना के नमूने स्वस्थ कैडेवरिक आंखों से एकत्र किए गए हैं। जबकि, रेटिनोब्लास्टोमा ट्यूमर के नमूने रोगग्रस्त बच्चों के माता-पिता की सहमति से प्राप्त किए गए हैं।

बचपन में होने वाले नेत्र कैंसर, जिसे रेटिनोब्लास्टोमा कहते हैं, को केंद्र मे रखकर यह अध्ययन किया गया है। रेटिनोब्लास्टोमा एक या फिर दोनों आंखों को प्रभावित कर सकता है। भारत में बच्चों के रेटिनोबलास्टोमा के करीब 1,500 नए मामले हर रोज सामने आते हैं।

भारतीय प्रौद्योगिकी संस्थान (आईआईटी), मद्रास, चेन्नई के शंकर नेत्रालय और अमेरिका के मैसाचुसेट्स जनरल हॉस्पिटल कैंसर सेंटर ऐंड हार्वर्ड मेडिकल स्कूल के शोधकर्ताओं द्वारा यह अध्ययन संयुक्त रूप से किया गया है। अध्ययन के नतीजे शोध पत्रिका एफईबीएस लेटर्स में प्रकाशित किए गए हैं।

इस अध्ययन से जुड़ीं आईआईटी-मद्रास की शोधकर्ता डॉ. स्वागतिका साहू ने बताया कि “कैंसर उपचार के अक्सर गहरे दुष्प्रभाव होते हैं। कैंसर-रोधी दवा स्वस्थ कोशिकाओं को प्रभावित किए बिना रोगग्रस्त कोशिकाओं तक पहुंचनी चाहिए, जिससे गंभीर दुष्प्रभावों से बचा जा सके। कैंसर उपचार के लिए सुरक्षित दवाओं की खोज कोशिकाओं की कार्यप्रणाली के बारे में हमारे ज्ञान पर निर्भर करती है, जिससे रोगग्रस्त कोशिकाएं बढ़ती रहती हैं।”

इस अध्ययन से जुड़े एक अन्य शोधकर्ता डॉ. कार्तिक रमन ने बताया कि “कम्प्यूटर आधारित मॉडलिंग कोशिकाओं की कार्यप्रणाली के बारे में हमारी समझ को बढ़ा सकती है। जैविक प्रणालियों के आंकड़ों के साथ

कंप्यूटर मॉडलिंग की मदद से कोशकीय कार्यप्रणाली का सटीक रूप से अनुकरण कर सकते हैं। इस तरह कोशिकाओं की अवांछित कार्यप्रणालियों को बाधित करने के तरीकों की पहचान करने में मदद मिल सकती है।"

अध्ययनकर्ताओं की टीम में आईआईटी-मद्रास के डॉ. कार्तिक रमन, डॉ. स्वागतिका साहू और ओंकार मोहिते के साथ शंकर नेत्रालय की डॉ. शैलजा वी. एल्चुरी, रंजीत कुमार, रवि कुमार, विकास खेतान, पुखराज ऋषि, शुग्नेश्वरी गणेशन, कृष्ण कुमार सुब्रमण्यम, मेडाजिनोम लैब्स, बंगलूरू के कार्तिकेयन शिवरामन और अमेरिका के मैसाचुसेट्स जनरल हॉस्पिटल कैंसर सेंटर ऐंड हार्वर्ड मेडिकल स्कूल के वेन माइल्स एवं ब्रेंडन निकोले शामिल थे। यह अध्ययन विज्ञान और प्रौद्योगिकी विभाग, जैव प्रौद्योगिकी विभाग तथा विज्ञान और इंजीनियरिंग अनुसंधान बोर्ड के अनुदान पर आधारित है।

(इंडिया साइंस वायर)

THE HINDU BusinessLine

Database launched on flora in peninsular India

Sunderarajan Padmanabhan New Delhi | Published on March 05, 2019

The Centre for Ecological Sciences (CES) at Bengaluru-based Indian Institute of Science has launched an online database of peer-reviewed information on over 10,000 plant species in peninsular India.

Called `Digital Flora of Peninsular India', it draws on information available in the herbarium housed at the Centre. The herbarium was founded by taxonomist and filed biologist Dr Cecil .J. Saldanha, who had collected these specimens during his explorations of Karnataka's flora. The Indian Institute of Science had acquired it after his retirement.

Dr. K Sankara Rao, herbarium in-charge and retired professor of the Department of Biochemistry, decided to develop the online database when he took charge in 2007. He put together a team of volunteers, who digitized and compiled records of the plant specimens.

The database contains comprehensive information about each plant species: its vernacular name, taxonomic description, habitat, geographic distribution, flowering time, conservation status and more.

An official press release from IISc noted that that Dr. Rao and his team had also carried out extensive ecological surveys to ensure that the information provided on the website is accurate and up-to-date. The exercise was conducted since collections were over 30 years old and there could be lot of changes in species diversity in a habitat. The website also features photographs taken from the team's field trips and scanned images of the herbarium specimens.

The work started with digitising the flora of Karnataka, but was later expanded to cover other states through which the Western and Eastern ghats run. The teamspent four years to collect, process and upload the information. Now it is working to include information on plant diversity from parts of north-central India and information about mosses and lichens. (India Science Wire)

Twitter handle: @ndpsr

Published on March 05, 2019

राष्ट्रीय संस्करण

दैनिक जागरण

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बीपी व डायबिटीज नियंत्रण में मदद करेगा नया मोबाइल टूल

वास्को-द-गामा (गोवा), आइएसडब्ल्यू : भारतीय शोधकर्ताओं ने आर्टिफिशियल इंटेलीजेंस (एआइ) और ऑटोमेशन आधारित नई तकनीक विकसित की है, जिसके उपयोग ब्लड प्रेशर (बीपी) और डायबिटीज की पहचान तथा नियंत्रण में मदद मिल सकती है।

इस मोबाइल आधारित टूल को हैदराबाद स्थित मेडिसिटी इंस्टीट्यूट ऑफ मेडिकल साइंसेज, सोसायटी फॉर हेल्थ एलाइड रिसर्च ऐंड एजुकेशन तथा तिरुवनंतपुरम के श्री चित्रा तिरुनल इंस्टीट्यूट फॉर मेडिकल साइंसेज एंड टेक्नोलॉजी के शोधकर्ताओं ने विकसित किया है। इस टूल की उपयोगिता के अध्ययन के लिए तेलंगाना के मेडचल जिले के दो गांवों में लगभग 2000 लोगों में हृदय रोगों के लिए जिम्मेदार दो प्रमुख कारणों हाई ब्लड प्रेशर और डायबिटीज की जांच की गई है। इसमें पता चला कि 50 फीसद लोगों को हाई ब्लड प्रेशर और 25 फीसद लोगों को डायबिटीज से ग्रस्त होने की जानकारी पहले नहीं थी। दो वर्षों तक इस टूल के उपयोग से हाई ब्लड प्रेशर से पीड़ित 54 फीसद मरीजों का ब्लड प्रेशर नियंत्रित हुआ है। इसी तरह, 34 प्रतिशत डायबिटीज रोगियों की रक्त शर्करा में भी सुधार देखा गया है।

मिलेगी मदद

- भारतीय शोधकर्ताओं को मिली एआइ और ऑटोमेशन आधारित नई तकनीक विकसित करने में सफलता

इस अध्ययन के दौरान गांवों में आशा कार्यकर्ताओं को एम-हेल्थ नामक टूल, स्फिग्मोमैनोमीटर और ग्लूकोमीटर का उपयोग करने के लिए प्रशिक्षित किया गया था। कार्यकर्ताओं को मरीजों तथा चिकित्सकों के बीच स्काइप साक्षात्कार कराने के लिए भी प्रशिक्षण दिया गया है।

आशा कार्यकर्ताओं को एम-हेल्थ टूल एप्लिकेशन इंस्टॉल किया हुआ टैबलेट कंप्यूटर और अन्य उपकरण दिए गए थे। इन उपकरणों को टैबलेट कंप्यूटर से जोड़ा जाता है, जिससे मरीजों के हेल्थ परिणाम अपने आप रिकार्ड होते हैं। चिकित्सक इन रिकार्डों का अध्ययन करके वीडियो कांफ्रेंसिंग के माध्यम से मरीजों तक दवाओं का ई-पर्चा पहुंचाते हैं। निश्चत समय अंतराल पर कार्यकर्ता, चिकित्सक और रोगी इंटरनेट के जरिये संपर्क में बने रहते हैं।

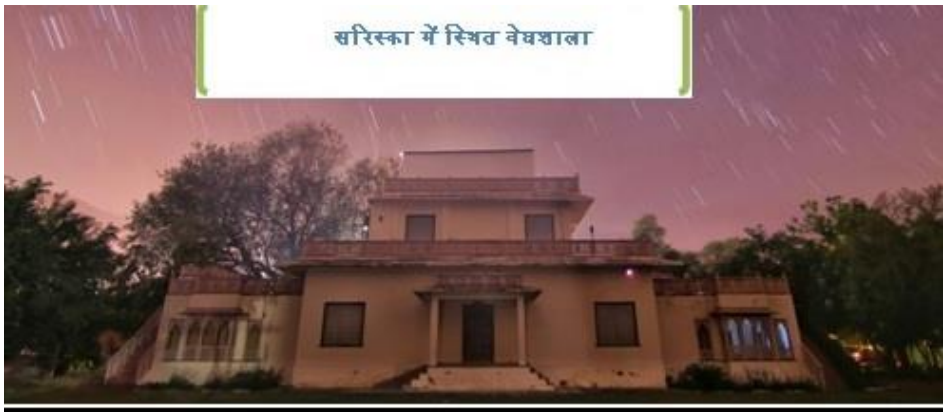
इस अध्ययन से जुड़े प्रमुख शोधकर्ता डॉ. शैलेंद्र डेंदगे ने बताया, 'यह टूल निश्चत रणनीति के तहत काम करने वाला कंप्यूटर विंडोज एप्लिकेशन है। यह प्रशिक्षित कार्यकर्ताओं, स्वचालित चिकित्सा उपकरणों, टैबलेट कंप्यूटर, इंटरनेट सर्वर और वायरलेस प्रिंटर के सम्मिलित सहयोग से काम करता है। क्षेत्रों में गुणवत्तापूर्ण स्वास्थ्य देखभाल सेवाएं प्रदान करने में यह टूल महत्वपूर्ण हो सकता है।'

श्री चित्रा तिरुनल इंस्टिट्यूट फॉर मेडिकल साइंसेज ऐंड टेक्नोलॉजी के वरिष्ठ शोधकर्ता डॉ. पी. जीमॉन ने बताया कि 'यह तकनीक रोगियों की स्वास्थ्य संबंधी जानकारियों को डिजिटल करने में उपयोगी हो सकती है। इसकी मदद से हाई ब्लड प्रेशर और डायबिटीज की जांच तथा नियंत्रण के लिए मजबूत स्वास्थ प्रणाली बनायी जा सकेगी। यह शोध देश के दूरस्थ अंचलों में बसे ग्रामीणों में हाई ब्लड प्रेशर और डायबिटीज आधारित हृदय रोगों से बचाव और मृत्यु दर कम करने के लिए भावी अनुसंधान का मंच प्रदान करता है। इस तकनीक का उपयोग स्वास्थ्य सेवाएं प्रदान करने के लिए भी किया जा सकता है।' अध्ययनकर्ताओं में डॉ. शैलेंद्र डेंदगे और डॉ. पी. जीमॉन के अलावा अमेरिका की यूनिवर्सिटी ऑफ पिट्सबर्ग में कार्यरत डॉ. पी.एस. रेड्डी भी शामिल थे। यह अध्ययन शोध पत्रिका प्लॉस वन में प्रकाशित किया गया है।

स्पंदन फीचर्स
विकास की बात सबके साथ

सरिस्का से कर सकेंगे अंतरिक्ष का दीदार

उमाशंकर मिश्र |



शहरों में वायु और प्रकाश प्रदूषण की वजह से रात में आसमान में सितारों को देखना कठिन हो गया है। इसीलिए वैज्ञानिकों द्वारा उपयोग की जाने वाली वेधशालाएं दूरदराज के क्षेत्रों में स्थापित की गई हैं। दूर होने के

साथ-साथ ये वेधशालाएं आम लोगों के लिए उपलब्ध नहीं हो पाती हैं। इन्हीं कमियों को दूर करने के लिए एक नई वेधशाला की शुरुआत सरिस्का बाघ अभ्यारण्य के पास अरावली की पहाड़ियों में की गई है। यहां आकर आम लोग भी आकाश गंगा, निहारिकों, ग्रहों और तारों से मुलाकात कर सकते हैं।अंतरिक्ष की कहानियों के साथ यहां नक्षत्रों को देखने का सिलसिला शाम ढलने के साथ शुरू होता है, जो रात भर चलता रहता है। मंगल, शुक्र और बृहस्पति जैसे ग्रह, आकाशीय चमत्कार, ओरियन नेबुला, एंड्रोमेडा, सॉल्ट ऐंड पेपर समूह और प्लीडीज तारा समूह, जिसे हम कृतिका नक्षत्र कहते हैं, को भीवेधशाला में टेलीस्कोप की मदद से देखसकते हैं।

यहां पर वायु एवं प्रकाश प्रदूषण रहित आसमान में बिखरे सितारे और तारों के समूह में छिपी आकृतियों को देखना एक रोमांचक अनुभव होता है।एस्ट्रोनॉमी इवेंट्स, खगोलीय ज्ञान पर आधारित इंटरैक्टिव सत्र, अंतरिक्ष विज्ञान से संबंधित प्रदर्शनी और रात में एस्ट्रोफोटोग्राफी से यह अनुभवयादगार बन जाता है। सबसे पहले एस्ट्रोफोटोग्राफी से जुड़े उपकरणों और तकनीक से परिचय कराया जाता है।सुबह की आकाशीय यात्रा में शनि और उसके छल्ले, बृहस्पति और उसके चंद्रमा, रिंग नेबुला, डंबल नेबुला और ग्रेट हरक्यूलिस ग्लोब्युलर क्लस्टर आदि टेलीस्कोप के जरिये देखे जा सकते हैं।

इस अनुभव को वेधशाला में लगाया गया आठ इंच का गोटो टेलिस्कोप आकर्षक बना देताहै। इसकी मदद से आकाशगंगाओं, नेबुला, तारा-समूह, ग्रहों और चंद्रमा को देखा जा सकता है। अंतरिक्ष और खगोल संग्राहलय भी इस वेधशाला का हिस्सा हैं। पर्यटकों और छात्रों के अलावा यह वेधशाला शोधकर्ताओं के लिए भी उपयोगी हो सकती है। यह वेधशाला दिल्ली से करीब 200 किलोमीटर की दूरी पर मौजूद है। अरावली की खूबसूरत वादियों में अलवर-जयपुर रोड पर आमोद समूह के अलवर बाग रिसॉर्ट में प्रदूषित हवा और प्रकाश प्रदूषण से मुक्त स्थान पर इसे स्थापित किया गया है।

सरिस्का में स्थापित यह एक निजी क्षेत्र की वेधशाला है, जो स्टारगेट समूह की पहल पर स्थापित की गई है। स्टारगेट समूह देशभर में चुनिंदा जगहों पर ऐसी वेधशालाओं की श्रृंखला बना रहा है। सरिस्का में स्टारगेट द्वारा यह दूसरी वेधशाला स्थापित की गई है। इससे पहले, वर्ष 2016 में हिमाचल प्रदेश के कौसानी इसी तरह की वेधशाला शुरू की गई थी। स्टारगेट से जुड़े अंतरराष्ट्रीय ख्याति प्राप्त एस्ट्रो-फोटोग्राफर अतीश अमन ने बताया कि “धरती पर संसाधनों की जरूरतें जिस तरह से बढ़ रही हैं, उसे पूरा करने में अंतरिक्ष से मदद मिल सकती है। इस दिशा में दुनियाभर के वैज्ञानिक निरंतर कार्य कर रहे हैं। नई पीढ़ी को इस रोमांचक दुनिया से जोड़ने में इस तरह की पहल उपयोगी हो सकती है।यहां आकर अंतरिक्ष विज्ञान के महत्व को करीब से समझा जा सकता है।”

इस समूह के संस्थापकों में शामिल विज्ञान लेखक-प्रसारक वाई.एस. गिल ने बताया कि “भारत में अधिकतर वेधशालाएं खगोलीय अनुसंधान को ध्यान में रखकर सरकारी संस्थानों द्वारा स्थापित की गई हैं, जहां आम लोग नहीं जा पाते। यह वेधशाला आम लोगोंके लिए खुली है, जहां पर्यटक, छात्र, फोटोग्राफर्स और शोधकर्ता काफी संख्या में आ रहे हैं।”(इंडिया साइंस वायर)

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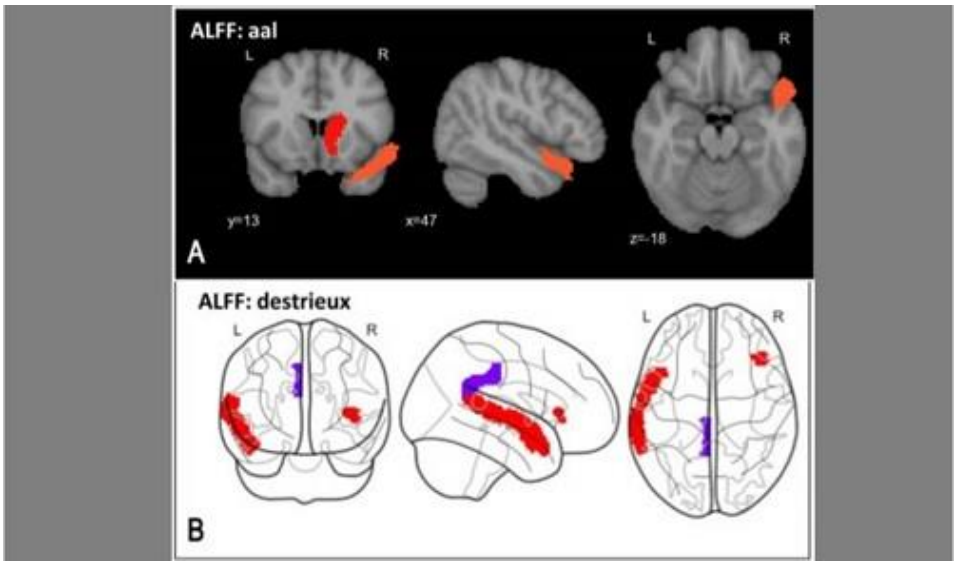
AI may help diagnose mental illnesses

India Science Wire 6 March 2019 9:26 PM

Indian and Canadian researchers develop a machine learning-based tool to diagnose schizophrenia with high accuracy. The model has been named "EMPaSchiz" or 'Ensemble algorithm with Multiple Parcellations for Schizophrenia prediction'. However, the present research is in the nascent stage and more research is needed on the model to generate a user-friendly software.



Bengaluru (ISW) - Artificial Intelligence is finding new applications in a range of fields. Now researchers from India and Canada have developed a machine learning-based tool that can diagnose schizophrenia with high accuracy.

Although research on major psychiatric illnesses has been going on for decades, there are still no reliable methods to predict and diagnose many ailments. One of reasons is the inherent variability in biological systems. Schizophrenia is a debilitating psychotic illness where diagnosis is often difficult due to its numerous clinical forms and considerable overlap with other psychiatric disorders.

Researchers at the National Institute of Mental Health and Neurosciences (NIMHANS), Bengaluru used functional MRI (fMRI), a method in which magnetic field

is used to map and measure brain activity. With this, they measured brain activity in 93 healthy and 81 schizophrenia patients.

Most previous studies had smaller groups of people which may not capture variabilities in the symptoms. In addition, patients were already undergoing therapy and taking anti-psychotic drugs that is known to alter brain activity. In the new study, patients who had not been exposed to drugs were included. This reduced possibility of errors due to effects of drugs.

Brain information was obtained from fMRI during the resting stage. Researchers divided the whole brain into different regions or parcels. This was done in 14 different ways based on similarities in volume, surface, connectivity etc. From each method of dividing the brain, information was derived on three features based on the region and three features based on connectivity of the brain. These parameters included frequency of brain waves, correlation between brain activity of closely-placed regions, and connectivity between different brain regions. These features were chosen as previous studies show they are altered in a schizophrenic brain.

This helped researchers collate 84 points of data (from 14 brain division schemes, and 6 features extracted from each scheme) from each subject. Using these data points from healthy and schizophrenic patients, the group has built a model that could predict schizophrenia with an accuracy of 87%. The model has been named "EMPaSchiz" or 'Ensemble algorithm with Multiple Parcellations for Schizophrenia prediction'.

"The classification accuracy our model outperforms earlier machine learning models built for diagnosing schizophrenia using resting state fMRI on large samples," said Ganesan Venkatasubramanian, a member of the research team.

More research is needed on the model before user-friendly software can be generated, he added. He hoped that such automated and semi-automated diagnostic tools could be developed for detecting other kinds of mental disorders and help predict treatment strategies.

The research team included scientists from NIMHANS and Alberta Machine Intelligence Institute, University of Alberta, Canada. This study has been published in journal Schizophrenia.

Source: India Science Wire

Illustration courtesy: **India Science Wire**

Research Stash

STI Council Leveraging S&T Through Nine Societal Missions

Research Stash News March 6, 2019

As part of an exercise to leverage scientific research for societal benefits, the Prime Minister's Science, Technology and Innovation Council have taken up nine mission mode projects in areas ranging from biodiversity to artificial intelligence (AI).

The national biodiversity mission is working on comprehensive documentation of the country's biodiversity and development of professionals to handle environmental data for management and monitoring of biodiversity. The aim is to expand knowledge in ecosystem functioning to help restoration efforts and help build a biodiversity-based economy.

The goal of the mission on waste-to-wealth is to identify, develop and deploy technologies for better use of waste. It is designed to assist the Swachh Bharat and Smart Cities projects by leveraging science, technology, and innovation to create circular economic models.

The mission on deep ocean exploration focuses on better understanding of deeper parts of the seas around the country with a view to harness living and non-living resources that still remain untapped. Information gathered from the mission is, among other things, expected to help address issues arising from changes in the ocean due to climate change.

There is also a mission that focussed on a genomic study to identify and unravel genetic basis and prevalence of rare and inherited diseases with a view to stimulating better diagnosis and treatment and a mission to take research in the area of electric vehicles to a

new level. It focussed on developing vehicle sub-systems and components for Indian requirements including rare earth-based electric motors, and Lithium-ion batteries.

In addition, the council is working on a mission to enable access to teaching and researching materials in different areas of science and technology in various Indian languages through a combination of machine and human translation. The aim is to ensure that progress in science and technology is accessible to all. An eco-system for this is being established with the involvement of State Government agencies and startups who will work with scientists and build the implementable solution.

Further, it is working on a mission that will give a thrust to development of quantum computers, quantum chemistry, quantum communication, and quantum sensors and another to create new knowledge and develop and deploy applications in the area of artificial intelligence.

Addressing a press conference here, Principal Scientific Adviser to the Government and Chairperson of the Council, Prof. K.Vijay Raghavan, said new policies and programmes are being implemented to build on India's rich cultural and traditional practices and to position India as a pioneer in cutting edge areas of science and technology. "The aim is to help create a modern yet inclusive society", he said. (India Science Wire)
By Sunderarajan Padmanabhan

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तलाशी राह

आइआइटी मंडी के शोधकर्ताओं को मिली सफलता, माइक्रोवेव ऊर्जा के उपयोग से कंपोजिट प्लास्टिक में जूट और पटसन के रेशों को मिश्रित कर इसके गुणों में किया गया सुधार

कंपोजिट प्लास्टिक बनाने की नई विधि विकसित

नई दिल्ली, आइएसडब्ल्यू : बढ़ती पर्यावरणीय चुनौतियों को देखते हुए दुनियाभर में ईको-फ्रेंडली पदार्थों के विकास पर जोर दिया जा रहा है। इसी दिशा में भारतीय शोधकर्ताओं को बड़ी सफलता हाथ लगी है। दरअसल, शोधकर्ताओं ने जूट और पटसन जैसे प्राकृतिक रेशों के उपयोग से पर्यावरण अनुकूल कंपोजिट प्लास्टिक का निर्माण किया है।

भारतीय प्रौद्योगिकी संस्थान (आइआइटी), मंडी के शोधकर्ताओं द्वारा विकसित यह पॉलीप्रोपाइलीन और पॉलीएथिलीन आधारित कंपोजिट प्लास्टिक है। माइक्रोवेव ऊर्जा के उपयोग से इस कंपोजिट प्लास्टिक में जूट और पटसन के रेशों को मिश्रित करके इसके गुणों में सुधार किया गया है। प्राकृतिक रेशों की मदद से कंपोजिट प्लास्टिक बनाना काफी चुनौतिपूर्ण होता है। इसके लिए रेशों को पॉलिमर सांचे में वितरित करके उच्च तापमान पर प्रसंस्कृत किया जाता है। असमान ताप वितरण, सीमित प्रसंस्करण क्षमता, लंबी उत्पादन प्रक्रिया, अधिक ऊर्जा खपत और उच्च लागत जैसी बाधाएं उत्पादन को कठिन बना देती हैं। इसके अलावा, लंबी हीटिंग प्रक्रिया के दौरान प्राकृतिक रेशों का स्थिर नहीं रहना भी एक समस्या है। रेशों से युक्त कंपोजिट प्लास्टिक का उपयोग एयरोस्पेस प्रणालियों से लेकर ऑटोमोबाइल्स, उद्योगों और विभिन्न उपभोक्ता उत्पादों

में होता है। रेशों से बने कंपोजिट प्लास्टिक आमतौर पर उपयोग होने वाली धातुओं से हल्के होते हैं। कंपोजिट प्लास्टिक के उत्पादन के लिए आमतौर पर ग्लास एवं कार्बन रेशों का उपयोग होता है, जो इसे महंगा बना देते हैं। इसके अलावा, ये रेशे अपघटित नहीं होते और पर्यावरण को नुकसान पहुंचाते हैं। इसी कारण प्लास्टिक को मजबूती प्रदान करने के लिए वैज्ञानिक जूट और पटसन जैसे प्राकृतिक रेशों पर अध्ययन करने में जुटे हैं।

इस अध्ययन का नेतृत्व कर रहे शोधकर्ता डॉ. सन्नी जफर ने बताया कि प्राकृतिक रेशों के उपयोग से पॉलिमर संरचना को बांधकर मजबूत बनाया जा सकता है और उसके गुणों में बढ़ोतरी की जा सकती है। माइक्रोवेव ऊर्जा को तेजी से गर्म होने के लिए जाना जाता है। इसे लैब में बेहतर उत्पादों के विकास के लिए भी उपयोगी पाया गया है। माइक्रोवेव की मदद से त्वरित हीटिंग प्रक्रिया के जरिये रेशों को विघटित किए बिना कंपोजिट प्लास्टिक का निर्माण किया जा सकता है।

ग्रीनहाउस गैसों का उत्सर्जन कम करने में मिलेगी मदद

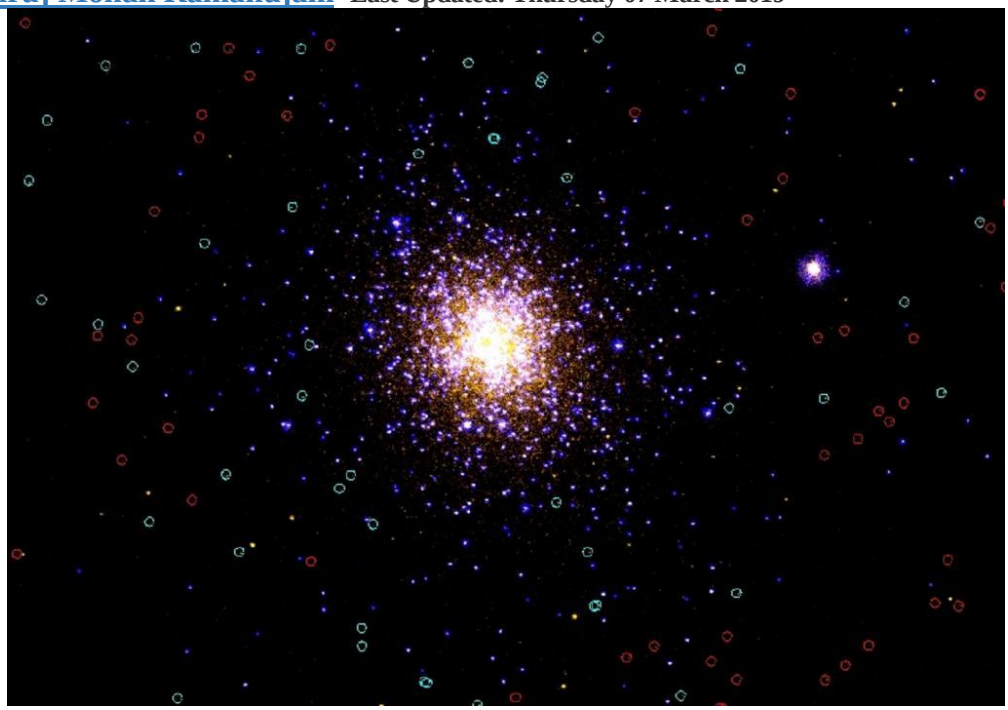
अध्ययनकर्ताओं में शामिल आइआइटी मंडी के शोधार्थी मनोज कुमार सिंह ने बताया कि प्लास्टिक के अन्य रूपों की अपेक्षा प्राकृतिक रेशों से युक्त प्लास्टिक आसानी से अपघटित हो सकते हैं। इस तरह के प्लास्टिक के उत्पादन से ग्रीनहाउस गैसों का उत्सर्जन कम करने में भी मदद मिल सकती है। भारत में विभिन्न प्राकृतिक रेशे प्रचुर मात्रा में उपलब्ध हैं, जो कंपोजिट प्लास्टिक के उत्पादन में उपयोगी हो सकते हैं। शोधकर्ताओं का कहना है कि इस प्रक्रिया से प्राप्त कंपोजिट प्लास्टिक पारंपरिक प्रक्रियाओं से उत्पादित कंपोजिट सामग्री के समान ही हैं। स्कैनिंग इलेक्ट्रॉन माइक्रोस्कोपी, एक्स-रे डिफ्रेक्शन जैसे तरीकों द्वारा कंपोजिट प्लास्टिक के गुणों का विश्लेषण और यूनिवर्सल टेस्टिंग मशीन का उपयोग करके इसके यांत्रिक गुणों का मूल्यांकन किया गया है। यह अध्ययन शोध पत्रिका थर्मोप्लास्टिक कंपोजिट मैटेरियल्स में प्रकाशित किया गया है।

DownToEarth

AstroSat discovers new group of stars in globular cluster NGC 2808

The team was able to identify over 2,000 individual stars in images taken through various ultraviolet filters

By Niruj Mohan Ramanujam **Last Updated: Thursday 07 March 2019**



The Indian multi-wavelength space observatory AstroSat, launched in September 2015, continues to yield exciting results. Using this observatory, astronomers from Thiruvananthapuram and Mumbai have identified a new population of ultraviolet stars in the globular cluster NGC 2808.

Globular clusters are collections of thousands to millions of stars, moving as one unit. These stars are tightly held together by gravity of the cluster itself, and are believed to

have formed together at roughly the same time. Some globular clusters could be among the oldest objects in our Milky Way, which hosts over 150 of them.

Stars are born, evolve, and then die. However, the timescales for this evolution are unimaginably large. “Massive stars evolve faster, over few million years and die in a spectacular fashion. However, stars like our Sun or even less massive ones, evolve slowly over billions of years,” explained Rashi Jain, an MSc student at Indian Institute of Space Science and Technology (IIST), Thiruvananthapuram, and a member of the research team.

Since a globular cluster contains stars with a variety of masses but with similar chemical composition, a snapshot of it could reveal stars of different masses at different stages of their evolution. The Sun will, after 5 billion years, expand to become a red giant star and go through some of these stages.

Stars which are more massive than the Sun will undergo different evolutionary paths, and will be much brighter in the ultraviolet range since they are hotter. Hence globular clusters are good laboratories to test theories of stellar evolution.

NGC 2808 is one of the most massive globular clusters that we know of, and is located at a distance of 47,000 light years from us. This cluster was observed by the team of researchers using the UltraViolet Imaging Telescope (UVIT) on-board AstroSat.

“We wanted to get a UV perspective of different populations of stars in globular clusters and UVIT provided us that opportunity,” said Prof Sarita Vig from IIST who led the research effort.

The team was able to identify over 2,000 individual stars in images taken through various ultraviolet filters. “Using their brightness in each of the filters, we could estimate the temperature of these hot stars that are ultraviolet-bright, which in turn allowed us to

segregate them into distinct groups of stars," added Swarna Ghosh from the Tata Institute of Fundamental Research, a co-author on the paper.

Contrary to normal assumption that all stars in such clusters are of the same age, recent studies have shown that many globular clusters may well host more than one population of stars. These seem to differ from each other in their chemical makeup.

The origin of this difference is still not well understood, though there is a prevalent theory that explains much of this data. NGC2808 is special since optical observations tell us that it may have at least five different populations of stars.

Using the combination of ultraviolet filters on UVIT, researchers attempted to segregate various groups of hot stars and were able to identify stars in each evolutionary stage, as expected.

However, they also found, for the first time, that a class of evolved stars called, Red Horizontal Branch, actually consists of two distinct groups. Since locations of the stars on the sky are known, they could carefully look at how these different classes of stars were located within the cluster.

Their analysis points to a disagreement with the widely accepted model of how a cluster acquires multiple populations of stars.

Taking advantage of the superior resolution of UVIT combined with its multiple filters, similar studies of individual stars of other globular clusters can lead astronomers to understand how these stellar populations formed in such clusters. The results of the study will be published in the *Monthly Notices of the Royal Astronomical Society*.

(India Science Wire)

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एस्ट्रोसैट ने खोजा सितारों का नया समूह

नई खोज ▶ 2015 में प्रक्षेपित की गई भारतीय अंतरिक्ष वेधशाला दे रही नई जानकारियां

एनजीसी – 2808 में पराबैंगनी तारों की एक नई श्रेणी का पता लगाया

पुणे, आइएसडब्ल्यू: सितंबर 2015 में प्रक्षेपित की गई भारतीय मल्टी वेवलेंथ अंतरिक्ष वेधशाला 'एस्ट्रोसैट' निरंतर रोमांचक जानकारियां दे रही है। इस वेधशाला का उपयोग करते हुए तिरुवनंतपुरम और मुंबई के खगोलविदों ने तारों के गोलाकार गुच्छे (ग्लोब्यूलर क्लस्टर) एनजीसी-2808 में पराबैंगनी तारों की एक नई श्रेणी की खोज की है।

तारों के गोलाकार गुच्छों (ग्लोब्यूलर क्लस्टर) में हजारों से लाखों तारे होते हैं, इन तारों के गुरुत्वाकर्षण के फलस्वरूप वह गुच्छा अपनी आकृति बनाए रखता है और यह माना जाता है कि इन सब तारों का जन्म लगभग एक ही समय में एक साथ हुआ होगा। हमारी आकाशगंगा मिल्की वे में लगभग 150 गोलाकार गुच्छे हैं। इनमें से कुछ संभवतः आकाशगंगा के सबसे पुराने पिण्ड होंगे।

तारे जन्म लेते हैं, युवावस्था में पहुंचते हैं और फिर उनकी मृत्यु हो जाती है। विकास की इन विभिन्न स्थितियों के आने में जो समय लगता है वह हमारी कल्पना से परे है। भारतीय अंतरिक्ष विज्ञान और प्रौद्योगिकी संस्थान (आइआइएसटी) तिरुवनंतपुरम में एमएससी के पोस्ट ग्रेजुएट छात्र और अनुसंधान दल की सदस्य राशि जैन ने बताया कि बड़े द्रव्यमान वाले तारे तेजी से विकास करते हैं, फिर कुछ लाख वर्षों तक प्रकाशित रहकर एक अत्यंत दर्शनीय मृत्यु को प्राप्त होते हैं। जबकि, हमारे सूर्य या उससे छोटे तारे अरबों वर्षों में धीरे-धीरे विकसित होते हैं। शोध का नेतृत्व करने वाली आइआइएसटी की प्रोफेसर सरिता विग ने कहा कि चूंकि तारों के एक गोलाकार गुच्छे में विभिन्न द्रव्यमान वाले तारे होते हैं, जिनकी रासायनिक संरचना लगभग समान होती है। इसलिए किसी समय हम इनमें एक साथ अपने विकास के विभिन्न चरणों में विभिन्न द्रव्यमानों के तारों की अवस्था देख सकते हैं। आज से 5 अरब वर्ष बाद जब सूर्य लाल रंग का विशाल दानव तारा बन जाएगा तो वह इन्हीं तारों जैसी अवस्थाओं से गुजरेगा। जो तारे सूर्य से अधिक बड़े होते हैं उनका विकास क्रम बहुत भिन्न होता है और वे अंततः पराबैंगनी प्रकाश में उज्ज्वल होते हैं क्योंकि वे अधिक गर्म होते हैं।

शोधकर्ताओं ने इस तरह से किया अध्ययन

शोधकर्ताओं ने बताया एनजीसी-2808 सबसे विशाल गोलाकार समूहों में से एक है और हमसे 47,000 प्रकाश वर्ष की दूरी पर स्थित है। इस समूह का अध्ययन करने के लिए शोधकर्ताओं के दल ने एस्ट्रोसैट में लगी अल्ट्रावायलेट इमेजिंग टेलीस्कोप (यूवीआइटी) का उपयोग किया। एनजीसी-2808 के इस चित्र में दूरस्थ पराबैंगनी उत्सर्जन को नीले और निकटवर्ती पराबैंगनी उत्सर्जन को पीले रंग में दर्शाया गया है। शोधकर्ताओं को विभिन्न पराबैंगनी फिल्टरों के माध्यम से ली गई छवियों में 12,000 से अधिक तारों की अलग-अलग पहचान करने में सफलता मिली है। यूवीआईटी पर पराबैंगनी फिल्टरों का उपयोग करते हुए शोधकर्ताओं ने प्रत्येक फिल्टर में उनकी चमक के आधार पर गर्म तारों के विभिन्न समूहों को अलग करने का प्रयास किया और अपेक्षानुरूप प्रत्येक विकासवादी चरण में तारों की पहचान करने में सफल रहे।

अमेरिकी स्पेस एक्स यान धरती पर लौटा

केप कनावेरल, एपी : अमेरिका का मानवरहित अंतरिक्ष यान स्पेस एक्स कैप्सूल अंतरिक्ष की अपनी पहली टेस्ट फ्लाइट पूरी करके से धरती पर लौट आया है। हालांकि, कैप्सूल पुरातन अंदाज में समुद्र में आ गिरा। शुक्रवार की सुबह यह अंतरिक्ष यान अंतरराष्ट्रीय स्पेस स्टेशन से रवाना हुआ था। उसके छह घंटे के बाद यान में लगा परीक्षण डमी फ्लोरिडा के तट पर एटलांटिक महासागर में उछलकर गिर गया। अमेरिका में पिछले 50 सालों में पहली बार हुआ है कि अंतरिक्ष यात्रियों के लिए डिजाइन किया गया यान अंतरिक्ष से लौटते हुए एटलांटिक में गिरा हो। इससे पूर्व 13 मार्च, 1969 में बहामास के निकट अपोलो-9 आ गिरा था। उल्लेखनीय है कि अमेरिकी अंतरिक्ष एजेंसी नासा कुछ सालों से अपने अंतरिक्ष यात्रियों को रूसी राकेटों पर भेजने को बाध्य है। दरअसल, आठ साल पहले ही नासा का अंतरिक्ष यान रिटायर कर दिया गया है। इसलिए नासा अब स्पेस एक्स और बोइंग पर निर्भर कर रहा है। ताकि इसी साल से अमेरिका अपने ही अंतरिक्ष यानों से अंतरिक्ष यात्रियों को भेज सकें।

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A new roll on to relieve period pain

Researchers from Indian Institute of Technology Delhi (IIT-Delhi) recently launched a roll on that could be used for relieving pain during mensuration

By **BioVoice News Desk** - March 11, 2019

By Jyoti Singh

New Delhi: *Marking the International Women's Day, researchers from Indian Institute of Technology Delhi (IIT-Delhi) recently launched a roll on that could be used for relieving pain during mensuration. Based on essential oils including eucalyptus oil, menthol and wintergreen oil, it can also help improve the mood of users.*

The product has been developed by two third year students at textile technology department, Archit Agarwal and Harry Sehrawat. It took seven months for them to come out with the formulation.

When a woman, who is having periods, suffers from pain, she just needs to apply it on the place where there is pain. She will get immediate relief. It will be effective for up to about eight hours. One 10ml roll on can be used for three period cycles. The rolls have an expiry date of three years from the date of manufacture.

It is different from other pain relief roll ons and ointments as those are formulated to give heating effect first and then cooling effect. This one is formulated in such a way that it gives cooling effect first and then the heating effect. "This is the best way to handle period pain", said Archit Agarwal.

"One of my friends could not write her exam properly and was feeling terrible about it. On questioning she confided that she could not study well because of period pains. From there we got the idea and we thought we should do something about it", he said.

The product, he noted, is 100 % natural and has no side effects. Clinical trials were conducted on two age groups: 14-28 and 28-35. The trials were conducted at the All India Institute of Medical Sciences and the feedback was good.

Dr Rita Bakshi, Chairperson, International Fertility Center, Delhi, who was present at the launch programme, noted that a main plus point of the ointment is that there is nothing to consume and it is made of natural ingredients. "As a doctor I recommend pain killers. But, many women don't take them for fear of side effects. This one is a roll on and is applied externally. I am sure women will use it happily".

Prof. Srinivasan Venkataraman, Mentor, Department of Design, IIT Delhi, said the two students had recently developed a `stand and pee' product whereby women don't have to squat to answer the call of nature. Named Sanfe, the new roll on product for period pain can be purchased from e-commerce sites and medical stores.

The Weather Channel | THE TIMES OF INDIA

Local Communities Key in Conservation of Snow Leopards: Study

By S Suresh Ramanan | ISW | 08 March 2019

Snow leopard caught on camera

(India Science Wire)

Involving local communities and protecting their livelihoods may be a better strategy for conservation of snow leopards, a new study has found.

Snow leopards are apex predators in the alpine ecosystem. Its conservation is critical for saving other species like Asiatic Ibex, Tibetan Argali, Ladakh Urial, Chiru, Takin, Serow and Musk Deer. However, snow leopard numbers are dwindling due to the decline in prey population and poaching for snow leopard skin. There is also 'revenge killing' in areas where leopards kill the livestock of villagers.

For a conservation programme to be successful, it is important to make local communities realize the significance of conserving a species and involve them in the process. This recent research effort approaches snow leopard conservation

accounting for both scientific as well as socio-economic perspectives. Even though the snow leopard is protected under Schedule I of Wildlife Protection Act, 1972 in India, there are no certain details about the potential snow leopard habitats and a long term conservation strategy involving local people. The study done in snow leopard habitats in Ladakh establishes that if people are compensated for the loss of their livestock, 'revenge killing' can be prevented.

First, the researchers used a combination of direct observation as well as 'camera trap'data and a species distribution model called Max Ent to identify potential habitat regions. The model compared the snow leopard presence and absence data collected in the study region with six parameters such as elevation, aspect, ruggedness, distance to water, land cover and prey habitat suitability, to delimit the potential area.

It was found that elevation was the most vital factor, followed by terrain ruggedness and land cover. Hence, the area having an elevation of 2,800 to 4,600 meters and ruggedness 450 to 1,800 meters were identified as a potential habitable site for snow leopards. Overall, it was found that about 12% area in Ladakh region of Jammu and Kashmir is highly suitable for snow leopard.

Finally, the researchers overlaid livestock killing and home stay tourism data from the Snow Leopard Conservancy India Trust and Panthera Foundation with the potential habitable site. There was an overlap of more than 60 % with the predicted habitat area. In these regions, the researchers started working with the local people in facilitating homestay tourism programme. The Snow Leopard Conservancy India Trust supports over 200 homestays in over 40 villages.About 90% of proceeds from the homestays go directly to local families, while the remainder is used for conservation activities like tree plantation, maintenance of cultural sites, garbage management. The income from the homestays helps in offsetting livestock loss to the snow leopards.

"Local people are the most important stakeholders for the conservation of snow leopards or any other wildlife for that matter. Before homestay initiative, many farmers killed snow leopards in retaliation for livestock preyed by leopards. Now revenge killing has come to a halt in the project areas," said says Dr Tsewang Namgail, Director of the Snow Leopard Conservancy - India Trust.

This article was originally published in India Science Wire

Telangana Today

Hyderabad researchers make magnetic graphene for digital devices

It is a carbon material, the thinnest and strongest material known

By AuthorIndia Science Wire | Published: 11th Mar 2019 11:52 pm

Hyderabad: The growing popularity of digital devices has spurred the need for integrated circuits that are light weight, consume ultra-low power and are highly efficient.

Technology companies are increasingly focusing on nano electronics for developing such devices but using nano material such as graphene is still challenging as there is little evidence of it showing intrinsic magnetism.

Now researchers from the Indian Institute of Technology (IIT), Hyderabad and University of Hyderabad have shown that graphene can be made magnetic with the control on electric field and temperature. They have shown this in single layer zigzag graphene nanoribbons.

Graphene, a carbon material, is the thinnest and strongest material known. It came into the limelight after its exceptional quantum properties fetched Andre Geim and Konstantin Novoselov the 2010 Nobel Prize in Physics. From then on, there are many ongoing research projects for its applications in nano electronics.

The team exploited intrinsic magnetism in this light weight soft magnetic material, and also observed occurrence of various magnetic phases and its transitions from one phase to another. It has designed a methodology to identify the position of the appeared magnetic phases, moving towards making ‘graphene chip’ a reality in future.

The research team includes this author and the work was supervised by Dr Amit Acharyya and Dr Swati Ghosh Acharyya. When your laptop or your mobile phone gets too heated up beyond the threshold, you would sometimes get panicky that chips inside the phone would have burnt out. That’s why some phone manufacturers nowadays claim that their phone chipsets are based on 14nm finfet technology and that they have advanced thermal management. Yet, we are facing the heating issues.

Just imagine a situation where the heat generated via the chipset could be harnessed to perform computations. Researchers proceeded with this interesting thought. What if the temperature and electric field can be utilised to induce magnetism in graphene

nanoribbons? There are already reported instances in scientific literature that electric field and temperature can be individually used for controlling or inducing magnetism.

In order to make ‘graphene processors’ a reality, the key issue to be addressed is thermal management. To achieve this, we need a mechanism which could harness excess heat generated in the operation of gadgets to induce magnetism. Our group envisaged a processor application using a single-layer zigzag graphene nanoribbon which could potentially harness heat generated in the system, to reduce the voltage requirement and to perform computations (information propagation) using spins.

The researchers performed computational study on pristine free standing single layer zig-zag graphene nanoribbons typically in the size of 1 to 50 nanometers to study magnetic properties. They could induce intrinsic magnetism in nonmagnetic graphene by application of electric field and temperature.

At a particular value of electric field and temperature, paramagnetism was seen and further tuning to different values led to achievement of ferromagnetism and antiferromagnetism. It was observed that if one value (say electric field) is kept constant, the other value (temperature) can be increased or decreased to obtain different magnetic phases and vice versa. It means if one’s laptop is generating high temperature, lower electric field could achieve the distinct magnetic phases in nano ribbons.

Not limiting themselves to electric field and temperature, the researchers also built a bow-tie scheme to induce magnetism in majority of the carbon allotropes. This thermoelectromagnetic effect and unusual behaviour of magnetism in graphene which is tunable are definitely a stepping stone towards graphene electronics.

The work could pave the way for stretching performance of integrated circuits and eventually lead to realisation of laptops powered by graphene-based microprocessors.

The research team included Santhosh Sivasubramani, Sanghamitra Debroy, Amit Acharyya (IIT Hyderabad); Swati Ghosh Acharyya (University of Hyderabad). The study results were published in journal Nanotechnology.

The research work is partially funded by Redpine Signals, Department of Science and Technology (DST), Centre for Development of Advanced Computing (CDAC) and Ministry of Electronics and Information Technology. –

India Science Wire

Bane to Boon: Scientists Transform Black Soot into Water Purification Method!

Treatment of waste water with organic dyes has remained a major challenge. The available methods are generally costly and cumbersome. According to the scientists involved in the development of the new process, it would offer a cost-effective and sustainable solution.

by **India Science Wire**March 13, 2019, 10:19 am

Hitting two birds with one stone, a group of Indian scientists have come up with a new process which promises to help utilize black carbon soot, which is a major air pollutant, for treating industrial waste containing highly poisonous organic dyes.

The scientists have developed two techniques: one to convert black soot into graphene nanosheets, and the second to utilise the nanosheets to remove organic dyes such as crystal violet, rhodamine B, and methylene blue from industrial waste.

Black carbon soot is emitted from gas and diesel engines, coal-fired power plants and other processes that involve burning of fossil fuel. it is known to be highly carcinogenic. Organic dyes, in turn, are an important component of industrial waste and are generally non-biodegradable and deadly. They enter water bodies and make them not only unfit for human consumption but also highly poisonous.

Treatment of waste water with organic dyes has remained a major challenge. The currently available methods are generally costly and cumbersome.

According to the scientists involved in the development of the new process, it would offer a cost-effective and sustainable solution.

Speaking to **India Science Wire**, Kumud Malika Tripathi, one of the co-authors of the study, said "the technique we have developed for synthesizing Graphene nanosheets from black-soot is very easy, quick and economical.

Black soot is available everywhere and even a layperson can convert it into Graphene nanosheets at home.

The second process of utilizing the nanosheets for treating the waste water is also not very complicated. One just had to put the nanosheets into industrial waste water, in the presence of sunlight. The dyes in the water are broken down into simpler and harmless elements and are subsequently isolated."

The scientists tested the sustainability and the suitability of the overall process by using the treated water for growing wheat. “Seeds which had been germinated for 24 hours were used. Their growth was normal and healthy as compared to those grown with untreated water.”

The research team comprised of Gunture, Anupriya Singh, Anshu Bhati, Prateek Khare and Sumit Kumar Sonkar, from Department of Chemistry at Malaviya National Institute of Technology, Jaipur, besides Kumud Malika Tripathy, who is from Department of Bio-nanotechnology at Gachen University, South Korea. They have published a report on their work has been published in the journal Scientific Reports.

Article Courtesy: India Science Wire

Newsroom 24x7

Scientists solve genetic puzzle surrounding Mundas

BY NEWSROOM24X7 NETWORK ON MARCH 12, 2019

Dinesh C Sharma

New Delhi: Genetic studies, in recent years, have traced the origins of majority of population groups in the Indian sub-continent to two ancestral populations– Ancestral North Indian and Ancestral South Indian. At the same time, it is seen that sizeable population group of Mundas in central and northeast India shares genetic ancestry with Southeast Asian populations as well.

A new study now has revealed how and when this admixture between Mundas and Southeast Asian populations took place.

The study has found that genetic makeup of Mundas is a result of interaction that happened two to four thousand years ago between Indian Dravidian and Southeast Asian populations. It has also become clear that among Southeast Asian populations, Mundas are genetically closer to tribes of Malaysian peninsula like Mah Meri and Temuan, rather than Austroasiatic groups in geographically closer countries like Vietnam or Cambodia.

Mundas belong to a tribal group which is spread over states in central India. Earlier archaeological, linguistic and genetic studies have shown that they belong to Austroasiatic speakers who are spread over Southeast Asia. Mundas have both the South Asian and Southeast Asian genetic signatures.

The analysis of DNA samples of Mundas and other population groups in South and Southeast Asia has shown that people from Laos are the best representative of the Southeast Asian admixture in the Munda population. The Lao population is responsible for one third genetic contribution to Munda people in India while the remaining two thirds genetic component comes from early Dravidians of Kerala – Paniya or Pulliyar.

Researchers analysed 102 individual samples from Munda speaking populations in context of 978 other samples from 72 populations mainly from India, Southeast Asia and East Asia. The international team of researchers was led by Kai Tatte of the Estonian Biocentre-Institute of Genomics of University of Tartu, Estonia. The results of the study have been published in journal Scientific Reports.

“The best modern proxies for the source populations of Munda that went through

admixture are Lao people from Laos and Dravidian speakers from Keralite Dravidians (Paniya or Pulliyar). It is also clear that initial Dravidians with whom the incoming Southeast Asians admixed had a smaller West Eurasian genetic component than the present day Pulliyar or Paniya groups," explained said Ajai K Pathak, a member of the research team at University of Tartu, Estonia, while speaking to India Science Wire.

The study also included Dr Gyaneshwer Chaubey, an expert on South Asian population genetics at the Banaras Hindu University (BHU). "To me, the most fascinating finding is the timeline of Munads arrival in India. Our previous study had showed that the Mundas arrived from Southeast Asia and the migration was male-mediated, but it did not pinpoint their location and time of arrival. Now we were able to pinpoint their cradle to Laos and time of arrival to last 3-4 thousand years," Dr Chaubey told India Science Wire.

The research team included scientists from Estonia, India, Italy, Australia, Vietnam, Bangladesh, Israel and Belgium. (India Science Wire)

Twitter handle: @dineshcsharma

सात करोड़ साल पहले पूर्वजों से अलग हो गए थे यह मेंढक

मेंढक की यह प्रजाति वायनाड के कुचियारमाला चोटी के नाम से जानी जाती रही है जो वायनाड के घने जंगलों में पत्तियों के ढेर के नीचे रहती है।

नई दिल्ली, आइएसडब्ल्यू। भारतीय शोधकर्ताओं ने पश्चिमी घाट में मेंढक की एक नई प्रजाति का पता लगाया है। पीढ़ी दर पीढ़ी अनुवांशिक लक्षणों में होने वाले बदलावों और जैविक विकास के क्रम में मेंढक की यह प्रजाति करीब छह से सात करोड़ वर्ष पहले अपने पूर्वजों से अलग हो गई थी। मेंढक की इस प्रजाति को ऐस्ट्रोबैट्राकस कुरिचिआना नाम दिया गया है और इसे नए एस्ट्रोबैट्राकिने उप-परिवार के तहत रखा गया है। इस मेंढक के शरीर के दोनों किनारों पर मौजूद चमकदार धब्बे पाए जाते हैं, जिसे रेखांकित करने के लिए इस नई प्रजाति के नाम में एस्ट्रोबैट्राकस जोड़ा गया है। केरल के वायनाड में, जहां इस प्रजाति के नमूने पाए गए हैं, वहां के स्थानीय कुरिचिआ आदिवासियों के सम्मान में इसके नाम में कुरिचिआना शामिल किया गया है। मेंढक की यह प्रजाति वायनाड के कुचियारमाला चोटी के नाम से जानी जाती रही है, जो वायनाड के घने जंगलों में पत्तियों के ढेर के नीचे रहती है।

यह अध्ययन भारतीय विज्ञान संस्थान, बेंगलुरु, जूलॉजिकल सर्वे ऑफ इंडिया, पुणे, फ्लोरिडा नेचुरल हिस्ट्री म्यूजियम एवं जॉर्ज वॉशिंगटन विश्वविद्यालय, अमेरिका के शोधकर्ताओं द्वारा संयुक्त रूप से किया गया है। पश्चिमी घाट में रेंगने वाले और उभयचर जीवों की विविधता को उजागर करने के लिए किए गए एक सर्वेक्षण में मेंढक की इस प्रजाति के नमूने पाए गए हैं।

बेंगलुरु स्थित भारतीय विज्ञान संस्थान के सहायक प्रोफेसर कार्तिक शंकर और उनके शोधार्थी एसपी विजयकुमार द्वारा किए गए इस सर्वेक्षण में पश्चिम घाट के विभिन्न ऊंचाई वाले स्थानों, अलग-अलग वर्षा क्षेत्रों, विविध प्रकार के आवास में रहने वाले सरीसृप और उभयचर जीव शामिल थे। अध्ययनकर्ताओं में शामिल विजय कुमार ने बताया कि पश्चिमी घाट में पाए जाने वाले निक्टीबैट्राकिने और श्रीलंका के लैंकैनेक्टिने मेंढक इस नई प्रजाति के करीबी संबंधियों में शामिल हैं। निक्टीबैट्राकिने प्रजाति का संबंध निक्टीबैट्राकस वंश से है, जबकि लैंकैनेस्टिने मेंढक लैंकैनेक्टेस वंश से संबंधित है।

शोधकर्ताओं ने फ्लोरिडा म्यूजियम ऑफ नेचुरल हिस्ट्री की ओपनवेर्टब्रेट परियोजना (ओवर्ट) के अंतर्गत उपलब्ध नमूनों का उपयोग करते हुए अन्य प्रजातियों के मेंढकों के कंकाल से नई प्रजाति की तुलना की है। मेंढक के रूप एवं आकार संबंधी तुलनात्मक विवरण जूलॉजिकल सर्वे ऑफ इंडिया की मदद से प्राप्त किए गए हैं। इसके अलावा, जॉर्ज वॉशिंगटन विश्वविद्यालय के मेंढकों के आनुवंशिक विश्लेषण के आंकड़ों के उपयोग् से नए मेंढक के संबंधियों की पहचान हुई।

दक्षिण अमेरिकी और अफ्रीका के मेंढकों की जैसी है संरचना

शोधकर्ताओं ने बताया कि नए वंश और नए उप-परिवार से संबंधित अज्ञात प्रजातियों की खोज दुर्लभ है। आणविक विश्लेषण से पता चला है कि इस नई प्रजाति के पूर्वज जैविक विकास के क्रम में लगभग 6-7 करोड़ साल पूर्व अलग हो गए थे। ऐस्ट्रोबैट्राकस मेंढक प्रायद्वीपीय भारत में पाया गया है, लेकिन इसके रूप एवं आकृति (विशेषकर त्रिकोणीय अंगुली और पैर की अंगुली की युक्तियां) दक्षिण अमेरिकी और अफ्रीका के मेंढकों जैसी दिखती है। प्रोफेसर कार्तिक शंकर ने बताया कि पश्चिमी घाट में मेंढक वंश के सबसे पुराने जीवित सदस्यों से जुड़ी यह एक दुर्लभ खोज है। प्रोफेसर शंकर और विजय कुमार के साथ शोधकर्ताओं में जूलॉजिकल सर्वे ऑफ इंडिया, पुणे के वैज्ञानिक केपी दिनेश, जॉर्ज वॉशिंगटन विश्वविद्यालय में जीव विज्ञान के एसोसिएट

THE HINDU BusinessLine

Climate vulnerability maps developed for Himalayan states

Dinesh C Sharma New Delhi | Published on March 14, 2019

Receding apple lines, changing cropping patterns, more disasters like landslides and floods, drying springs in hills, spread of vector-borne diseases and so on. Such impacts related to climate variability and climate change are being felt all over the Himalayan region, which is one of the most sensitive climate zones globally. But the vulnerability to climate change varies from state to state and even district to district within a state. Vulnerability also depends on various socio-economic factors and not just weather-related.

Taking this situation into account, Indian scientists have developed a common framework for assessment of climate change vulnerability in all the states in the Himalayan region - Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, Arunachal Pradesh, Sikkim, Himachal Pradesh, Uttarakhand, Jammu and Kashmir and hilly districts of West Bengal. They have developed an index based on socio-economic factors, demographic and health

status, sensitivity of agricultural production, forest-dependent livelihoods and access to information, services and infrastructure.

The assessment, formally launched today, shows that the vulnerability index is the highest for Assam (0.72) and Mizoram (0.71), followed by Jammu & Kashmir (0.62), Manipur (0.59), Meghalaya and West Bengal (both 0.58), Nagaland (0.57), Himachal Pradesh and Tripura (0.51 both), Arunachal Pradesh (0.47) and Uttarakhand (0.45). Sikkim is the least vulnerable state with the index being 0.42. Districts within a state face different degrees of vulnerability based on difference in geographic, climatic, socioeconomic and demographic conditions.

“All these states are vulnerable to climate risks and the fact that vulnerability is a relative measure implies that this assessment does not portray Sikkim, Uttarakhand or Arunachal Pradesh as having a low vulnerability in an absolute sense. These states are least vulnerable relative to the other states, but also have several inherent drivers of vulnerability that need to be addressed,” pointed out Anamika Barua (IIT Guwahati), one of the principal scientists involved in the exercise.

Assam is highly vulnerable to climate change because of factors like low per capita income, deforestation, large number of marginal farmers, least area under irrigation, lack of alternative sources of income and high rates of poverty. “All of these make people vulnerable to climate change as they have less capacity to adapt,” explained Barua while speaking to India Science Wire.

DST secretary Ashutosh Sharma said “climate adaptation is a collaborative effort between appropriate use of technology, vision that produces policies, change at ground level and engagement of local communities. These vulnerability maps will play a crucial role in this effort.”

“The vulnerability assessments will be useful for officials, decision makers, funding agencies and experts to have a common understanding on vulnerability and enable them to plan for adaptation,” pointed our Akhiklesh Gupta, head of the climate change programme in DST.

NH Ravindranath from Indian Institute of Science, Bengalore said, “the framework can be applied to states in the rest of the country as well, with suitable modifications.” Timothy A. Gonsalves, Director, IIT Mandi, said, “various research projects undertaken by IIT Mandi address vulnerability, hazard and extreme events in the Himalayan region.”

The assessment has been done jointly by experts from Indian Institutes of Technology at Guwahati and Mandi, in collaboration with Indian Institute of Science, Bangalore with support from the Department of Science and Technology (DST) and the Swiss Development Corporation (SDC) which is implementing the Indian Himalayas Climate Adaptation Program (IHCAP).

A new data portal - http://himalayageoportal.in/ - was also launched on the occasion.

Twitter handle: @dineshcsharma

(India Science Wire)

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DownToEarth

IIT Kharagpur gets new high power computing facility

The research activities will include building hardware and software for high performance computing systems, data management, analytics and visualisations

By Sunderarajan Padmanabhan Last Updated: Thursday 14 March 2019

Indian Institute of Technology (IIT), Kharagpur, is all set to ramp up its research and development activities with the acquisition of a 1.3 petaflop high power computing facility and a data centre under the National Supercomputing Mission (NSM).

The institute signed a memorandum of understanding with the Centre for Development of Advanced Computing (C-DAC) this week to facilitate supply, installation, commissioning and operations of the system.

“We have selected specific challenge domains like cryptography, chemistry, molecular dynamics, drug discovery, artificial intelligence and data sciences where the new system would be utilized. We have also identified challenges in these domains and applications in areas such as healthcare, smart cities, geosciences, new materials and other discovery based sciences,” said Professor PP Chakrabarti, director, IIT-Kharagpur.

The research activities will include building hardware and software for high performance computing systems, data management, analytics, and visualisations. In addition, the system will be used for research in computational biology, drug design, atmospheric modeling, computational fluid dynamics, modeling of novel materials, computational chemistry and physics, numerical mathematics, computational mechanics and non-equilibrium molecular dynamics.

The institute will also offer academic programmes and training in high power computing. The Institute will conduct degree programs, doctoral programs and micro-specializations for undergraduate students and short-term courses for industry professionals. “The new facility is likely to be ready for use in three to four months. All the products and accessories will be designed and manufactured within the country,” said Hemant Darbari, director general, C-DAC.

The National Supercomputing Missionis being implemented jointly by the Department of Science and Technology (DST) and Department of Electronics and Information Technology (DeitY) at an estimated cost of Rs 4,500 crore. It envisages installing vast supercomputing grid comprising of over 70 high-performance computing facilities spread across the county.

(India Science Wire)

Voice of the Nation
ORGANISER

Palm fossils suggest Tibet had high mountains and deep valleys

15-Mar-2019

By Dinesh C Sharma Twitter handle: @dineshcsharma

New Delhi, March 15 (India Science Wire): Tibetan plateau is believed to have been formed due to the collision of the Indian and Eurasian plates 50 million years ago. But a new study has now suggested that Tibet may not have been a plateau all the time and perhaps had high mountains and deep valleys – topography and climate good enough for subtropical plants to grow.

Palm fossil (Photo : Tao Su)

The conclusion is based on discovery of fossils of palm leaves estimated to be 25 million years old. The palm fossils were found from the sediments of the Lunpola basin by Professor Tao Su of the Xishuangbanna Tropical Botanical Garden at the Chinese Academy of Sciences in 2016. The fossils have prominent spine-like structures at the base of the leaf blades, differentiating them from palm fossils found before.

By studying the fossil and combining the knowledge with new climate models that can simulate ancient temperatures, researchers have estimated the past elevation of Tibetan plateau. They now believe that the plateau could have been about 2.3 kilometer high and must have had large lakes surrounded with subtropical vegetation and deep valleys. Till now, it was believed Tibet's elevation must have been 4 kilometer, almost as high as today.

Prof. Robert A. Spicer, Dr. Tao Su and Dr Gaurav Srivasatava (Left to right)

"Palms have a unique character - they can't survive in very cold climatic condition and that's why they are mainly restricted in frost-free areas of the world. Palms require a minimum of 5 degree temperature in coldest part of the year for their survival. This means that during deposition of the sediments in Lunpola, temperature of cold months was not less than 5 degrees. If this is the case, then Tibet had valley system of topography surrounded by the mountains during the deposition of the sediments," explained Dr Gaurav Srivastava, a member of the research team and a scientist at the Lucknow-based Birbal Sahni Institute of Palaeosciences.

This finding is in agreement with the isotopic data which suggests that high mountains were present and also with palaeontological data which suggests that a low elevation of the Tibetan plateau, Srivastava said while speaking to India Science Wire.

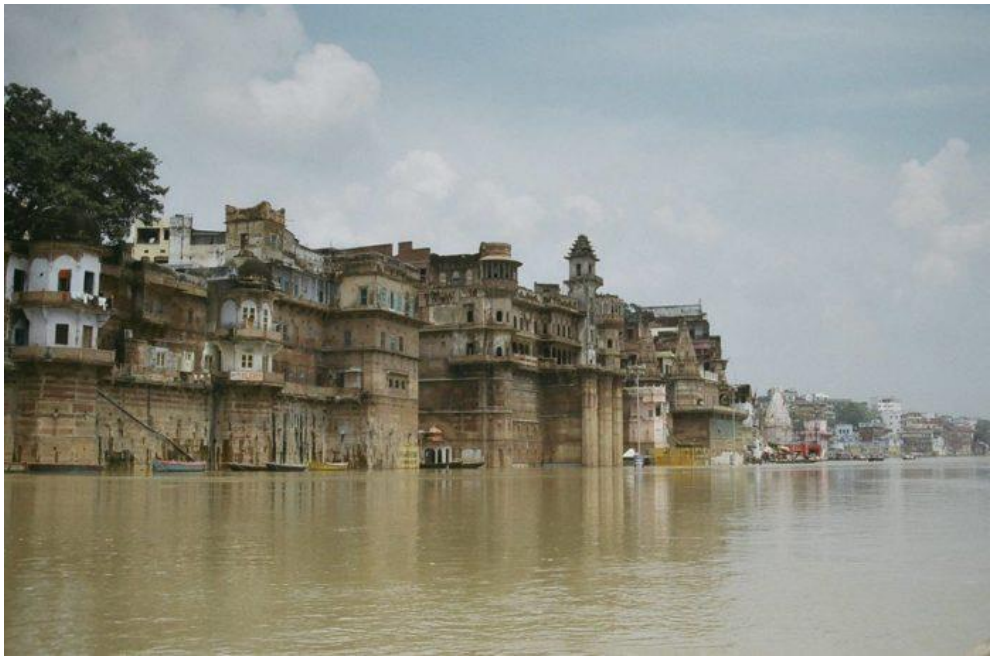
"It now seems that as recently as 25 million years ago, the Tibetan landscape consisted of high mountains and deep valleys," said Prof Su. Moreover, researchers said, "the Tibetan landscape must have only become a plateau much more recently after compression from India and sediment infilling raised the valley floor by at least 2.5 km to its present height of 4655 meters."

"The finding of these extraordinary fossils, combined with a multidisciplinary research approach, is transforming our knowledge of the ancient Tibetan landscape and how Tibet was built - it is no longer just about the India-Asia collision, added Professor Robert Spicer from the Open University, another member of the research team.
The international team included palaeobotanists from Xishuangbanna Tropical Botanical Garden and climate modellers from the University of Bristol, UK. The study results have been published in journal Science Advances.

(India Science Wire)

High Traces of Antibiotic-Resistant Bacteria Found In Ganga

March 20, 2019



High Traces of Antibiotic-Resistant Bacteria Found In Ganga

Antibiotic resistance is a global threat elevating at an alarming rate. It has been a hot topic of research for the Scientists community. As per a new study, huge traces of bacteria resistant to loads of commonly used antibiotics have been located in river Ganga.

It is being speculated that residues of antibiotics through waste discharged from households, drug manufacturing units, hospitals and

poultry industry where antibiotics are used is reaching the water body, in huge amount.

These antibiotics in water lead to the growth of antibiotic-resistant bacteria which have evolved in number and have spread through the environment. This emerging alarming situation can be lethal to human health, as an infection with this kind of resistant bacteria could become untreatable.

BHU Research team. Image Courtesy – India Science Wire

Banaras Hindu University (BHU) researchers in their study found the presence of antibiotic as well as metal resistant bacteria in river Ganga. The DNA was extracted by the Researchers from these samples and exposed to a high throughput technique to sequence DNA of bacteria within the samples.

A comparison of the information with existing sequences of metal and antibiotic resistance genes revealed that bacteria resistant to antibiotics like beta-lactam, multidrug/efflux, and elfamycin are highly abundant in the Ganga river water. At the exact same time, bacteria resilient to a selection of commonly used antibiotics were also present in water samples.

In the case of metals, bacteria had genes resistant to ions of silver, iron, aluminum, chromium, arsenic, and zinc. “This study suggests that metals and antibiotics will be the driving force for the development of resistance genes, and their subsequent propagation and accumulation in the environmental germs,” researchers have pointed out.

Dr. Suresh Kumar Dubey professor in Molecular Ecology Laboratory, Center of Advanced Study in Botany at BHU explained that Varanasi region receives over 309.8 million gallons of treated and untreated domestic waste daily by various point and non-point sources, which might be leading to accumulation of resistant gene in the environment.

The results of the study, he said, will be useful to regulatory agencies such as state and central pollution control boards in creating policy change to enforce pollution control regulation to prevent additional input of antibiotics and toxic metals from the river via domestic, hospital and industrial wastewater.

Dr. Bhaskar Reddy and Dr. S. K Dubey with assistance from the Department of Science and Technology (DST) and the Science and Engineering Board (SERB) performed the analysis. The study results have been published in the journal Environmental Pollution.

THE HINDU BusinessLine

Fishing, coral reef degradation threaten parrotfish in Andaman: study

Sanghamitra Deobhanj Cuttack | Published on March 18, 2019

Bumphead parrotfish of Nicobar islands

Protection of coral cover along the existing protected marine areas in the Andaman and Nicobar islands is necessary for conservation of the endangered bumphead parrotfish, a new study has suggested.

Bumphead parrotfish, Bolbometopon muricatum, is an important component of coral reef ecosystem, but is highly endangered globally. It is categorized as ‘vulnerable’ in the Red List of the International Union for Conservation of Nature (IUCN). This fish is highly prized resource, but is threatened due to limited knowledge about its distribution and abundance in Indian waters.

Now a group of researchers have studied the distribution, abundance and dangers to this species in the waters of Andaman and Nicobar islands. “A large body size, aggregating behaviour and limited activity at night make B. muricatum an easy target for spear-fishers. Combined with slow growth and low replacement rates, this has resulted in population declines across the Indo-Pacific and Red Sea regions,” said Vardhan Patankar, a marine biologist from Wildlife Conservation Society- India.

The team carried out underwater visual census, during November 2013 and April 2015, at a total of 75 reef sites across 51 islands of Andaman and Nicobar islands, using scuba diving and underwater camera. It recorded 59 individuals of parrotfish across nine sites from the northernmost island in the Andamans (Landfall Island) to the southernmost island in the Nicobars (Great Nicobar Island).

Under water survey being conducted for parrotfish

During the study, the scientists also spoke to about 100 fishermen regarding their awareness and perception of B. muricatum. From the interviews, they collected the data on the intensity of fishing, ethnic heterogeneity of the fishing community and the diversity of fishing gear used.

The team found that the fish occurs unevenly, with most sightings from only two islands, and with an apparently very small density. It also emerged free diving spear-fishers exclusively target the aggregations of this fish during night.

The study reports that the presence of a protected area, live coral and algal cover, significantly influenced the distribution and abundance of B. muricatum. Incidental catch by fishers and degradation of coral reef habitats are two potential threats to the species.

“Evidence of low abundance of B. muricatum on ocean reefs surrounded by deep waters, and traits such as limited dispersal and gregariousness, could also have influenced the distribution and abundance of this fish,” said Tanmay Wagh, another member of the team.

The findings suggest the necessity to ban night fishing for the species and to implement regulations regarding reef fishing. Considering the vulnerable status of B. muricatum globally, the species could be a flagship for educational campaigns focusing on the importance of conserving similar fish groups and protecting the coral reefs.

Team of researchers

The research team included Vardhan Patankar (Wildlife Conservation Society-India and National Centre for Biological Sciences); Tanmay Wagh (Dakshin Foundation); and Aniruddha Marathe (Ashoka Trust for Research in Ecology and the Environment). The research findings have been published in the journal Oryx.

(India Science Wire)

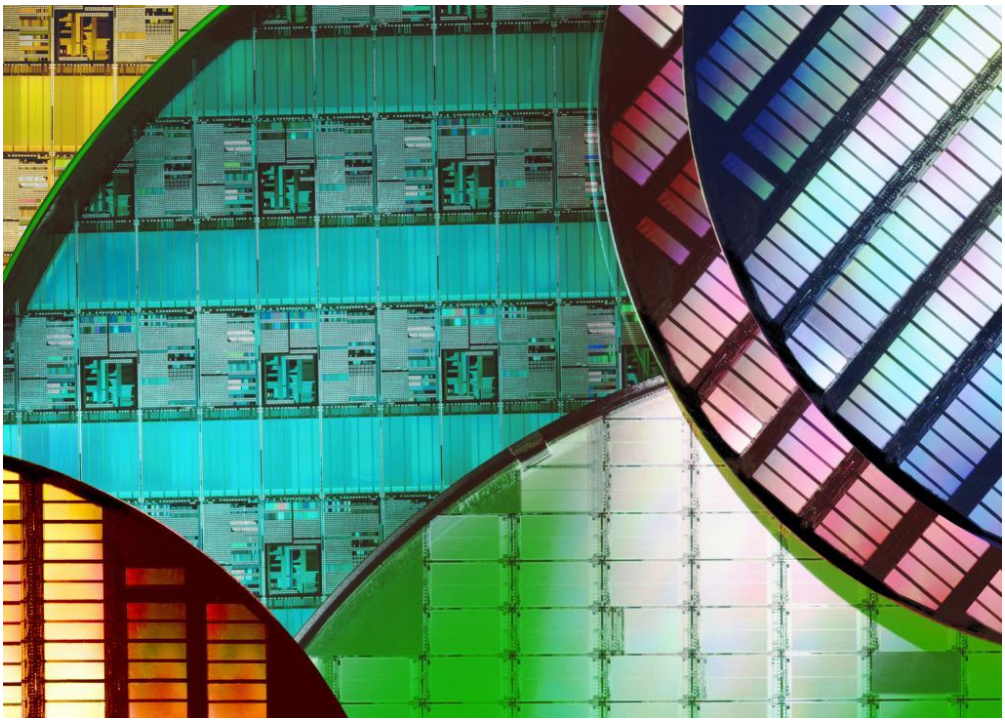
Published on March 18, 2019

DownToEarth

New discovery paves way for ‘silicon of the future’

Researchers placed 2 ultra-thin materials on top of each other to get a new material with hybrid properties

By Dinesh C Sharma Last Updated: Wednesday 20 March 2019



Just imagine taking two extremely ultra-thin materials with different properties and placing one on top of the other, and obtaining a new a material with hybrid properties.

This is what an international group of researchers have done with two atomic-level semiconductor materials and have got a new material whose properties are not only hybrid but also tunable. The materials are nothing but crystalline sheets of atoms — measuring one-millionth of a human hair in thickness. Scientists call such atomic materials two-dimensional (2D).

The two atomic layers are held together not by any physical or chemical reaction but due to a force known as 'van der Waals interaction'. The materials used in the study are monolayers of molybdenum diselenide and tungsten disulfide.

Since the two layers used in experiments are semiconducting, the new material too has semiconducting properties like that of silicon-based materials used in miniature electronics. The new material could be the silicon of future because it is semiconducting as well as transparent, light weight, flexible and stretchable. Silicon-based materials are three dimensional (3D).

The discovery has been announced in journal *Nature* by in a paper by scientists from the UK, Korea, India, Poland, Japan and Mexico. Among authors of the research paper is Kostya S Novoselov, who won the Nobel Prize for physics in 2010 for his work on graphene. He is professor at the University of Manchester.

"When two atomically thin semiconducting transition metal dichalcogenides are combined in a single structure their properties hybridize. The materials influence each other and change each other's properties. They could be considered a whole new 'meta'-material with unique properties," Pramoda Kumar Nayak, DST Ramanujan Fellow at Department of Physics, IIT Madras and a member of the research team, told *India Science Wire*.

It has also been observed that properties of the new hybrid material cold be controlled by twisting the two stacked atomic layers. "This opens the way for design of new materials

and electronic devices for future technologies with a range of applications in photo detectors, biosensors, supercapacitors, solar cells and wearable devices," he added.

The idea of stacking layers of different materials to make heterostructures is pretty old and is behind most semiconductor devices. Now similar heterostructures are being developed using atomic layers. This could give rise to a new class of devices, according to Nayak. Along with other colleagues at IIT Madras, Nayak is engaged in developing such 2D materials and their heterostructures for use in high efficient optoelectronic and nanoelectronic devices.

"This is a groundbreaking work, opening up an entirely new set of possibilities in material science. It is extremely interesting that not only can one hybridize properties of two different nanosheets by elegantly placing them over each other, one can also tune the degree of hybridisation simply by twisting how one nanosheet layer is arranged over the other," said Kabeer Jasuja, a nanotechnologist at IIT Gandhinagar, who is not connected with this study.

The study, Jasuja said, "is a significant step towards development of novel heterostructures wherein different 2D materials are assembled together to obtain metamaterials, which bring to reality properties not found in naturally occurring materials. This is an exciting phase in the science of 2D materials beyond graphene."

(India Science Wire)

Celestial Mystery: Records of Historical Supernova Found in Karnataka

"What is that in Vyomaganga? It is not the moon because it is quite bright; not the sun because it is night; it is the internal fire in the water/ocean," reads a verse from an ancient text.

by **India Science Wire** March 23, 2019, 1:13 pm

Imagine walking at dusk under a blue sky that is gradually turning black. Twinkling stars are beginning to appear here and there. And suddenly you discover new star dazzling that was not there the previous night. Could it be Venus or perhaps a comet?

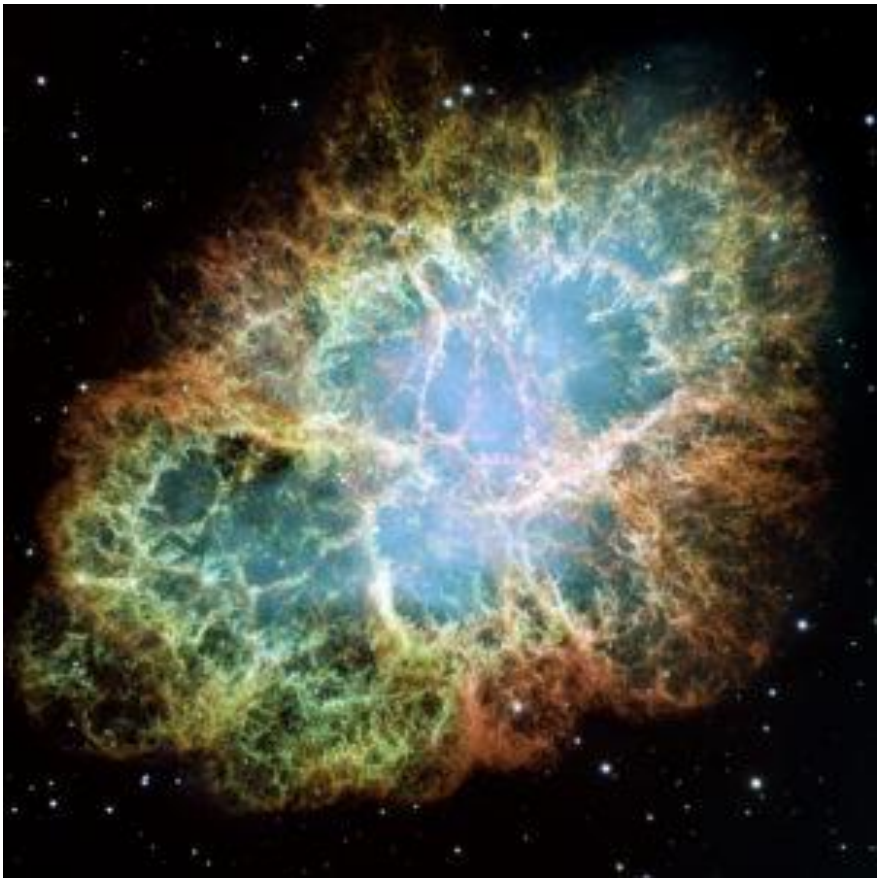
That is what Tycho Brahe, Danish astronomer and writer, thought when he saw a new star in the sky on 11 November, 1572. He coined the term 'nova' meaning a new star. Another nova appeared 12 years later. This time it was seen by Lodovico delle Colombe, an Italian scholar. The new star had appeared amidst the celestial river `Milky Way' in the constellation of Ophiuchus.

The two novae remained visible to the naked eye for more than a year and opened up a debate questioning the Aristotelian concept of stars that they are eternal with no death or birth. Many astronomers recorded the position of these novae which are now technically christened as supernovae.

Close up view of the rete and comparison with star chart. The circles correspond to Altair (Travana), Vega (Abhijit), Ras Alhague (Dhanishta) and Arcturus (Swathi).

The Orange circle corresponds to the position of supernova and the blue arrow on the rete

Such events are indeed very rare. An earlier event happened in July 1054 and was chronicled by Chinese observers as a ‘guest star’. Astrophysicists have linked the event to the famous Crab Nebula, thanks to Chinese astronomers who recorded the date and the position of the `guest star’. The expanding nebula was noted nearly 700 years later, in 1731, and got the first entry into the famous list of Messier.



Crab Nebula. Photo Source: Wikipedia

It has always been a big puzzle for historians as to why these events have not been recorded in India even though it has had distinguished accomplishments in astronomy and mathematics. Many texts and documents in these areas date back to 5th – 6th century CE.

Astrophysicist Prof Jayant V. Narlikar and Sanskrit and Prakrit scholar Prof Saroja Bhate had studied these texts but could not find any references to the sighting of novae.

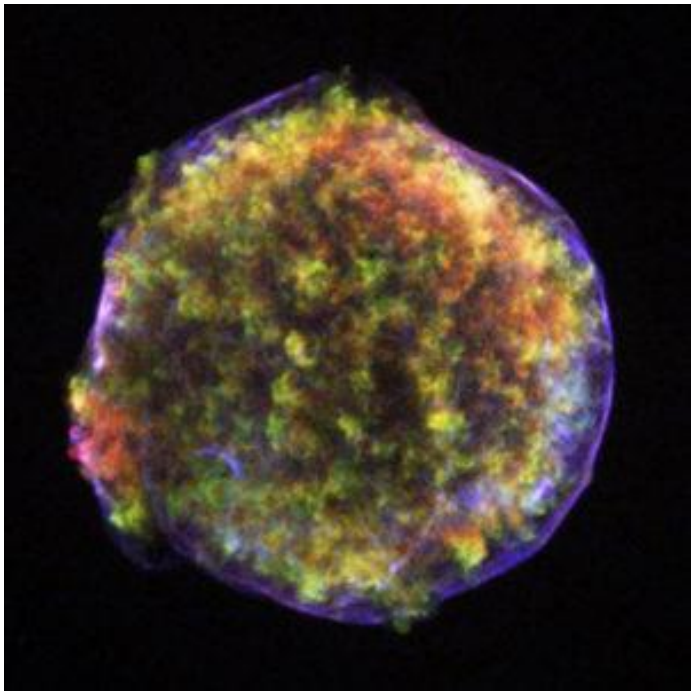
In recent years, however, some evidence has emerged in the form of stone inscriptions. A tradition of penning edicts on stones is widespread all over South and South East Asia. The language used in these inscriptions, which date back to the first millennium, was Sanskrit, rendering it easy to decode the meanings. The inscriptions are rich in astronomical details such as eclipses and planetary conjunctions.

There is a stone inscription, which talks about the installation of a Baahubali statue in the Venuru town in Karnataka, which was once a seat of Jainism and

capital of the Ajila Dynasty. The inscription is written in Kannada script, through the language is Sanskrit. The information regarding the date is complete with year, month and day. The inscription refers to the supernova of 1604.

The inscription describes sage Charukeerthi Bhattacharya, who was instrumental in the installation of the statue as “like a nishapathi in the Ksheerambudhi”. The word nishapathi is generally used for moon. However it has another meaning: camphor. Ksheerambudhi is interpreted as implying Belagola (which means ‘white lake’ in Kannada) town in Karnataka while it can also mean Akashaganga or the Milky Way. It probably signifies something burning like camphor in the Milky Way. The 1604 supernova was indeed in constellation Sagittarius, which is part of the Milky Way.

There is yet another record of the 1604 supernova in astrolabes, which are small handy metallic gadgets that served as portable calculators for navigation. Its specially designed rotatable star dial called rete has small pointers corresponding to bright stars. These instruments were introduced in India around 13th century by Arabs. The construction of the rete needed an astronomer well versed with the sky.



Historian Prof. S R Sarma has studied astrolabes available in museums all over the world and has prepared an exhaustive catalogue. One particular astrolabe is dated 25th December 1605. It has a star by name Dhanusharagra to the South

of another star called Dhanukoti. While Dhanukoti is found in almost all astrolabes (and is identified with a bright star called α Oph, Arabic name Rasalhague), Dhanusharagra is exclusive to this astrolabe and its position matches with that of the 1604 supernova. Thus we find that 1604 supernova has found its place in two records.

A record of the 1572 supernova, which occurred in the northern branch of the Milky Way in the constellation of Cassiopeia, has also been found in a book of Sanskrit grammar of the 16th Century. Appaya Dikshita (1520-1593) was well-known expositor and practitioner of Advaita vedanta school of philosophy and his books on alankaras (simile and metaphor) are used as text books.

His work 'Kuvalyananda' has an example for what is termed as Apahnuti, which means using a denial character for describing a thing/event. There are two verses. The first verse is: "what is that in Vyomaganga? It is a lotus. Not the moon." This is followed by: "It is not the moon because it is quite bright; not the sun because it is night; it is the internal fire in the water/ocean".
In both verses the word Vyomaganga refers to the Heavenly River Akashganga. The description matches with the sighting of supernova. Thus, we notice that supernova attracted the interest of non-astronomers too.

It may be worth searching such records in the literary works of other Indian languages. From all this, it is clear that criticism of western scholars that great celestial events of supernovae had gone unnoticed in India in totally unfounded.

The author, Dr BS Shylaja, is the former director of the Jawaharlal Nehru Planetarium, Bengaluru.

(Article Courtesy: India Science Wire)

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कर्नाटक में मिले ऐतिहासिक सुपरनोवा के अभिलेख

खुलेंगे राज

वेनुरु नामक कस्बे में मिले अजिला साम्राज्य के समय के शिलालेख में बाहुबली की विशाल प्रतिमा की स्थापना के बारे में लिखा है, इसमें वर्ष 1604 के सुपरनोवा का भी है जिक्र

बेंगलुरु, आइएसडब्ल्यू : यदि काली अंधेरी रात में टिमटिमाते तारों से भरे आकाश के बीच आपको कोई नया चमकदार पिंड दिखाई दे जो कल उस स्थान पर नहीं था तो आप शायद सोचेंगे कि वह या तो शुक्र ग्रह है या कोई नया धूमकेतु। आज से बहुत पहले सोलहवीं सदी में डेनमार्क के खगोलशास्त्री और लेखक टिको ब्रा के साथ भी 11 नवंबर, 1572 को कुछ ऐसा ही हुआ था और उन्होंने एक नया शब्द 'नोवा' गढ़ा, जिसका अर्थ था 'एक नया तारा'। इसके 12 वर्ष पश्चात फिर एक नोवा दिखाई दिया। इसे एक इतालवी विद्वान लॉडोविको डेल कोलोंब द्वारा देखा गया था। यह आकाशगंगा में भुजंगधारी तारामंडल में स्थित था।

दोनों नोवा एक वर्ष से भी अधिक समय के लिए आकाश में चमकते रहे। इससे अरस्तु के समय से चली आ रही उस पुरानी अवधारणा पर प्रश्नचिह्न लग गया, जिसके अनुसार तारे शाश्वत होते हैं। बहुत से तत्कालीन खगोलशास्त्रियों ने उस समय इन नोवा पिंडों का अध्ययन किया। आधुनिक खगोलशास्त्र में इन्हें अब सुपरनोवा कहा जाता है। हमें भारत में खगोलशास्त्र के अध्ययन के उल्लेख पांचवीं या छठी ईसा पश्चात सदी के समय से मिलते हैं, जब प्रसिद्ध खगोलशास्त्री प्रोफेसर जयंत नार्लीकर और

कर्नाटक के वेनुरु कस्बे से मिला शिलालेख।

संस्कृत और प्राकृत के ज्ञाता प्रोफेसर सरोजा भाटे ने उस समय से लेकर बाद के इन पुराने विवरणों का अध्ययन किया तो उन्हें भारतीयों द्वारा नोवा देखने का कोई उल्लेख नहीं मिला।

अब हाल में किए गए अध्ययनों में कुछ शिलालेखों में इस बात के साक्ष्य मिले हैं। दक्षिण भारत और दक्षिण-पूर्व एशिया में पत्थरों पर लिखने की परंपरा रही है। इन शिलालेखों में प्रयुक्त भाषा, जो पहली सहस्त्राब्दी के समय की थी, संस्कृत थी, जिसका अभिप्राय समझना सरल था। इन शिलालेखों में ग्रहणों और ग्रहों की युतियों संबंधी खगोलीय विवरण मिलते हैं। कंबोडिया में एक ऐसा शिलालेख मिला है, जिसमें किसी साधु द्वारा शिवलिंग की स्थापना के समय शिव के लिए 'शुक्रतारा प्रभावाय' विशेषण प्रयुक्त हुआ है, अर्थात वह जो शुक्र जैसी तीक्ष्ण कांति उत्पन्न कर सकता है। शिलालेख शुक्र जैसे चमकीले किसी तारे के प्रेक्षण की ओर संकेत करता है और शायद वह सुपरनोवा देखने की घटना थी। एक और ऐसा शिलालेख मिला है जो अजिला साम्राज्य के समय का है। इसमें कर्नाटक के वेनुरु नामक कस्बे में बाहुबली की विशाल प्रतिमा की स्थापना के बारे में लिखा है। एक समय में कर्नाटक जैन धर्म का प्रमुख केंद्र था। यद्यपि यह शिलालेख कन्नड़ लिपि में लिखा गया है, पर इसकी भाषा संस्कृत है। शिलालेख में उस समय की पूरी तारीख लिखी है दिन, महीना और वर्ष सहित। इस शिलालेख में सन 1604 के सुपरनोवा का भी जिक्र है।

शिलालेख में इस स्तंभ को क्षीरामबुधि में निशापति की संज्ञा दी गई है। निशापति चंद्रमा को कहते हैं। क्षीरामबुधि के दो अर्थ संभव हैं, कर्नाटक का बेलागोला कस्बा, और दूसरा आकाशगंगा। वर्ष 1604 का सुपरनोवा धनु राशि के क्षेत्र में देखा गया था, जो आकाशगंगा में स्थित है।

THE HINDU BusinessLine

Watch this season of IPL with a dash of data science from IIT

Jyoti Singh New Delhi | Published on March 22, 2019

Sambit Bal (Editor-in-chief, ESPNcricinfo), Rahul Dravid (former Indian Cricket Captain), Sanjay Manjrekar (ESPNcricinfo expert) and Prof. Raghunathan Rengaswamy (IIT-Madras)

The performance of players and match analysis of the upcoming season of Indian Premier League (IPL) will be based on new metrics that uses data science to analyze cricket. As cricket is evolving in different formats, methods of evaluating the game are also changing.

Researchers from Indian Institute of Technology Madras (IIT-M), Gyan Data (an IIT-M incubated company) and experts from ESPNcricinfo have launched Superstats - a new metrics to analyse the game of cricket. It is a combination of stats metrics - Luck Index, Forecaster and Smart Stats – based on data science to give a context to every event in a game and also venture into new territories such as luck and forecasting.

The new tools take into account score-cards, meaning ball by ball database of all IPL matches played in India in the last ten years. This helped researchers to develop an

algorithm-based on machine learning system. The algorithms process accurate, fast data, quantify impact of luck and analyze the real value of a player's performance in real-time. For viewers, this would be new experience to watch cricket where match information, analysis and projection are backed with data science.

The data-based metrics goes beyond conventional measurement systems like economy rate, strike rate and average. "We have combined big data, cricket intelligence, and also data science to produce a set of numbers that will help fans understand and appreciate the game better," said Sambit Bal, Editor-in-chief, ESPNcricinfo and ESPN South Asia.

"The quantification of matches has happened for the first time ever. This will impact the game and give much clearer picture of the ongoing game. With various other factors we have included luck index too which earlier was spoken only in qualitative terms," S Rajesh, Senior Editor Stats, ESPNcricinfo said while speaking to India Science Wire. He explained that luck index has an impact on the tournament and this way it would be easy to answer who is the luckiest player, luckiest team, head-to-head luck impact and so on.

Speaking at the launch of Superstats, Rahul Dravid, former Indian captain, said, "luck played a huge role in my career in 2009. I was on the verge of being dropped and was given an extra opportunity in Mohali against England. I was batting at number 3 and Stuart Broad bounces me. It was a top edge and as soon as I hit it, I thought 'oh god, I'm out again'. It just fell short of Matt Prior and the fine-leg fielder running in. I got a hundred in that game and went on to have a couple of good years, including three hundreds in England."

Raghunathan Rengaswamy of IIT Madras, said, "the problem approaching mechanism was same as we do in science. Here also we applied standard scientific principles. Based on the algorithms the strategies can be formulated for the matches to be played." He

added, “It was fascinating to see how we may apply abstract of some general scientific principles to solve the problems of different domains.”

Twitter: @ashajyoti11

(India Science Wire)

DownToEarth

New technique can make flexible electronics self-repairing too

Researchers claim the new technique is novel as it does not require rare materials or the addition of any complex circuitry

By Piyush Pandey Last Updated: Monday 25 March 2019

Flexible electronics is making tiny gadgets usable for a variety of applications such as wearable devices and strip thermometers. But circuits inside them are prone to breakage if such flexible electronic devices are bent in different directions over a period of time.

A new technique developed by a group of Indian and British researchers promises to overcome this problem. The group has demonstrated that it is possible to make flexible electronics self-healing.

Though the concept of self-healing electronics has existed for some time, researchers have claimed the new technique is novel as it does not require rare materials or the addition of any complex circuitry.

The current trend in modern electronics is to design lightweight and durable gadgets but at the same time they should be structurally rigid. This is achieved by using thin semiconductors and flexible substrates. However, in any electronic device you need thin wires to connect various semiconductor-based logic gates and other circuit components or “interconnects".

In the case of flexible electronics where you bend a gadget several times in different directions it becomes prone to breakage. This makes flexible electronics unreliable in their present form.

The researchers from the Indian Institute of Science, Bangalore, and University of Cambridge suspended copper microspheres having radius of 5 micrometres (one micrometer is one thousandth of a millimetre) in silicone oil which acts as insulating fluid.

To simulate a broken circuit, researchers submerged an open electrical connection in the mixture. When an electrical potential was applied across the gap (broken circuit) it created an electric field that attracted the copper spheres, and they started moving and forming chains of loosely bound clusters that bridged the gap.

When electrical potential is applied it results in the flow of current and produces heat. The heat generated, in this case through the chains, stabilised them. Thus a stable wire-like connection was made. The copper-sphere patch unlike previous methods is both flexible and stretchable. This means if a circuit breaks, it automatically creates a potential difference across the gap and would make the copper spheres move. More experiments,

however, are needed before self-repairing circuits can be integrated in to microelectronics devices.

The research team included Sanjiv Sambandan, Amit Kumar, Virendra Parab and Arindan Handu from Department of Instrumentation and Applied Physics, Indian Institute of Science; Li Ding, Pushkaraj Joshi and Chen Jiang from Department of Engineering, University of Cambridge.

The research results have been published in journal *Physics Review Applied*.

(India Science Wire)

गाँव कनेक्शन
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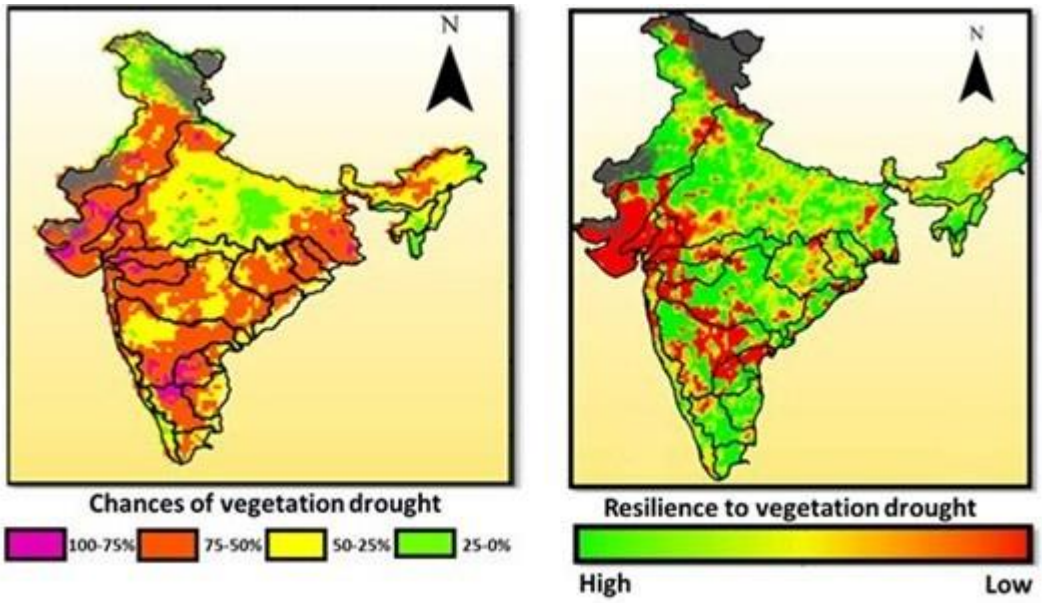
देश की नदी घाटियों में नहीं है सूखे से उबरने की क्षमता

28 March 2019Updated:29 March 2019

नई दिल्ली। तापमान, वर्षा और मिट्टी की नमी जैसे जलवायु कारकों में बदलाव का असर वनस्पतियों के फैलाव और उनकी वृद्धि पर पड़ता है। इन बदलावों के चलते भारत की नदी घाटियों के दो तिहाई हिस्से में मौजूद वन और कृषि क्षेत्रों में सूखे से उबरने की क्षमता नहीं है।

एक नए अध्ययन में शोधकर्ताओं ने वर्ष 1982 से 2010 तक 29 वर्षों के तापमान, वर्षा और मिट्टी की नमी के आंकड़ों आधार पर एक सूचकांक तैयार किया है। इस सूचकांक का उपयोग वनस्पतियों पर जलवायु के प्रभाव को समझने के लिए किया जा सकता है।

देश की 24 में से 16 नदी घाटियों के कम से कम आधे हिस्से में मिट्टी की नमी का स्तर कम होने के कारण यह क्षेत्र सूखे से सबसे अधिक प्रभावित हो सकता है। गंगा घाटी का सबसे अधिक क्षेत्र सूखे की संभावना से प्रभावित पाया गया है, जहां 25 प्रतिशत क्षेत्र सूखे के प्रति अधिक संवेदनशील है।



उत्तर-पश्चिम में स्थित माही, साबरमती और लूनी नदी घाटियों में भी सूखे का खतरा है। दक्षिण में पेन्नार घाटी का 96 प्रतिशत क्षेत्र मिट्टी की नमी कम होने पर सूखे से ग्रस्त हो सकता है। जबकि, कृष्णा, कावेरी और तापी नदी घाटियोंका 50 प्रतिशत हिस्सा सूखे के प्रति संवेदनशील है।इस अध्ययन में चरागाह, कृषि भूमि और प्राकृतिक वनस्पतियों सहित 10 वनस्पति प्रकारों को शामिल किया गया है।

भारतीय प्रौद्योगिकी संस्थान, इंदौर के शोधकर्ता श्रीनिधि झा ने बताया, "सूखे जैसी चरम जलवायु घटनाएं वनस्पति विकास को प्रभावित कर सकती हैं और सूखे की संभावना के चलते वनस्पतिक पारिस्थितिकी तंत्र कमजोर हो सकता है।इसी कारण, बदलती जलवायु परिस्थितियों को केंद्र में रखते हुए हमने वनस्पति सूखे की स्थिति का आकलन किया है और जानने की कोशिश की है कि भारत के वनस्पति आवरण में जलवायु में किसी उथल-पुथल का सामना करने के लिए कितना लचीलापन है।"

शोधकर्ताओं ने बताया कि देश के कुल फसल क्षेत्र का दो-तिहाई हिस्सा वनस्पति सूखे के प्रति संवेदनशील है, जिससे खाद्य सुरक्षा से जुड़ी चिंताएं बढ़ सकती हैं। वनस्पति सूखे का अर्थ यहां जलवायु परिवर्तन के कारण मिट्टी की नमी के स्तर में कमी से वनस्पतियों की वृद्धि एवं उनके वितरण पर पड़ने वाले प्रभाव से है। अध्ययन में शामिल शोधकर्ता डॉ मनीष गोयल ने बताया, "अधिकतर नदी घाटियों के कम से कम एक तिहाई क्षेत्र में

वनस्पति सूखे को सहन करने लिए लचीलापन नहीं है। इन क्षेत्रों में वनस्पति सूखा अधिक समय तक बना रह सकता है, जिससे पारिस्थितिक तंत्र खतरेमें पड़ सकता है। सदाबहार वनों और फसल क्षेत्रों सहित प्रत्येक वनस्पति प्रकारों का 50 प्रतिशत से अधिक क्षेत्र सूखे को झेलने के लिए तैयार नहीं है।" श्रीनिधि झा और डॉ मनीष गोयल के अलावा इस अध्ययन में आईआईटी, गुवाहाटी के आशुतोष शर्मा और बुधादित्य हज़रा शामिल थे। यह अध्ययन शोध पत्रिका ग्लोबल प्लेनेटरी चेंजेस में प्रकाशित किया गया है। (इंडिया साइंस वायर)

The Weather Channel | THE TIMES OF INDIA

More Nitrogen may Help Offset Effect of Climate Change on Wheat: Study

By S Suresh Ramanan | ISW | TWC India

Representational image

(Pixabay)

Increasing concentration of carbon dioxide and the associated rise in temperatures is affecting life on earth at different scales. Agricultural scientists are worried over sustaining food production and productivity of major crops like wheat, paddy, and maize. Over the years, studies have shown that elevated carbon dioxide levels will stimulate wheat productivity but the consequent rise in temperatures would have a negative impact.

The possibility of a hike in wheat productivity because of higher concentration of carbon dioxide has, in fact, led to some optimism in temperate countries like Greenland, Canada, Northern China and Europe since annual temperatures there are currently well below the optimum range for the growth of wheat. Any increase in temperature would be beneficial to them. In tropical countries like

India, however, there is heightened concern. It is already hot enough and further rises in temperature could prove disastrous.

In this backdrop, scientists at Indian Institute of Technology- Kharagpur explored the possibility of nutrient management as a way to sustain wheat productivity even at higher concentrations of carbon dioxide. They created an artificial carbon dioxide-rich environment and applied different levels of nitrogen to wheat crop along with the recommended dosage of fertilizers. The experiment was carried out over three consecutive Rabi seasons.

The scientists found that wheat yield and growth parameters improved with increasing levels of nitrogen application despite elevated carbon dioxide conditions and higher temperatures. Interestingly, under ambient carbon dioxide concentration, increasing the dosage of nitrogen did not bring any improvement in growth and yield of the crop.

Carbon dioxide enrichment had a positive effect on various growth parameters and yield attributes of wheat. Elevated carbon dioxide tended to increase crop growth rate and the fraction of leaf biomass and leaf nitrogen, especially for the nitrogen management using chemical fertilizer. Elevated carbon dioxideled to 17% increase in wheat grain yield above ambient as averaged over the nitrogen fertilized treatments. Elevated carbon dioxide also resulted in higher nitrogen use efficiency.

“Wheat production under the elevated carbon dioxide environment in Eastern India might be maintained or improved through the normal and increased dose of nitrogen fertilizer application. However, there is need for larger studies on the field with multi-location trials using different varieties, before any firm conclusion can be reached,” noted Dr Dillip Kumar Swain, who led the study, while speaking to India Science Wire.

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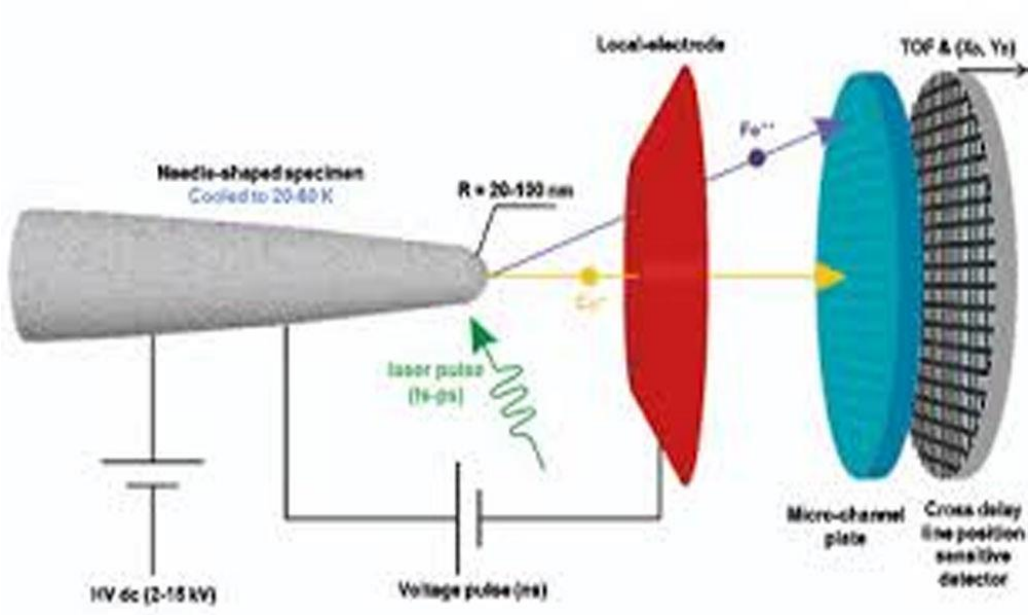
THE HANS INDIA

Giant LEAP to view materials one atom at a time

Dr P Surat | Updated On: 27 March 2019 12:02 AM



India is a leading player in nanotechnology research globally. To facilitate research in this sector, a national facility for Atom Probe Tomography has been established at the Indian Institute of Technology Madras, in partnership with several other institutes.

Nanotechnology involves studying materials at the atomic level. Atom Probe Tomography with local electrode is currently the only method that can determine both three-dimensional structure and the chemical composition of a material at an atomic resolution. Before the advent of this technology, transmission electron microscope was used to probe materials, but it can provide information only in two dimensions.

"Local Electrode Atom Probe (LEAP) has an extremely fast acquisition rate of atoms from the sample and can work for a wide range of materials," explained B S Murty, a scientist at IIT Madras.

In this method, the specimen is first shaped as sharp needle using a focussed beam of gallium ions. When high energy ions strike the sample, atoms eject from its surface. This helps in shaping the sample into a sharp needle.

Laser pulses are then applied to the needle-shaped specimen. This strips away the atoms that are present on its tip and converts them into charged ions. These ions hit a

detector that can register its position and the time it took to travel from the sample to the detector. These parameters are then used to infer the identity of the ion.

Thus, atom-by-atom, the LEAP microscope can create a three-dimensional image of the sample. This method is particularly useful in determining buried features and interfaces inside a material.

"This is for the first time when eight institutions in the country have contributed financially to set up such a platform at a cost of nearly Rupees 40 crores", Dr Murty told India Science Wire.

The partner institutes include Indian Institutes of Technology at Bombay, Delhi, Kanpur, Kharagpur, Madras and Ropar, and International Advanced Research Centre for Powder Metallurgy and New Materials (Hyderabad), Board of Research in Nuclear Sciences and DST Nano Mission.

Another feature of the new facility is that it is the first remotely operable LEAP in the world. Each of the partner institute has a local workstation that helps scientists to remotely interact with the facility. Using their respective workstation, they can log-in into the system, control experimental parameters, align the specimen, and acquire the data. The workstations have also been configured with full data analysis capabilities.

Apart from materials research, this technique is helpful for research in storage materials, bio-materials, catalytic materials and geochemistry. The facility also houses a Tecnai T12 TEM microscope that produces high-resolution, two-dimensional images, allowing for a wide range application. This facility hopes to cater to the advanced materials characterisation needs of Indian research community. (India Science Wire)

DownToEarth

Study finds gaps in conservation efforts in Western Ghats

Team of scientists have estimated the dhole population and its occupancy pattern in 16 protected forest reserves in Western Ghats

By S Suresh Ramanan Last Updated: Wednesday 27 March 2019

A new study has found that expansion of protected areasin the Western Ghats has not helped the lot of Dhole, commonly known as the Asiatic wild dog, even while enabling the recovery of populations of tigers and other big carnivores.

Dhole is an apex social carnivore in the tropical forests of South and South East Asia. Conservation of such carnivores leads to well-being of the entire ecosystem. There are many conservation projects based on this concept.

These have helped improve the population of bigger carnivores. However, there is not much knowledge about what has happened to smaller and less known but equally important animals like dholes.

As a part of a long-term study, a team of scientists have now estimated the dhole population and its occupancy pattern in 16 protected forest reserves and adjoining landscapes covering an area of 37,000 square kilometres in Karnataka portion of Western Ghats.

They found that there are 49 sites in the surveyed areas, which faced the threat of local extinction of the animal. The researchers used a unique methodology for the study.

They combined indirect sign survey data and dynamic occupancy modelling techniques. It is not possible to employ the normally used capture-mark-recapture camera trap-based survey methodfor estimating dhole population because they do not have uniquely identifiable marks on their bodies.

Generally, dholes hunt in packs and tend to venture into forested landscapes adjoining protected areas. Anthropogenic factors, which fragment and alter landscapes, affected dholes.

Under certain circumstances, the dhole population might even get restricted within the fragmented areas, forming meta-populations. If due conservation efforts are not taken towards these isolated populations, they might get wiped out. The new study has explicitly emphasised on conservation of these dhole metapopulations.

In a paper published in journal *Scientific Reports*, researchers emphasised that factors linked to human use of dhole habitats pose the highest level of threats to dhole populations.

“The presence of livestock adjacent to reserve areas negatively affected dhole occupancy. It affects habitat quality as livestock competes with the wild prey of dholes. Free-ranging feral dogs also adversely affect dhole populations because of competition for prey and by hosting a range of pathogens harmful to dholes,” the study has observed.

Speaking to *India Science Wire*, the lead author of the study, Arjun Srivathsa of the Wildlife Conservation Society-India, Bengaluru, said, “Tigers and leopards are likely a lot more resilient compared to dholes. Dholes are perhaps a lot more sensitive to forest cover and therefore require more nuanced approaches for population recovery”.

Besides Srivathsa, the research team included K Ullas Karanth, and N Samba Kumar of the Centre for Wildlife Studies, Bengaluru, and Madan K Oli from the University of Florida, USA.

(India Science Wire)

Vitamin Deficiency Widespread Among Healthy-Looking Urban Indians: Facts To Know

The study showed that the food people consume was only catering to a small amount of the actual requirement of vitamins. Deficiencies mainly result from inadequate diet.

by **India Science Wire** March 27, 2019, 6:50 pm

A large number of healthy looking urban Indians are suffering from vitamin deficiency, a new study has revealed.

Scientists from the Hyderabad-based National Institute of Nutrition (NIN) conducted a study on 270 apparently healthy adults (147 men and 123 women) between 30 and 70 years of age to check their vitamin levels. Blood levels of vitamins (A, B1, B2, B6, B12, folate and D) and homocysteine were assessed.

Vitamins are micro-nutrients essential for normal cellular and molecular functions, growth and maintenance of body tissues. The study has revealed that half the people had vitamin B2 deficiency followed by vitamin B6 deficiency (46%). These results are very important as it shifts the focus to the serious consequences of vitamin B2 deficiency, which has largely been ignored till date. Vitamin B1, B2 and B6 levels have received less attention, possibly owing to the lack of easily available and reliable techniques of measurement.

Vitamin B2 or riboflavin deficiency is associated with nerve-related diseases, anemia and heart diseases. Vitamin B6 deficiency is associated with failure of higher brain functions, fits, cancer, migraine, chronic pain, heart involvement, low immunity and depression. Vitamin B1 or thiamine deficiency results in dementia, Alzheimer's disease, cancer and metabolic diseases. Ignoring the deficiencies of vitamins other than folate, vitamin B12 and A can have serious consequences, the scientists have warned.

The study, published in journal Nutrition, also revealed deficiency levels of other vitamins; B12 (46%), folate (B9) (32%), D (29%), B1 (11%) and A (6%). Vitamins B2 and B12 affect the presence of folate in the body. The folate deficiency revealed in the

study could be due to low levels of vitamin B2 and B12. By increasing the levels of vitamin B2 and B12, folate deficiency can also be taken care of. Despite having abundant sunshine, Indians are prone to vitamin D deficiency.

This could be a risk factor for occurrence of diabetes. Compared to the other vitamins, prevalence of deficiency of vitamin A was relatively very low in the study participants which could be possibly due to adequate haemoglobin levels.

Team of researchers at National Institute of Nutrition

The study showed that food people consume was only catering for a small amount of the actual requirement of vitamins. Deficiencies mainly result from inadequate diet. The very high dietary inadequacy of vitamin B12 (96%) and folate (91%) observed in the study was a matter of concern. The high dietary inadequacy of vitamin B2 (71%) could be the result of milling of rice and wheat as riboflavin present in the germ and barn of grains is lost.

Low levels of vitamin B12 and folate to a large extent and vitamins B2 and B6 to a lesser extent are known to cause an increase in a form of amino acid, homocysteine, which is responsible for various blood-related problems and could result in strokes (brain and heart), fractures due to weak bones and dementia-type disorders. This condition was present in more than half (52%) of the study participants. Very high levels of homocysteine observed in men indicate a high-risk to the above conditions as compared to women.

The major component of an Indian diet consists of cereal/pulse-based foods. Less consumption of foods rich in vitamins such as vegetables, fruits and dairy products

results in deficiencies. Although men had higher intakes of the six types of vitamins than women, the same trend was not reflected in their blood levels. Though, intake of these vitamins may be adequate they may not be available to the body and cells in some individuals due various other reasons including age, environment, genetics, poor absorption, nutritional disorders and status of other nutrients.

“This study provides first-hand information to researchers, medical professionals and policymakers regarding the magnitude of the prevailing situation. Since this population constitutes main workforce, deficiency of micro-nutrients can have implications on their productivity,” Dr. G. Bhanuprakash Reddy, who led the team, told India Science Wire.

He said “no single food item or food group can satisfy the requirements all the micro-nutrients and hence having diversity (variety of fruits, vegetable, leafy vegetables, dairy products, nuts, germinated seeds) in the foods that we consume will meet our dietary requirements of nutrients particularly micro-nutrients”.

The research team included M. Sivaprasad, T. Shalini, P Yadagiri Reddy, M. Seshacharyulu, G. Madhavi, B. Naveen Kumar.

Courtesy: India Science Wire

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विटामिन की कमी से ग्रस्त हैं स्वस्थ दिखने वाले शहरी लोग

MAR 27, 2019

विटामिन की कमी से ग्रस्त हैं स्वस्थ दिखने वाले शहरी लोग

मोनिकाकुंडूश्रीवास्तव
Twitter handle: @monikaksrivast1

नई दिल्ली, 27 मार्च (इंडिया साइंस वायर): एक नए अध्ययन से पता चला है कि भारत में स्वस्थ दिखने वाले अधिकतर शहरी लोग विटामिन की कमी से ग्रस्त हैं।

हैदराबाद स्थित राष्ट्रीय पोषण संस्थान के वैज्ञानिक 30-70 वर्ष के लोगों में विटामिन के स्तर का अध्ययन करने के बाद इस नतीजे पर पहुंचे हैं। इस अध्ययन में 270 प्रतिभागी (147 पुरुष और 123 महिलाएं) शामिल थे। शोधकर्ताओं ने रक्त के नमूनों की मदद से विटामिन के विभिन्न रूपों (ए, बी1, बी2, बी6, बी12, फोलेट और डी) तथा होमोसिस्टीन की मात्रा का मूल्यांकन किया है।

शरीर में कोशिकीय एवं आणविक कार्यों, ऊतकों की वृद्धि और रखरखाव के लिए आवश्यक विटामिन एक प्रकार के सूक्ष्म पोषक तत्व होते हैं। इस अध्ययन में आधे लोग विटामिन बी2 और 46 प्रतिशत लोग विटामिन बी6 की कमी से ग्रस्त पाए गए हैं। ये परिणाम महत्वपूर्ण हैं, जो विटामिन बी2 की कमी को गंभीरता से लेने का संकेत करते हैं। हालांकि, लोग विटामिन की कमी को आमतौर पर नजरंदाज करते हैं और बी1, बी2 एवं बी6 विटामिनों की कमी की ओर कम ध्यान दिया जाता है। संभवतः इसका कारण इन विटामिनों को मापने के लिए विश्वसनीय और आसानी से उपलब्ध तकनीकों की कमी हो सकती है।

विटामिन बी2 या राइबोफ्लेविन की कमी तंत्रिका संबंधी बीमारियों, एनीमिया और हृदय रोगों से जुड़ी होती है। विटामिन बी2 या राइबोफ्लेविन की कमी तंत्रिका संबंधी बीमारियों, एनीमिया और हृदय रोगों से जुड़ी है। वहीं, विटामिन बी6 की कमी का संबंध मस्तिष्क की कार्यप्रणाली, दौरे, कैंसर, माइग्रेन, पुराने दर्द, हृदय रोग, कम प्रतिरक्षा और अवसाद से जुड़ा है। विटामिन बी1 या थायमिन की कमी से मनोभ्रंश, अल्जाइमर, कैंसर और चयापचय संबंधी रोग हो सकते हैं। वैज्ञानिकों ने आगाह किया है कि फोलेट, विटामिन बी12 और विटामिन-ए के अलावा अन्य विटामिनों की कमी को नजरंदाज करने से गंभीर परिणाम हो सकते हैं।

अन्य विटामिनों, जैसे- बी12 (46%), फोलेट यानी बी9 (32%), विटामिन डी (29%), बी1 (11%) और विटामिन ए (6%) की कमी का आकलन भी किया गया है। विटामिन बी2 और बी12 शरीर में फोलेट की उपस्थिति को प्रभावित करते हैं। शोधकर्ताओं का कहना है कि फोलेट की कमी विटामिन बी2 और बी12 के निम्न स्तरों का कारण हो सकती है। विटामिन बी2 और बी12 का स्तर बढ़ाकर फोलेट की कमी नियंत्रित कर सकते हैं। प्रचुर मात्रा में धूप होने के बावजूद भारतीय लोग विटामिन डी की कमी से ग्रस्त होते हैं। यह मधुमेह के लिए एक प्रमुख जोखिम हो सकता है। विटामिन के अन्य रूपों की अपेक्षा विटामिन ए में कमी के मामले काफी कम देखने को मिले हैं। शोधकर्ताओं का मानना है कि इसका कारण शरीर में पर्याप्त हीमोग्लोबिन का होना हो सकता है।

राष्ट्रीय पोषण संस्थान में शोधकर्ताओं की टीम

इस अध्ययन से पता चला है कि लोग भोजन में आवश्यकता से काफी कम विटामिन लेते हैं। पोषण में इस गिरावट के लिए पर्याप्त आहार न लेना जिम्मेदार हो सकता है। शोधकर्ताओं ने पाया कि आहार में विटामिन बी12 (96%) और फोलेट (91%) की कमी एक चिंता का विषय है। आहार में विटामिन बी2 (71%) की कमी का कारण चावल और गेहूं जैसे अनाजों को पीसकर खाने का परिणाम हो सकता है क्योंकि ऐसा करने से अनाज में मौजूद राइबोफ्लेविन नष्ट हो जाता है।

इस अध्ययन से जुड़े प्रमुख शोधकर्ता डॉ. जी. भानुप्रकाश रेड्डी ने इंडिया साइंस वायर को बताया कि “यह अध्ययन आम लोगों, चिकित्सकों और नीति निर्माताओं को विटामिनों की कमी से जुड़े खतरे के बारे में आगाह करने में मददगार हो सकता है। शरीर में सूक्ष्म पोषक तत्वों की कमी से कार्यक्षमता प्रभावित हो सकती है।" शोधकर्ता के अनुसार, "कोई भी एक खाद्य पदार्थ या संपूर्ण भोजन सभी सूक्ष्म पोषक तत्वों की आवश्यकताओं को पूरा नहीं कर सकता। अतः भोजन में विभिन्न प्रकार के फल, सब्जियां, डेयरी उत्पाद, सूखे मेवे, अंकुरित बीज आदि का सेवन सूक्ष्म पोषक तत्वों की जरूरतों को पूरा करने में मददगार हो सकता है।"

विटामिन बी12 का निम्न स्तर और काफी हद तक फोलेट, विटामिन बी2 एवं बी6 से एमीनो एसिड, होमोसिस्टीन के रूप में वृद्धि का कारण बनता है, जो विभिन्न रक्त संबंधी समस्याओं के लिए जिम्मेदार है। इसके परिणामस्वरूप मस्तिष्क एवं हृदय स्ट्रोक, कमजोर हड्डियों के कारण फ्रैक्चर और डिमेंशिया जैसे विकार हो सकते हैं। अध्ययन में आधे से अधिक (52%) लोगों में होमोसिस्टीन बढ़ा हुआ पाया गया है। हांलाकि, महिलाओं की तुलना में पुरुषों में उच्च मात्रा में होमोसिस्टीन का पाया जाना उनमें इन बीमारियों के प्रति खतरे की चेतावनी देता है।

अनाज अथवा दाल आधारित खाद्य पदार्थ भारतीय भोजन के प्रमुख घटक हैं। सब्जियों, फलों और डेयरी उत्पादों जैसे विटामिन से भरपूर खाद्य पदार्थों का सेवन कम करने से इस तरह की पोषण संबंधी समस्याएं होती हैं। महिलाओं की तुलना में पुरुष छह प्रकार के विटामिनों का अधिक सेवन करते हैं। पर, उनके रक्त में इनका स्तर अपेक्षित मात्रा में नहीं पाया गया। कई बार इन विटामिनों का सेवन पर्याप्त मात्रा में करने के बावजूद कुछ लोगों के शरीर और कोशिकाओं में ये उपलब्ध नहीं हो पाते हैं। इसके लिए उम्र, पर्यावरण, आनुवंशिकता, पोषण संबंधी विकार और अन्य पोषक तत्वों की स्थिति जैसे कारक जिम्मेदार हो सकते हैं।
शोधकर्ताओं में एम. शिवप्रसाद, टी. शालिनी, पी. यादागिरी रेड्डी, एम. शेषाचार्युलु, जी. माधवी और बी. नवीन कुमार शामिल थे। यह अध्ययन शोध पत्रिका न्यूट्रीशन में प्रकाशित किया गया है।

(इंडिया साइंस वायर)

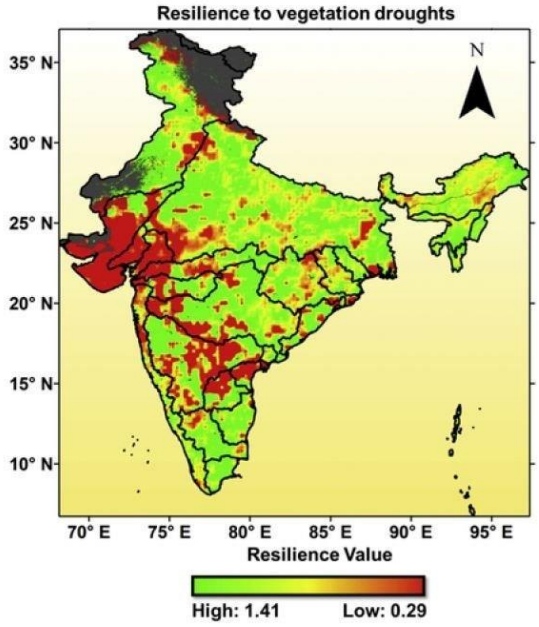
Keywords: vitamin deficiency, micronutrients, dietary intake, homocysteine, NIN, ICMR

भाषांतरण- शुभ्रता मिश्रा

Low Soil Moisture Posing Threat in Most River Basins

Research Stash News March 28, 2019

Factors like temperature, rainfall, and soil moisture affect the distribution and growth of vegetation. A study of these factors has shown that forest and croplands in two-thirds of river basins across India do not have the potential to cope with extreme climatic events such as drought.

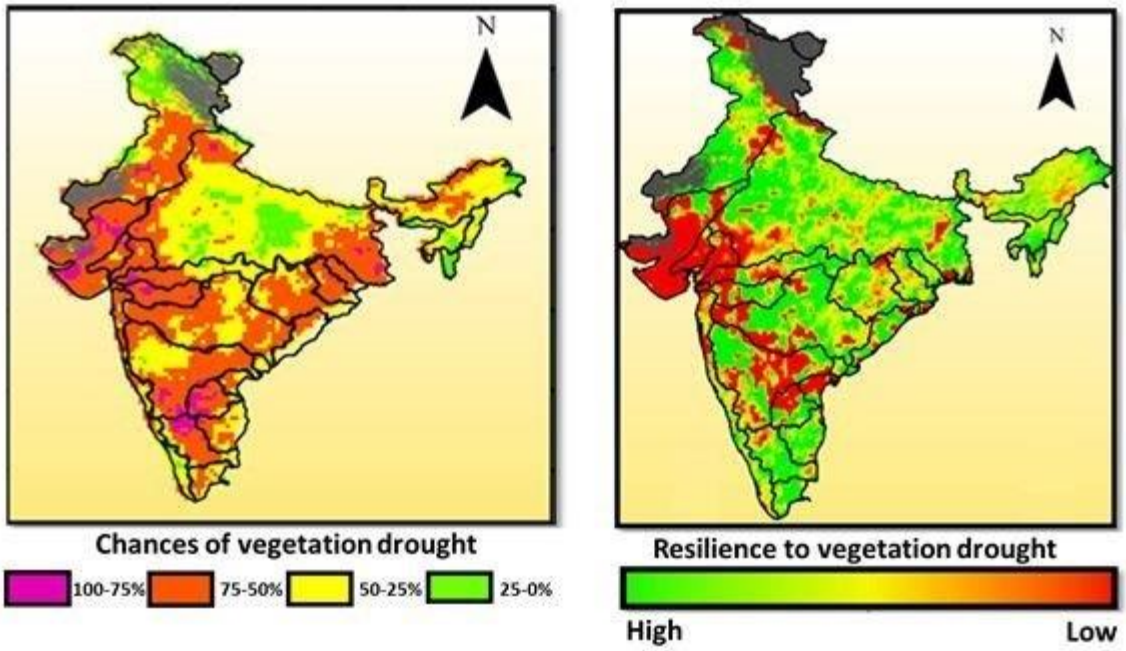


Spatial distribution of resilience values

An index based on the data of temperature, rainfall and soil moisture for 29 years from 1982 to 2010 has been developed to understand the effect of climate on vegetation.

At least half of 16 river basins have been found to be low in soil moisture, due to which the area can be affected most by drought. Area wise, most badly affected river basin was

Ganga, since 25% of its area is susceptible to droughts, according to the study. It was conducted in 10 vegetation cover regions such as grassland, agricultural land, and natural vegetation.



Low Soil Moisture Posing Threat in Most River Basins

Mahi, Sabarmati and Luni river basins located in the north-west region have also been found to be non-resilient to drought. In the south, 96 percent of the Pennar basin can suffer from drought because of low soil moisture. However, 50 percent of Krishna, Cauvery and Tapi basins are sensitive to drought.

"Extreme climate events can affect vegetation growth and activity. With increased chances of drought, vegetation ecosystems are likely to become more vulnerable in the future. This study identifies risks associated with vegetation cover (including croplands) and provides insights about resilience under changing climate conditions", explained Srinidhi Jha, a researcher of Indian Institute of Technology, Indore.

Two-thirds of the country's total cropland has been found to be sensitive to vegetation drought, which could raise the concern of food security. Vegetation drought is a condition of ecosystem affected by climate change low soil moisture, researchers said.
Dr. Manish Goyal, another researcher involved in the study, told to *India Science Wire*, "at least one-third of river basins are not resilient to vegetation drought. Which means that vegetation drought in these regions may last longer than usual causing continued danger to the ecosystems. Surprisingly, more than fifty percent of each vegetation types including evergreen forests and croplands are non-resilient."

Apart from Srinidhi Jha and Dr. Goyal, the research team also included Ashutosh Sharma and Budhaditya Hazra (IIT, Guwahati). This study has been published in the journal *Global Planetary Changes*.

(India Science Wire)

By Umashankar Mishra

EASTERN MIRROR

Gandhi: Fitness freak, champion of sustainable food and a pioneering vegan

New Delhi, March 28 (India Science Wire): Walking and engaging in physical activity every day, good intake of fresh vegetables and fruits, consuming food items low in sugars, salt and fats, avoid taking tobacco and alcohol, maintaining environmental cleanliness and personal hygiene.

This may sound pretty much like advisory issued by the World Health Organisation to keep non communicable as well as communicable diseases at bay. But these are actually the tenets of good health Mahatma Gandhi preached and practiced a century ago.

Many of these ideas, feel nutritionists and public health experts, are greatly relevant now and have backing of scientific evidence. They can help fight health problems ranging from malnutrition to heart disease.

Gandhi believed that excessive eating, too frequent meals and overindulgence of concentrated starches and sugars were unhealthy and caused diseases. He suggested avoiding sweets as much as possible and consuming gur (jaggery) in small quantities. He was against polishing of rice or refining of wheat flour. “Sieving of the flour should be avoided. It is likely to remove the bhusi or the pericarp which is a rich source of salts and vitamins, both of which are most valuable from the point of view of nutrition,” he had written.

All this is in tune with the current recommendations on nutrition,” nutritionists Subbarao M. Gavaravarapu and R. Hemalatha from the Hyderabad-based National Institute of Nutrition (NIN) have observed in an analysis published in a special issue of the Indian Journal of Medical Research (IJMR). “Gandhiji recognized the need for including

fats/oils in the diet. Even today, the Dietary Guidelines developed by NIN suggest that about 10% of the total daily calories should be met from visible fats."

The remarkable aspect of some of Gandhi's diet recommendations is that they are relevant even today, the researchers have observed. "Today, beset as we are with lifestyle diseases driven by our faulty food choices and sedentary habits, 'locally grown', 'less oil and salt', 'less sugary,' 'farm fresh', 'low fat' have become much bandied words. Nutrition science extols the virtues of fresh vegetables and fruits, probiotic potential of curds or yoghurt and decries ill-effects of sugar and refined flours. The virtues of walking, regular exercise and good sanitary habits are all important. These were the very by-words that Gandhi lived by," the paper has concluded.

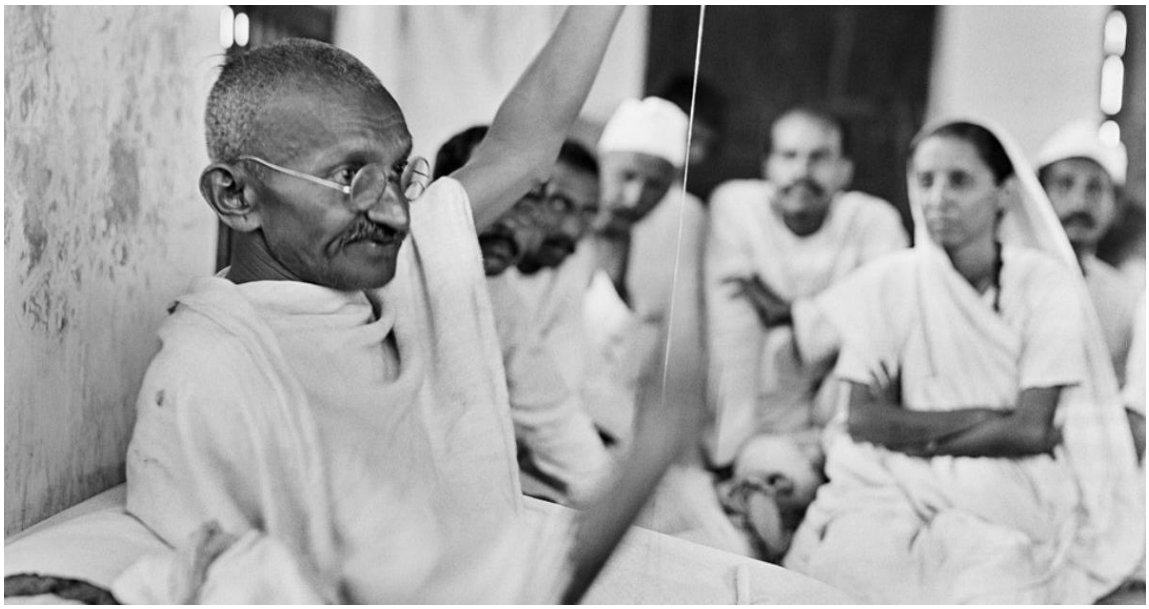
Through his interaction with scientists, Gandhi exchanged knowledge and even influenced medical research in British India to some extent. Robert McCarrison, the first Director of NIN, used to have long conversations with Gandhi on diet and dietetics, particularly on the use of milk as Gandhi had taken a vow not to drink milk. "That relationship resulted in creating a strong foothold in the area of nutrition and accelerating research," pointed out Dr Balram, Bhargava, director general of the Indian Council of Medical Research (ICMR).

In the field of communicable disease, Gandhi emphasized the importance of eliminating mosquito breeding sites and regular monitoring of water containers as a measure to prevent breeding of mosquitoes and malaria. He considered such methods more effective than distribution of quinine tablets. Gandhi also sought elimination of diseases like leprosy and tuberculosis that bred stigma and untouchability through isolation of those infected.

Gandhi was a fitness freak. He walked around 18 km every day for nearly 40 years. During his political campaigns from 1913 to 1948, he walked a total of 79,000 km, which is equivalent to walking around the earth twice, according to his health records published in the journal. Yet he struggled with several health issues – pleurisy (1914), malaria (1925, 1936 and 1944), gastric flu (1939) and influenza (1945). He was operated on for piles (1919) and severe appendicitis (1924). But he was back on his feet every time, largely due to his disciplined lifestyle which included focusing on physical fitness and a balanced diet.

“Although Gandhiji was never against allopaths, vaidyas and hakims, his preference lay with naturopathic medicines. He often said that naturopathy was his hobby. He argued that if disease was a result of breaking nature’s law, nature would be able to rectify it. He practised naturopathy for more than fifty years,” Dr Bhargava has noted. “He was not partial towards any system but believed in the power of preventive care and treatment for all.”

कुपोषण से हृदय रोग तक लड़ने में मदद कर सकते हैं गांधी के सिद्धांत



दिनेश सी. शर्मा

पैदल चलना, शारीरिक गतिविधियां, ताजा सब्जियों व फलों का सेवन, शर्करा, नमक तथा वसा वाले खाद्य पदार्थों का कम सेवन, तंबाकू तथा शराब से दूरी और पर्यावरणीय एवं व्यक्तिगत स्वच्छता बनाए रखना। कुछ लोगों को ये बातें विश्व स्वास्थ्य संगठन द्वारा जारी गैर-संचारी एवं संचारी रोगों से बचाव के लिए जारी सलाह लग सकती हैं। पर, अच्छे स्वास्थ्य से जुड़े ये कुछ ऐसे सिद्धांत हैं, जिन पर एक सदी पहले खुद महात्मा गांधी अमल करते थे और लोगों के बीच इनका प्रचार भी करते थे।

इनमें से कई विचारों को आज वैज्ञानिक साक्ष्यों का समर्थन प्राप्त है और पोषण विशेषज्ञ भी उन्हें प्रासंगिक मानते हैं। विशेषज्ञों का कहना है कि कुपोषण से लेकर हृदय रोगों जैसी स्वास्थ्य समस्याओं से लड़ने में ये सिद्धांत मदद कर सकते हैं।

गांधी का मानना था कि अत्यधिक भोजन, बार-बार खाना और स्टार्च या शक्कर का अधिक सेवन सेहत के लिए ठीक नहीं है। उन्होंने मिठाईयों से बचने और कम मात्रा में गुड़ का सेवन करने का भी सुझाव

दिया। वह चावल को पॉलिश करने या गेहूं के आटे को छानकर उपयोग करने के पक्ष में नहीं थे। उन्होंने लिखा है कि "आटे को छानने से बचना चाहिए। ऐसा करने से उसमें मौजूद चोकर अलग हो जाता है, जो लवणों और विटामिन का एक समृद्ध स्रोत है। ये दोनों तत्व पोषण के दृष्टिकोण से काफी महत्वपूर्ण हैं।"

हैदराबाद स्थित राष्ट्रीय पोषण संस्थान (एनआईएन) के पोषण विशेषज्ञ सुब्बाराव एम. गवरवरपु और आर. हेमलता ने बताया कि "ये तथ्य पोषण पर एनआईएन की वर्तमान सिफारिशों के अनुरूप हैं। गांधीजी आहार में वसा / तेल को शामिल करने की आवश्यकता को पहचान लिया था। आज भी, एनआईएन द्वारा विकसित आहार संबंधी दिशा निर्देश बताते हैं कि कुल दैनिक कैलोरी का लगभग 10 प्रतिशत वसा से मिलना चाहिए।" इससे संबंधित अध्ययन इंडियन जर्नल ऑफ मेडिकल रिसर्च में प्रकाशित किया गया है।

" गांधी का मानना था कि अत्यधिक भोजन, बार-बार खाना और स्टार्च या शक्कर का अधिक सेवन सेहत के लिए ठीक नहीं है। उन्होंने मिठाईयों से बचने और कम मात्रा में गुड़ का सेवन करने का भी सुझाव दिया। "

इस अध्ययन में कहा गया है कि "जीवन शैली से जुड़े रोगों के बढ़ने पीछे गलत खानपान और शारीरिक गतिविधियों का न होना प्रमुख है। इसके विपरीत, 'स्थानीय रूप से उगाए गए', 'कम तेल और नमक', 'कम शर्करा,' 'फार्म फ्रेश', 'कम वसा' जैसे शब्द प्रचलित हो रहे हैं। यह सही कि पोषण विज्ञान ताजा सब्जियों और फलों के गुणों एवं दही की प्रोबायोटिक क्षमता बढ़ाने और चीनी तथा परिष्कृत आटे के दुष्प्रभाव को कम कर सकता है। पर, पैदल चलना, नियमित व्यायाम और स्वच्छता संबंधी आदतें भी महत्वपूर्ण हैं। ये कुछ ऐसे सिद्धांत थे, जिन पर गांधी अमल करते थे।

वैज्ञानिकों के साथ अपनी बातचीत के जरिये गांधी स्वास्थ्य संबंधी ज्ञान का आदान-प्रदान करते थे और उन्होंने ब्रिटिशकालीन भारत में चिकित्सा अनुसंधान को भी कुछ हद तक प्रभावित किया। एनआईएन के पहले निदेशक रॉबर्ट मैककारिसन ने भोजन और आहार विज्ञान पर गांधी के साथ लंबी बातचीत की, खासकर दूध के उपयोग पर क्योंकि गांधी ने दूध नहीं पीने का संकल्प लिया था। भारतीय चिकित्सा अनुसंधान परिषद (आईसीएमआर) के महानिदेशक डॉ बलराम भार्गव ने कहा कि "यह संबंध पोषण के क्षेत्र में मजबूती से आगे बढ़ने और अनुसंधान को बढ़ावा देने में मददगार साबित हुआ है।"

संचारी रोग के क्षेत्र में, गांधी ने मच्छरों के प्रजनन को रोकने के उपाय के रूप में मच्छर प्रजनन स्थलों को खत्म करने और पानी के कंटेनरों की नियमित निगरानी के महत्व पर जोर दिया। उन्होंने ऐसे

तरीकों को कुनैन की गोलियों के वितरण से अधिक प्रभावी माना। गांधी ने कुष्ठ और तपेदिक जैसे रोगों के उन्मूलन का प्रयास किया, जो सामाजिक कलंक और अस्पृश्यता जैसी बुराइयों के लिए जाने जाते थे।

गांधी अच्छी फिटनेस के पक्षधर थे। वह लगभग 40 वर्षों तक हर दिन लगभग 18 किलोमीटर पैदल चलते थे। वर्ष 1913 से 1948 तक के अपने राजनीतिक अभियानों के दौरान, उन्होंने कुल 79,000 किलोमीटर दूरी तय की, जो उनके स्वास्थ्य रिकॉर्ड के अनुसार दो बार पृथ्वी का चक्कर लगाने के बराबर है।

इसके बावजूद गांधी को फेफड़े के आवरण में शोथ (1914), मलेरिया (1925, 1936 एवं 1944), इन्फ्लुएंजा (1945) जैसी बीमारियों से संघर्ष करना पड़ा। बवासीर (1919) और गंभीर अपेंडिसाइटिस (1924) के लिए उनका ऑपरेशन किया गया था। लेकिन हर बार वह बीमारियों से निजात पाने में सफल रहे, जिसका मुख्य कारण उनकी अनुशासित जीवन शैली थी, जिसमें शारीरिक फिटनेस और संतुलित आहार मुख्य रूप से शामिल था।

डॉ भार्गव ने बताया कि “गांधीजी एलोपैथिक डॉक्टरों, वैद्यों और हकीमों के खिलाफ नहीं थे, लेकिन उनकी प्राथमिकता में प्राकृतिक चिकित्सा प्रमुखता से शामिल थी। वह कहते थे कि प्राकृतिक चिकित्सा उनका शौक है। उन्होंने तर्क दिया कि यदि बीमारी प्रकृति के नियम को तोड़ने का परिणाम थी, तो प्रकृति इसे सुधारने भी सकती है। उन्होंने 50 से अधिक वर्षों तक प्राकृतिक चिकित्सा का अभ्यास किया। वह किसी प्रणाली के पक्षधर नहीं थे, पर बीमारियों की रोकथाम और उपचार की शक्ति में उन्हें विश्वास था।”

इंडिया साइंस वायर

भाषांतरण : उमाशंकर मिश्र

THE HINDU BusinessLine

`Whispers of Wind' on radio launched

Jyoti Singh New Delhi | Published on March 29, 2019

Climate change and global warming is a challenge across the globe. To bring this issue to common people, a radio serial named 'Whispers of Wind' has been developed. The series has 52 episodes and has been produced by Vigyan Prasar, an autonomous body of Department of Science and Technology, and All India Radio.

The series will be broadcast on All India Radio from March 31, 2019 onwards. These episodes will be translated in 19 Indian languages and broadcast from 121 All India Radio centres (14 FM and 107 Medium Wave Stations). Each episode is of 27 minutes duration. Episodes will be in the documentary, drama or feature format. Some attractive prizes will be given to listeners for answering the question asked at the end of each episode. There are prizes for asking the best question also.

"We hope the series will provide engaging content, ensuring participation of people in mitigation and adoption measures as envisaged in India's National Action Plan on Climate Change" said Nakul Parshar, Director, Vigyan Prasar.

More than 400 subject experts, writers, scientists and transcribers were involved in develping the program. “The program is made to provide participatory listening experience. When there are reports and clear indications of climate change across the globe it becomes imperative to communicate people and make them aware about the consequences of climate change” said B K Tyagi, Scientist and project coordinator, Vigyan Prasar.

The main objective behind this series is to create awareness about the challenges of climate change and promote understanding of climate change science, adaptation, mitigation, energy efficiency, and natural resource conservation.

“In the era of internet, radio has its own place and reach. To tap this potential these radio serials have their own place. There are remote areas where there is no or bad internet connect. These radio serials will be focusing those particular areas” said M Shailja Suman, Deputy Director, All India Radio.

Understanding the science of climate change and global warming, the natural and anthropogenic factors responsible for climate change, impact of climate change, preparedness of the global community to address the challenges of climate change, norms, conventions, and institutions to cope with climate change, India and climate change, institutional framework in India, mitigation and adaptation are the areas that have been covered under the theme.

Earlier, Vigyan Prasar has produced radio serials on themes like sustainable development, astronomy, understanding and managing disaster management, grassroot innovation and so on.

Twitter: @ashajyoti11

(India Science Wire)

दैनिक दबंग दुनिया
निष्पक्ष नज़र, निष्पक्ष खबर

जलवायु परिवर्तन पर 52 कडियों का रेडियो धारावाहिक रविवार से

By Dabangdunia News Service | Publish Date: Mar 29 2019 11:48PM

नई दिल्ली। जलवायु परिवर्तन और 'ग्लोबल वार्मिंग' के बहुआयामी पहलुओं पर 52 कडियों का एक रेडियो धारावाहिक तैयार किया गया है जिसका प्रसारण 31 मार्च से 19 भारतीय भाषाओं में आकाशवाणी पर किया जायेगा। यह धारावाहिक विज्ञान एवं प्रौद्योगिकी विभाग की स्वायत्त संस्था विज्ञान प्रसार और लोक प्रसारक आकाशवाणी ने मिलकर तैयार किया है। हिंदी में इसे 'बदलती फिजाएँ' और अंग्रेजी में 'व्हिस्परर्स ऑफ विंड' नाम दिया गया है। आकाशवाणी के 121 केंद्र 19 भारतीय भाषाओं में इसका प्रसारण करेंगे। इनमें 14 एफएम स्टेशन तथा 107 मीडियम वेव स्टेशन शामिल हैं।

आकाशवाणी दिल्ली द्वारा इसका प्रसारण 31 मार्च से प्रत्येक रविवार को एफएम गोल्ड चैनल, 100.1 मेगाहट्र्ज पर दोपहर ढाई से तीन बजे तक और अंग्रेजी मे राजधानी चैनल मीडियम वेव, 666 किलोहट्र्ज पर रात्रि 9.30 बजे से 10 बजे तक किया जाएगा। अन्य भाषाओं मे उस राज्य के

राजधानी सहित विभिन्न आकाशवाणी केन्द्रों से किया जाएगा। धारावाहिक की प्रत्येक कड़ी 27 मिनट की है, जिसका मूल उद्देश्य जलवायु परिवर्तन विज्ञान और उससे उत्पन्न चुनौतीयों के बारे में आम लोगों में जागरूकता पैदा करना है। धारावाहिक में अनुकूलन राहत, ऊर्जा दक्षता और प्राकृतिक संसाधन के संरक्षण की समझ को बढ़ावा देने का प्रयास किया जायेगा। साथ ही जलवायु परिवर्तन से निपटने के कई सफल प्रयासों को भी शामिल किया गया है। प्रत्येक कार्यक्रम के अंत मे श्रोताओं से उस कड़ी से संबन्धित दो सवाल पूछे जाएंगे और सही जवाब भेजने वाले श्रोताओं को विज्ञान प्रसार द्वारा पुरस्कार के रूप मे एक किट भेजा जाएगा।

तारों के गोलाकार गुच्छे में एक नए वर्ग की खोज

एस्ट्रोसैट के जरिए खगोल वैज्ञानिकों ने खोजी पराबैंगनी तारों की नई श्रेणी

धरती से 47 हजार प्रकाश वर्ष दूर है तारों का गुच्छा एनजीसी-2808

पत्रिका न्यूज़ नेटवर्क

बेंगलूरु. भारतीय अंतरिक्ष अनुसंधान संगठन (इसरो) की अंतरिक्ष वेधशाला एस्ट्रोसैट का उपयोग करते हुए सिलकंसुल्ल और तुर्की के खगोलविदों ने तारों के गोलाकार गुच्छे (ग्लोबुलर क्लस्टर) एनजीसी 2808 में पराबैंगनी तारों के एक नए वर्ग की खोज की है।

गोलाकार तारों के गोलाकार गुच्छों में हजारों से लाखों तारे होते हैं, जो एक हजार के रूप में परिवर्तन करते हैं। इन तारों के गुरुत्वाकर्षण के पारस्परिक बल गुच्छा अपनी आकृति बनाए रखते हैं। यह माना जाता है कि इन सभी तारों का जन्म लगभग एक ही समय में एक साथ हुआ होगा। हमारी आकाशगंगा मंदाकिनी या मिल्की-वे में लगभग 150 गोलाकार गुच्छे हैं, इनमें से कुछ सौरमंडल अवस्थापन के समय पृथ्वी पर होंगे। तारे जन्म लेते हैं, मुख्यक्रम में पहुंचते हैं और फिर उनका अंत होता जाता है। सिद्धांत यही इन विभिन्न निर्माणों के तारों में भी समय लगता है कि हमारी धारणा के परे है।

भारतीय अंतरिक्ष विज्ञान और प्रौद्योगिकी संस्थान (आईआईएसटी), सिलकंसुल्ल में एस्ट्रोसैट के स्पेक्ट्रोस्कोपिक उपकरण और अनुसंधान दल की सदस्य, डॉ. जीन ने बताया कि यह प्रणाली तारों को तेजी से विकास करते हैं, फिर कुछ लाख वर्षों तक प्रकाशित करना एक अनोखा दृश्य और भी प्रस्तुत होते हैं। खासकर, हमारी सूर्य या उससे छोटे तारों, आकार वाले में भी-भी किए गिए होते हैं। चूंकि, तारों के एक गोलाकार गुच्छे में विभिन्न द्रव्यमान वाले तारों होते हैं, जिनकी उत्पत्तियां अलग-अलग समय हुआ होती हैं।

इसलिए, किसी समय हम इनमें एक साथ, अपने विकास के विभिन्न चरणों में विभिन्न द्रव्यमानों के तारों की अवस्था देख सकते हैं। आज से 5 अरब वर्ष बाद जब सूर्य लाल दैत्य का विकास चरण आए, तब यहां से तो इसी तारों जैसी अवस्था को देखा जाएगा। यह तारों के अंतिम चरण होता है और वे अंतत पराबैंगनी प्रकाश में बहुत उज्ज्वल बनते हैं क्योंकि वे अत्यधिक गरम रूप से अंतिम चरण होते हैं। इसलिए तारों के गोलाकार गुच्छे खगोलीय विकास के सिद्धांतों का परीक्षण करने के लिए अच्छी प्रयोगशाला साबित होते हैं।

एस्ट्रोसैट के जरिए खोले गए एनजीसी-2808 गोलाकार गुच्छे में तो एक है, जो करीबन 47 हजार प्रकाश वर्ष की दूरी पर स्थित है। इस गुच्छे का अध्ययन करने के लिए डॉ. जयचंद्रन के दल ने एस्ट्रोसैट में लगी अल्ट्रावायलेट इमेजिंग टेलीस्कोप (यूवीआईटी) का उपयोग किया। इस खोज कार्य का नेतृत्व करने वाले आईआईएसटी की प्रो. जीन ने कहा कि गोलाकार गुच्छों में तारों की विभिन्न खगोलीय खोजों का एक पराबैंगनी प्रकाश में परिवर्तित प्रभाव कारण बताने में और पूर्वकथनों ने तो एक अनुमान लगाए गिया।

गोलाकारों की विभिन्न पराबैंगनी स्थितियों के माध्यम से तारों की श्रेणियों 12 हजार से अधिक तारों की अलग-अलग पहचान करने में कामयाब मिली है। इस अध्ययन से जुड़े टाटा मूलभूत अनुसंधान संस्थान के प्रोफेसर दर्शन सोमने कहा कि विभिन्न स्थितियों में उनकी चमक को नापकर हम इन पराबैंगनी-प्रकाशवान तारों के तापमान का अनुमान लगा सके, फिर इसके द्वारा हम इन तारों को अलग-अलग समूहों में बांट सके।

यह एक अनुमान लगाया गया है कि ऐसे समूहों में करीबन 5 एकड़ी तारे होते हैं। करीबन इतना जन्म एक ही निकाल चुका और वैसे के कारण ये हुआ था, पर इसके विपरीत, इस के अध्ययनों से पता चला है कि कई गोलाकार गुच्छों में तारों की एक से अधिक पीढ़ियां मौजूद हैं। यह अंतर के कारण तेज है अपने अपने तरह से उत्पन्न तारों का जन्म है, हालांकि एक प्रकाशित सिद्धांत द्वारा इस दिशा को बहुत कुछ समझा जा सकता है।

एनजीसी 2808 कुछ विशिष्ट है क्योंकि इसके दूसरा प्रकाश में अवलोकन से सामने आता है कि इसमें तारों की कम से कम पांच अलग-अलग उपश्रेणियां मौजूद हैं।

पूर्वकथनों पर आधारित सिद्धांतों के संशोधन का उपयोग करते हुए, खगोलविदों ने प्रत्येक सिद्धांत में उनकी चमक के आधार पर तारों के विभिन्न समूहों को अलग-अलग करने का प्रयास किया और अपेक्षानुसार प्रत्येक सिद्धांतों वाला में तारों की पहचान करने में कामयाब रहे।

हालांकि, उन्होंने पाया कि यह वाला की पांच कि निर्धारित तारों का एक वर्ग, जिसे ब्लू स्ट्रैगलर्स कहा जाता है, वास्तव में दो अलग-अलग समूहों के मिलाकर बनी होते हैं। चूंकि, आकाश में तारों की श्रेणियां उन्हें पता थी, इसलिए वे यहां से पेश कर कि ऐसे तारों के विभिन्न वर्गों को गुच्छों में यहां किया गया है। उनका यह निरीक्षण यहां एक रूप के संकेतक उपकरणों के साथ आकाशगंगा की और प्रकाश करता है, जो यह बताता है कि कैसे किसी एक समूह में तारों की विभिन्न उपश्रेणियां प्रकाशित उत्पन्न होती हैं। पूर्वकथनों की अपने उत्पन्न निष्कर्ष करता (रिजल्टेंट) और इसके नई सिद्धांतों का लाभ उठाते हुए अब गोलाकार समूहों के अलग-अलग तारों के इसी प्रकार के अध्ययन के सकारात्मकों को यह समझने में मदद मिल सकती है कि ऐसे समूहों में ये तारों उपश्रेणियां कैसे बनती हैं।

रेवण्णा के बयान से अंबरीश के प्रशंसकों में नाराजगी

मुझे कुछ सीखने की जरूरत नहीं : रेवण्णा

पत्रिका न्यूज़ नेटवर्क

मंडया. लोक निर्माण मंत्री एच.डी. रेवण्णा के मुख्यमंत्री के विकास दिए बयान पर अंबरीश के प्रशंसकों ने आक्रोश व्यक्त किया है। प्रशंसकों ने रेवण्णा के बयान के लिए माफी मांगने की मांग करते हैं।

गत्ती, रेवण्णा ने इस बात को स्वीकार करते हुए कहा है कि वे 2018 के चुनाव में हार गए हैं, जिसे वे उनके कमजोर लोगों लोकप्रियता से कुछ दोस्तों की अत्यधिकता नहीं है। मैंने मुख्यमंत्री को लोकप्रियता बनाने के लिए कुछ सीखने की जरूरत नहीं है, विकास हम बनाने की लोकप्रियता मांगने का कोई नहीं उत्पन्न है। उन्होंने कहा कि मुख्यमंत्री ने अंबरीश बाबा के विकास कार्यों के पश्चात रेवण्णा ने मुख्यमंत्री की मंडया लोकसभा सीट के लिए उम्मीदवार घोषित करते हुए कहा कि यदि अंबरीश का विकास नहीं करते हैं तो मैं उनके खिलाफ चुनाव लड़ूंगा। रेवण्णा के बयान से अंबरीश के प्रशंसक अब गुस्सा हैं। एक ही प्रशंसक ने कहा है कि वह विकास नहीं (एचडी कुमारस्वामी के पुत्र) ने मंडया पर ध्यान नहीं लगाया है।

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Grassroots

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Northeast losing canopy cover at an alarming rate

SARAH IQBAL, New Delhi

A new study has warned that parts of Assam and Arunachal Pradesh are losing canopy cover at an alarming rate. Researchers from the Indian Institute of Remote Sensing, Dehradun, examined the pace of deforestation in the elephant landscape of the Northeast, covering 42000 square kilometers in Assam and Arunachal Pradesh. The historical information about forest cover in the region was collected from the US Army topography maps dating back to 1924. The information for the years 1975, 1990, 2000 and 2009 was retrieved from satellite images taken by the Indian Remote Sensing Satellite, LISS III and the Landsat image archives of NASA.

Computer algorithms classify satellite image pixels into different categories (forests, rivers and other types of vegetation).This visual information in the images was first calibrated with land cover data gathered from ground surveys and then used to piece together the entire deforestation history of the region

The analysis revealed that about 7590 square kilometers of forests have been lost between 1924 and 2009 with a mean deforestation rate of 0.64 per cent (for 85 years).Researchers also found that the degree of deforestation was greater in Assam compared to Arunachal Pradesh, possibly due to its hilly terrain which is difficult to tread upon. In Assam, districts like Dhemaji, Sonitpur, Lohit and Tinuskia suffered the highest area-wise loss in forest cover. The green cover of lesser Himalayas in Northeast is undergoing rapid changes due to rising population, industrial development and urbanization, the study says.

"The 1924 map of the US Army does not provide the same accuracy than remote sensing technology. This may slightly alter the deforestation rate. But, in spite of this minor issue, what's noteworthy is that, the speed of deforestation is catastrophic," pointed out Jean-Philippe Puyravaud, head of Sigur Nature Trust, who was not connected with the study, while speaking to India Science Wire.

Using the land-use changes of 1990-2009, researchers have projected the likely deforestation in the region for the year 2028. If the current rate remains undeterred, more than 9000 square kilometers of area could be devoid of forests by 2028, predict scientists. Such losses could exacerbate incidents with elephants that have lost their habitat. This will be devastating for both the wildlife and humans living in adjoining areas. The study has been published in Journal *Current Science*.

"Deforestation and loss of wildlife habitat in upper Assam is likely to influence not only the adjoining Bhutan and Arunachal Pradesh, but also lower Assam so far as the wildlife and ecosystems are concerned. Therefore, forests need to be restored to their original status for long-term survival of humans and wildlife," the study has suggested. ■

(Courtesy: India Science Wire)

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There is a long way to go in reducing child mortality

MONIKA KUNDU SRIVASTAVA, New Delhi

A new study has warned that over two-thirds of the districts in India are unlikely to achieve the UN Sustainable Development Goal (SDG) target of reducing deaths to 25 or less per 1000 live births in under 5-year old children and 12 or less per 1000 live births for newborns by 2030. The study is based on analysis of data from the 2015–2016 National Family Health Survey (NFHS).

The results of the study done by Jayanta Kumar Bora from the International Institute for Applied Systems Analysis, Austria, and Dr Nandita Saikia from Jawaharlal Nehru University (JNU), have been published in journal *PLoS ONE*.

The results indicate that on an average, estimated deaths of under five children is double the targeted figure (49.4 against targeted 25 deaths per 1000 live births) while estimated deaths of newborns is about 2.4 times greater than the targeted one (29.2 against targeted 12 deaths per 1000 live births).

Of the 613 districts considered, 9 per cent and 14 per cent have already achieved the target for reducing the deaths in newborns and under 5-year-old children, respectively. But nearly half the districts (315) are unlikely to achieve the target by 2030. Most of the poorly performing districts are located in Assam, Bihar, Chhattisgarh, Haryana, Madhya Pradesh, Uttar Pradesh and Uttarakhand.

About 67 per cent of the districts is not likely to achieve the target for male newborns, whereas 46 per cent is not likely to achieve the target for female newborns by 2030. Most of the districts unlikely to achieve the target to reduce deaths in female newborns are located in north-central and eastern belt of the country.

For male newborns, north-central-west, north-east and south-east are unlikely to meet the target by 2030. This includes rich states like Andhra Pradesh, Gujarat, Haryana, Telangana. In Chhattisgarh and Uttar Pradesh, 97 per cent of districts are unlikely to meet the targets for both reducing deaths in newborns and in children under five irrespective of gender.

The reason for the disparities, according to the researchers, could be in the level of socio-economic development in terms of female literacy rate, urbanisation and safe drinking water. Disparities in the decrease in deaths in newborns vis-à-vis under 5-year-old children could be related to implementation of interventions.

"The state-level mortality rate does not reflect the inter-district variation in neonatal or under-five mortality rates. While some districts of a particular state may already have achieved the SDG3 target 15 years in advance, some districts will not achieve this even by the 2030 target time," Bora pointed out while speaking to India Science Wire.

Another finding is that female newborn deaths are lower than male newborn deaths, a much-expected finding due to female's biological advantage observed in other countries of the world. However, this advantage reduces in older children indicating potential discrimination against girl child.

India, presently, has the highest global share of deaths among the under-fives. Although the number of deaths in children below five years of age has gone done by almost 50 per cent in over 23 years, it is not enough to meet the required targets set by UN which aims at ending preventable deaths of newborns and other children under five years of age, reducing deaths of newborns and in under-five children, by 2030.

This is in spite of efforts to improve the infrastructure in backward districts through the National Rural Health Mission, Integrated Management of Neonatal and Childhood Illnesses, and other schemes. ■

(Courtesy: India Science Wire)

Yak suffer from high temperatures

DINESH C. SHARMA, New Delhi

The increasing trend of environmental temperature at high altitudes is resulting in heat stress in the Indian Himalayan Yak during warmer months of the year. This, in turn, is affecting the rhythms of physiological responses of the animal. Studies have shown that the average environmental temperature in the region has increased 1.5 per cent in the past 25 years, with yearly incremental increase of 0.06 degree.

Yak is accustomed to very cold temperatures and can survive up to minus 40 degrees but finds it difficult when the temperature crosses 13 degrees. "Yak can efficiently conserve its body heat during cold weather conditions and has minimal body mechanism to dissipate heat by way of sweating. This makes yak more susceptible to heat stress," explained Dr Vijay Paul, principal scientist at the ICAR-National Research Centre on Yak (NRCY), Dirang, while addressing a media workshop on climate adaptation organised jointly by the Indian Himalayas Climate Adaptation Programme, Department of Science and Technology, and Centre for Media Studies.

The animal alters its respiration rate not only in response to a changing need for oxygen but for regulating body temperature. Therefore, increased respiration acts as a predictor of heat stress, along with other symptoms like panting, reduced feed intake and higher intake of water. Noticing these indicators of heat stress, nomads have started own adaptation measures for their animals.

Climatic variables such as rainfall, cold waves and temperature change has been studied for the two yak rearing districts of Arunachal Pradesh – Tawang and West Kameng. Since past meteorological data is lacking in the region, researchers from NRCY have collated information from Brokpa nomads who are engaged in yak husbandry in Arunachal Pradesh. Two other prominent nomadic communities engaged in yak rearing are Changpas and Dokpas in Ladakh, Sikkim and Himachal Pradesh. The total yak population in six states in the Indian Himalayan Region is estimated to be over 76000. Globally, China – mainly Tibet region – has the highest numbers of yak.

"Yak rearing is an eco-friendly livelihood for nomads who migrate to higher altitudes during summer and return to lower altitudes at about 3000 metres above sea level during winters. This ensures that their animals remain in almost same ambient temperature all through the year. It helps minimise heat stress. This traditional migratory pattern is getting disturbed with changing weather patterns," noted Dr Paul.

Besides heat stress in animals, fluctuating temperature also affects growth and availability of fodder in alpine pasturelands. This, in turn, lowers productivity of the animals. Yaks

Photo: DS

Tough times for the yak.

provide nomads milk, fibre and meat. Milk production depends directly on the quantity and quality of forage in pasturelands. The long hair of yak have water-resistant properties and can be a good packing material. Nomads use yak hair to weave material for making tents. In addition to climate-related factors, there is a reduction in grazing areas and degradation of pasturelands due to various developmental activities as well.

Dr Paul said nomadic communities were taking several adaptive steps as duration and timing of migration was changing. There is proliferation of yak-cattle hybridization as well as diversification of herds. Yak rearing needs to be preserved as this is the only source of livelihood for nomads. This can be done by rejuvenating degraded pastures, improving livestock healthcare practices and providing feed supplements for yaks. "We also need to develop stains that are less sensitive to heat stress," he added. ■

(Courtesy: India Science Wire)

Dams affecting catchment of perennial rivers

P. SURAT, Faridabad

A recent study has found that unplanned developmental activities and land use are reducing the evergreen forest cover and perennial streams in the central region of Western Ghats in India. Indian researchers have mapped how large-scale activities have eroded the ecosystem in central Western Ghats, a biodiversity hotspot. The study focussed on Kali River that originates in Uttara Kannada District in Karnataka and joins the Arabian Sea. The river is as old as Western Ghats, has six major dams, 325 species of flora, and 190 species of fauna.

Using remote sensing data, the researchers found that between the years 1973 and 2016, the forest cover has reduced from 85 per cent to 55 per cent. In addition, land use pattern in the region has changed during the 1980-2000 period due to developmental projects such as dams built on the river Kali, Kaiga Nuclear Plant and Dandeli Paper Mill. The paper mill has led to large-scale conversion of forests to crops. Evergreen forests have shrunk from 62 per cent to 38.5 per cent during the period, the study notes.

Around 2309 million cubic meters of water are required for the demands of society and livestock in the region, while around 4700 million cubic meters is required to maintain ecosystems and aquatic life. Analysis showed that although Kali River has sufficient water supply and perennial streams in the Ghats and coastal area, regions that lie in plain lands with higher degree of agriculture and cultivation have intermittent and seasonal flow that has led to water scarcity for four to nine months in a year.

Siad T.V. Ramachandra, scientist at the Indian Institute of Science and a member of research team, "Villagers in the vicinity of native forests earn Rs1.54 lakh per acre per year compared to Rs 32000 in villages with stream catchments experiencing deforestation. This confirms vital role of native forests in sustaining water and people's livelihood." ■

(Courtesy: India Science Wire)