



## MESSAGES



**डॉ. मेहेन्द्र शर्मा**  
सचिव

आदरणीय शिक्षाविद / वैज्ञानिक वर्ग / विद्यार्थी सर्व प्रथम आप सभी को इस देश की तरक्की में अनुसंधान, विकास, नवाचार, उद्यमिता के लिए आत्मनिर्भर भारत, मेक इन इण्डिया, स्टार्टअप जैसी योजनाओं का स्वदेशी साकार रूप देने के लिए साधुवाद एवं बधाई।

जैसा कि आप सभी को विदित है कि विज्ञान (विज्ञान) भारतीय स्वदेशी विज्ञान आन्दोलन के रूप में एक नॉन प्रॉफिट स्वयंसेवी संगठन है।

आज विज्ञान भारती न केवल भारत में बल्कि अन्य देशों में भी भारतीय वैज्ञानिक परम्परा को आधुनिक विज्ञान के साथ समिश्र करते हुए वैदिक विज्ञान की तार्किकता एवं प्रमाणिकता को विश्व पटल पर वैज्ञानिक बिरादरी में मंथन का प्रयास कर रही है।

विज्ञान भारती देश में अनुसंधान की संस्कृति व आत्मनिर्भर भारत के लिए उद्योग एवं शिक्षाविदों के मध्य इंटरफेस का कार्य कर रही है। विज्ञान भारती राष्ट्रीय शिक्षा नीति 2020 को लेकर भी सजग है जिसमें विज्ञान सहित सभी विषयों के लिए सरकारी एजेंसियों और इन्डस्ट्री के बीच तालमेल और निकट सहयोग स्थापित किया जाएगा। इससे अनुसंधान व स्वदेशी को प्रोत्साहन मिलेगा, उदीयमान वैज्ञानिकों और विद्वानों को अपनी क्षमता के विकास और सदुपयोग के अवसर मिलेंगे।

देश की बौद्धिक, सामाजिक और आर्थिक प्रगति तथा नागरिकों के कल्याण के लिए नए ज्ञान के सृजन और प्राप्ति से अधिक महत्वपूर्ण और कुछ नहीं है। स्वदेशी की भावना में सफलता भारत की प्रगति का सूत्र बनेगी। ज्ञान, प्रगति व अनुसंधान के लिए कोई सीमाएँ नहीं होती।

विज्ञान भारती राष्ट्रीय शिक्षा नीति 2020 (NSP-20) व विज्ञान, प्रौद्योगिकी, नवाचार नीति 2020 (STIP-20) के माध्यम से देश में शिक्षा क्षेत्र की संभावना व अनुसंधान, नवाचार व स्टार्टअप के क्षेत्र में ढांचागत व्यवस्था एवं एकीकृत (समग्र) विकास के लिए सेतु का कार्य करने के लिए संकल्पित है।

इस पहल को समझकर इसमें भागीदार बनने के लिए सबका सहयोग व संकल्प जरूरी है, इसी परिप्रेक्ष्य में विज्ञान भारती संस्थान द्वारा तकनीकी व अनुसंधान संस्थानों एवं विश्वविद्यालय व महाविद्यालयों में होने वाले नवाचार, बौद्धिक सम्पदा अधिकारों के अन्तर्गत वादों तथा उद्यमिता विकास, आदि विविध विषयों पर अन्तर्विषयी आलेखों के माध्यम से विभिन्न संस्थानों में सहयोग एवं साझा योजनाएँ बने इसी उद्देश्य को लेकर "ई-न्यूजलैटर", विज्ञान भारती राजस्थान जारी करने का निर्णय लिया है जो कि राष्ट्रीय स्तर पर राज्य के नवाचारों को प्रसंज्ञान में लाने के साथ मंच प्रदान करेगा। स्थापना दिवस पर जारी प्रथम न्यूजलैटर राष्ट्र के आत्मनिर्भरता की ओर बढ़ते कदम के लिए संकल्पित है।



**श्री कलराज मिश्र**  
राज्यपाल  
राजस्थान

विज्ञान भारती जो कि स्वदेशी भावना का एक विज्ञान आन्दोलन है, विश्वपटल पर भारत का विज्ञान के क्षेत्र में योगदान को परिलक्षित करने में प्रयासरत हैं। एक कल्याणकारी राष्ट्र के रूप में उत्कर्ष होने के लिए हमारा राष्ट्र अनेक चुनौतियों का सामना कर रहा है। इन चुनौतियों की विशिष्ट प्रकृति को देखते हुए, भारतीय सांस्कृतिक विरासत से सामंजस्य रखते हुए विज्ञान और प्रौद्योगिकी के क्षेत्र में तेजी से प्रगति हो तब ही इन चुनौतियों का सामना किया जा सकता है। विज्ञान भारती राजस्थान द्वारा इस दिशा में e न्यूज लैटर का प्रकाशन सराहनीय कार्य है।



**श्री जयंत सहस्रबुद्धे**  
राष्ट्रीय संगठन सचिव  
विज्ञान भारती

मेरा विश्वास है कि अगले पांच सालों में अनुसंधान एवं विकास से जुड़े संस्थानों के नवाचारों को विज्ञान भारती राजस्थान e न्यूज लैटर एक मंच प्रदान करने में महत्वपूर्ण योगदान देने का कार्य करेगा।



**प्रो. आशुतोष शर्मा**  
सचिव, भारत सरकार  
विज्ञान प्रौद्योगिकी विभाग  
भारत

वैज्ञानिक चिंतन और शोध में जन सामान्य से जुड़े विषयों को प्रमुखता देने व वैज्ञानिक शोधकार्यों के प्रस्तुति करण, जागरूकता संदेशों एवं नवाचारों द्वारा शिक्षण व लेखन को बढ़ावा देने के उद्देश्य से प्रारंभ किया जा रहा विज्ञान भारती राजस्थान e न्यूज लैटर निश्चित ही उपयोगी साबित होगा जो समाज के हर वर्ग को नवोन्मेष के लिए प्रेरित करने का प्रयास करेगा ऐसा मेरा विश्वास है।



**Dr. Shekhar C. Mande**  
Secretary to Govt of India,  
DSIR and Director General,  
Council of Scientific & Industrial Research [CSIR]

I extend my heartiest greetings to the Vigyan Bharati, Rajasthan for publishing their first newsletter covering all the current and future activities of the state. I am happy to learn that the newsletter will also publish the articles, covering the importance of both modern as well as ancient science. Wide spreading of scientific and technical achievements of Indian science would help to encourage our young generation towards science. As CSIR always tries to contribute in the area of solving various societal problems such as hygienic food, clean energy, affordable healthcare, precision agriculture, similarly I hope, the newsletter will focus to discuss the day-to-day challenges of our country. I once again compliment all the people, who are closely associated with onerous task of publishing the newsletter. I wish the Vigyan Bharati Rajasthan all success in the future endeavours.



**Prof Udaykumar R Yarangatti**  
Director MNIT,  
JAIPUR

The e-News letter of VIBHA Rajasthan is an integral part of India's long term vision in developing and widening the spectrum of scientific temper for sustainable development and new technological innovations in India & abroad. It aims to build a strategy for rural India through the advancement of science and technology. Moreover, it also provides a platform to young students, scientists & technocrats across India for exchange of knowledge and ideas and also supporting flagship schemes like "Atma Nirbhar Bharat" "Make in India", "Digital India", "Unnat Bharat Abhiyan" etc. I appreciate the collaborative efforts of Vigyan Bharati and R&D institutions.

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## PARICHAY

### VIJNANA BHARATI

India faces critical challenges as a nation in its march towards a welfare state. Considering the nature of the challenges which are so unique, only rapid strides in the sector of science and technology, in resonance with India's heritage can meet those challenges. In this context Vijnana Bharati, a science movement with Swadeshi spirit has a greater role to play. Swadeshi Science Movement was started in Indian Institute of Science (Bengaluru) by a few eminent scientists under the guidance of Prof. K I Vasu. This movement gradually gained momentum and emerged as Vijnana Bharati in 1991. Vijnana Bharati is popularly known as Vigyan Bharati (ViBha)

The foundation principle of VIBHA is made mainly -

- As a vibrant movement for the development of Swadeshi Sciences
- As a dynamic Science Movement with a Swadeshi Spirit, interlinking traditional and modern sciences on the one hand, and natural and spiritual sciences on the other hand
- As a Swadeshi Movement with modern sciences adapted to national needs

### VIGYAN BHARATI RAJASTHAN

Vigyan Bharati Rajasthan (also known as VIBHA Rajasthan) is a state chapter of Vijnana Bharati, under its central zone. The journey of VIBHA Jaipur prant started in 2002 when it got registered with Registrar of Cooperative Societies, Rajasthan. It has more than 400 active members comprising of senior faculties of eminent education institutes, Teachers, Scientists, Engineers, technocrats, Doctors, Entrepreneurs, Science Communicators, Social activists, students, senior officers of State and Central Governments etc from all over Rajasthan, who voluntarily work for the noble cause of Nation building through Science & Technology. ViBha Rajasthan has been organizing various activities along with active participation in national programmes like India International Science festival (IISF), Vidyarthi Vigyan Manthan (VVM), Bhartiya Vigyan Sammelan (BVS) etc. to fulfill the aim of Vijnana Bharati. Some glimpses of past programmes are given in this inaugural issue.

### MoU with Eminent Institution:

Vibha Rajasthan has signed MoUs with several institutes to boost the science and technology in the state. Few of them are Mody University, MNIT Jaipur, CSIR-CEERI, Pilani



**Mody University of Science and Technology-** An MoU was signed between Dr. Meghendra Sharma (Secretary, Vibha, Rajasthan) and Dr. Vinod Purohit, Registrar, Mody University, Lakshmgarh on Oct 30, 2018 in the presence of Sh Shailesh Jain, Prof N K Gupta, Dr Umesh Gupta, Dr Keshav Lal Ameta and other senior faculties of Mody University.



An MoU was signed between Dr Meghendra Sharma, Secretary, ViBha Rajasthan and Dr P C Panchariya, Director, CEERI- Pilani on 5th September 2020 at CEERI Jaipur campus in auspicious presence of Dr Udaykumar, Director, MNIT Jaipur, Dr Laxman Singh Rathore Ex DG, IMD, Govt of India, Dr Ashwani Sharma, Pro VC, Sh Shailesh Jain, Dr Sai Krishna.



An MoU was executed on 21st September 2020 at MNIT Jaipur, between Vigyan Bharati Rajasthan and MNIT Jaipur for joining hands and mutual support in Mai Bhi Banunga Kalam (MBBK) and Vigyan Chetna Yatra programs. In the brief ceremony, Dr. Meghendra Sharma, Secretary, signed on behalf of Vigyan Bharati Rajasthan and Prof. Udaykumar R Yargatti, Director on behalf of MNIT Jaipur.

MoU was executed in auspicious presence of Prof B L Swami, Prof K R Niazi, Prof Y P Mathur, Associate Prof Pawan Kalla, from MNIT Jaipur and Mr. Shailesh Jain Joint Secretary, Vigyan Bharati Rajasthan.

### e-Paricharcha (Webinar Series)

During COVID-19 Pandemic Vibha Rajasthan initiated e-Paricharcha in the form of webinars with the objective to develop an action agenda for different sectors by creating education and awareness to encourage indigenous approach towards scientific innovations. The core theme of webinars was "Scientific Innovations for Import Substitution and Economic Growth of India".



**1<sup>st</sup> Webinar :** May 24-25, 2020 on "Innovation and Entrepreneurship for economically independent Bharat" and "Innovation for affordable healthcare infrastructure in rural Bharat " on first and second day, respectively. There were more than 500 participants on both the days.




**2<sup>nd</sup> Webinar:** World Environment Day i.e. June 5, 2020. on "Agriculture, environment and Natural Resource Management: Lesson from the Pandemic". Vice Chancellors from agriculture Universities, ICAR officials and other academicians attended the event. Sh. Gajendra Singh Shekhawat, Hon'ble Minister, Jalshakti inaugurated the webinar. Dr. N.K. Gupta moderated it.

**3<sup>rd</sup> Webinar-17<sup>th</sup> June 2020:** Combating exigencies due to COVID19 Waste at common biological waste management facilities in association with international waste management ( IIWM) and Rajasthan Pollution Control Board (RPCB). Shri PK Goyal IAS , chairman Rajasthan Pollution Control Board inaugurated the training program. Dr. Vijay Singhal , member secretary of RPCB chaired the panel discussion. Pollution control board regional officers and representatives from health department attended the webinar.

**A Webinar on**  
**Traditional knowledge and skills of Indian Food Cooking for Healthy life**

19th June, 2020 | Friday  
 3:00 pm to 4:30 pm

**Keynote Speaker**  
**Dr. Pramila Sanjaya**  
 Hon' Advisor of SIDART NGO,  
 Former State Programme Manager and  
 National Advisor at CARE, India



**4th Webinar :** 19th June, 2020 - Traditional Knowledge and Skills of Indian Food Cooking for Healthy Life”, in association with SS Jain Girls' PG College in collaboration with SHAKTI, Rajasthan was organized. Keynote speech was delivered by Dr Pramila Sanjaya

**A Webinar on**  
**Yogic Management for Menstrual Disorders**

21<sup>st</sup> June, 2020 | Sunday  
 11:00 AM to 12:00 PM

**INVITED EXPERTS:**

**Yoga Expert**  
**Dr. Vandana Singh**  
 Hon. Professor  
 IIS Indore (Hons.)

**Gynaecologist**  
**Dr. Noopur Prasad**  
 Hon. Advisor of SHAKTI,  
 Jaipur

**Diet Expert**  
**Dr. Pramila Sanjaya**  
 National Advisor at CARE, India

**FREE**  
 Registration

**5th Webinar :** 21 June 2020- International Yog Divas: Yogic Management for Menstrual Disorders, in association with S.S. Jain Subodh Girls P. G. College, Sanganer, Jaipur under the banner of IQAC and in collaboration with SHAKTI, Rajasthan. Experts were Dr Vandana Singh, Dr Noopur Prasad and Dr Pramila Sanjay



**6th Webinar:** 6th September 2020- consultation session Science, Technology & Innovation Policy 2020 of India (STIP2020). A consultation session in a webinar was held on 6th September 2020 (Sunday) to discuss formulation of upcoming STIP 2020. Dr Meghendra Sharma Secretary Vigyan Bharati Rajasthan welcomed all. Dr Akhilesh Gupta, Head SPLICE DST Govt of India presented an overview. Inaugural address was delivered by Shri Jayant Sahasrabudhe. Professor Ashwini Kumar Sharma delivered a keynote address. During the panel discussion Professor Bhagwati Prakash Sharma Vice Chancellor GB University, Professor RL Raina Vice Chancellor JKLU, Prof. Udaykumar R Yaragatti, Director MNIT Jaipur, Dr Laxman Singh Rathore, Ex DG, IMD also expressed their views. Eminent scientists and persons from Rajasthan participated and gave important inputs. Dr Umesh Gupta, Asso. Prof, JKLU moderated and Shri Shailesh Jain, Jt. Secy, delivered vote of thanks to all.



**7th Webinar :** 15<sup>th</sup> September 2020 - National Engineers day-Way forward for self sustainable Bharat using Science & Technology Prof Uday Kumar R Yaragatti, Director MNIT JAIPUR made inaugural address, Key note address by Dr Ashwini Kumar Sharma, Former Director General, NIELIT, MeitY, Bharat Sarkar & Ex MD, RajCOMP, Rajasthan Sarkar delivered Keynote address, Invited Talk by Dr P C Panchariya, Director, CSIR-CEERI, Pilani, Concluding Remarks and Vote of thanks by Dr. L.S. Rathore, President ViBha Rajasthan, Ex DG, IMD, Govt of India Program was coordinated by Sh. Shailesh Jain

**VIGYAN BHARATI RAJASTHAN**  
**e-Paricharcha**  
 A Webinar Series on  
**Scientific Innovations for Import Substitution and Economic Growth of Bharat**

Sept 15, 2020  
 Tuesday  
 3 PM to 5 PM

**Way forward for self sustainable Bharat using Science & Technology**

**53<sup>rd</sup> National Engineers' Day**  
 15 Sept 2020

**Invited Experts:**

**Inaugural Talk:** Prof. Udaykumar R Yaragatti, Director MNIT JAIPUR

**Keynote Speaker:** Prof. Ashwini K. Sharma, Ex-Chancellor, Rajasthan University

**Invited Talk:** Dr P C Panchariya, Director, CSIR-CEERI, PILANI

**Vote of Thanks:** Dr. L.S. Rathore, President, ViBha Rajasthan

Join with Google Meet: <https://meet.google.com/ghn-ghn-ghn> Date: 15-09-2020 Time: 3 PM - 5 PM

**Rashtriya Hindi Vigyan Sammelan (RHVS)**

The third Rashtriya Hindi Vigyan Sammelan (RHVS) with main theme as “Role of Science and Technology in sustainable development” was organized Dec 16-17, 2016 at Rajasthan University, Jaipur. The congress was inaugurated by Sh. Kali Charan Saraf, then Hon'ble Minister for Medical & Health, Govt of Rajasthan, Jaipur. Smt. Kiran Maheshwari, then Hon'ble Minister for Higher Education, Govt of Rajasthan and Dr. B. L. Chaudhary, then President, Board of Secondary Education, Ajmer were the Special Guests. The organizing team included Dr. Nagawat, then Dean, Science Faculty; Dr. Deepak Bhatnagar, then Director, CCT, Rajasthan University, Jaipur and Dr. Meghendra Sharma, Secretary, Vigyan Bharati Rajasthan. In total, about 300 research papers were delivered. The participants were from different universities of Rajasthan as well as other states. The medium of congress was Hindi.





A state level workshop on “Role of Empowered Women in Making of New Rajasthan” was organized by Vibha-SHAKTI in collaboration with Rajasthan Rajya Mahila Ayog at IGPRS, Jaipur on Oct12, 2017. More than 100 women Sarpanches and Upsarpanches participated. The event was chaired by Smt. Suman Sharma, then Chairperson, Rajasthan Rajya Mahila Ayog and Smt. Diya Kumari, Hon.MLA.



A two day National Conference on “Recent Trends and Advances in Environmental Issues, Awareness and Health-2017” was organized at JECRC University, Jaipur during Nov 17-18, 2017. The event was supported by Department of Science and Technology, Rajasthan. More than 400 delegates from different parts of the country participated. In total 37 oral and 158 poster presentations were made by eminent researchers.



A one day National Workshop on “Environmental Awareness Problems and their Solutions” was organized on Jan 20, 2018 at SS Jain Subodh Girls College, Sanganer, Jaipur in association with DST, Rajasthan & Rajasthan State Pollution Control Board. Prof. Manoj Patariya, Director-NISCAIR was the keynote speaker. The programme was chaired by Prof. Ashwani Kumar in inaugural ceremony and Prof. P.C. Trivedi in valedictory session. Prof. R.K. Kothari, then Vice Chancellor, University of Rajasthan was chief guest in inaugural function and Prof. Y.R. Yaragatti, Director, MNIT, Jaipur in valedictory function.



### Workshop on Satellite communication and water rocketry

Vigyan Bharati Rajasthan also undertakes Workshops and trainings for young students. Many workshops have been organized on Satellite Communication, Water Rocketry, Electronic model making.



### Parishkar College of Global Excellence, Jaipur

Nov 20-21 2018 - Two days workshop was organized for students on satellite communication



### Subodh Public School, Sanganer

September 9<sup>th</sup>, 2019 - Space Communication and water rocketry workshop was organized in association with Space Development Nexus(SDNx)



### Maxfort School, Partapura (Banswara)

February 22-23, 2020 - Two days' workshop was organized at Partapura (Banswara), a distant and tribal area. Workshop theme was Drone Technology, Robotics and Hydro rocketry.



### Workshop on Project Proposal Writing

Workshop was held in Parishkar College of Global Excellence, Jaipur. Dr Sunil Chaturvedi from Vibhawari, Bhopal conducted 2 days training.

### Exhibitions

Model exhibitions and poster exhibitions are regular part of activities by ViBha Rajasthan. Such exhibitions are being organized side by side during some event like NSD, VVM or conferences.



### National Science Day (NSD)

National Science Day of India is observed on 28th February every year to commemorate the achievements of Nobel laureate Prof CV Raman. The event is being organized in with different themes in different institutes of Rajasthan to involve the mass of different taste and locality.

In 2017, NSD was organized at JK Lakshmi Pat University on Feb 28, 2017 on the theme "Science and Technology for Specially Abled People". The event was attended by students, faculty, NGOs, social workers etc. It also witnessed the presence of Dr.R.L. Raina, Hon'ble Vice Chancellor, Dr. Anupam K Singh, Director IET, Dr. Pooja Mukul, Technical Director, Paul Hamlyn International Centre for Prosthetics & Orthotics, BMVSS, Jaipur, Dr. Amitabh Dube, Sr. Professor (Physiology), SMS Medical College, Jaipur and Sh. Madhusudan Bohra, Vigyan Bharati, Rajasthan.



In 2018, NSD was organized at MNIT, Jaipur during Feb 26-28, 2018. The theme was "Science and Technology for Well being". It was a mega event where approximately 3000 students from various sectors were participated. Govt schools, private schools, degree colleges, technical colleges were among the active participants.

In this NSD, Vibha fulfilled its objectives for better tomorrow through its activities like Science exhibitions, smart village activities, Science Teacher Workshop, Workshop on NBO, Workshop on agriculture and IT.

Dr. G. Satheesh Reddy, then Advisor to Defense Minister, Gol delivered the Vibha Silver Jubilee lecture on Space Technology and current research in the field of defense.



In 2020, NSD was organized in Pt DD Upadhyay Agriculture College, Deoli on March 01, 2020. There were more than 300 participants including students and local persons. Prof. J.S. Sandhu, Vice Chancellor, SKN Agriculture University was the chief guest. Dr. N.K. Gupta, SKN Agriculture University delivered the key note address. Dr. Meghendra Sharma, narrated about the activities of Vigyan Bharati. The students of the college also arranged a gallery including model and ideas of start up in agriculture. Sh. Dinesh Agrawal and Dr. N.S. Yadav were present from organizer side.

### Vdyarthi Vigyan Manthan (VVM)- A National Programme

ViBha Rajasthan is actively involved in VVM programme to search the talent from various parts of the state. The efforts are being made to enhance the participants and involvement of more schools every year.



In 2017, a state level camp was organized in Rukmani Birla Modern High School, Jaipur on Feb 26, 2017 wherein 101 students from 56 schools from various parts of Rajasthan participated. Among these, 12 students were selected for the national level camp.



In 2018, State Level camp was organized in SS Jain Subodh College, Sangarner on Feb 25, 2018. This year 83 students from 70 schools participated from various parts of Rajasthan. Out of these 12 students were selected for the national level camp.

In year 2019, held on January 20, 2019 at Parishkar College of Global Excellence, Jaipur. A total of 135 students were selected from 28 out of which 106 students from 28 schools appeared in the State Level Camp.



In 2020 This year VVM-SLC was held on January 19, 2020 at Cambridge Court School, Jaipur. A total of 122 students were selected from 32 schools throughout Rajasthan out of which 97 students appeared in the State Level Camp.



**Student Engineering Model competition (SEMC) - India International Science Festival(IISF)**

ViBha Rajasthan has played keyrole in organizing National level Student Engineering Model competition (SEMC) during India International Science Festival (IISF) consecutively two years in 2018 and 2019 held at Lucknow and Kolkata respectively. Dr Meghendra Sharma as National Convener of this IISF event , made it a significant and independent event of IISF.

ViBha Rajasthan supported organization of Student Engineering Model Competition (SEMC) at IICB, Kolkata during IISF 2019, Dr Meghendra Sharma as its National Coordinator team. In total, 100 projects/196 engg. students were selected through the 64 online jury. The SEMC programme was inaugurated by Hon S&T Minister, Dr Harshvardhan Ji.



**World Environment Day Celebrations(05 June)**

Vibha Rajasthan has concern with global climate change issues and encourages awareness and action to protect our environment. Every year we celebrate World Environment Day on 5th June in the form of discussion, seminar,rally etc.



On June5, 2017, Vibha Rajasthan celebrated the WED at Amar Jawan Jyoti, Jaipur. The theme was “ Aao Juden Prakariti Se”. A cycle ride was also organised on this day with a message of“ Your Free Health Insurance”. Around 300 cyclists were flagged off by then Hon'ble Mayer Sh. Ashok Lahoti & Hon'ble MP Sh Ram Charan Bohra along with other dignitaries. On this occasion, innovatively designed bird feeder “Akshay Dana Patra” using waste water bottles were distributed at mass level.



World Environment Day was celebrated on 5<sup>th</sup> June 2017 at Pathey Kan Bhawan, Jaipur. Main theme was on Food waste disposal Innovation Techniques.



Unveiling of Poster on WAVE Summit

## Oil Adulteration in India: An emerging danger to the human health

**Navjot Kumar**

*Scientist, CSIR-CEERI, IIT, Jaipur Centre, Jaipur*

Apart from milk or milk products, vegetable oils and fats play an important role in our daily diet as cooking/frying oils, salad oils and numerous other food product preparations. Apart from its nutritional values, it possesses great importance from economical point of view as well. In India vegetable oils consumption roughly stands at 20-25 million tons, out of which only 6-8 million tones come from local production and rest is imported from other countries. Due these high demands in national and international market, adulteration of pure edible oils with cheaper oils has become a common practice these days. Consumption of these adulterated oils & fats on a regular basis may result into severe health problems such as loss of eye sight, liver damage, heart problem etc. Mustard oil is usually adulterated with argemone oil and butter yellow and may lead to gall bladder cancer, epidemic dropsy, glaucoma and loss of eyesight. Edible oils adulteration with minerals oils have been reported several times and may cause serious damage to the liver or cancer. Karanja and caster are reported as potential adulterants to the edible oils and may result into heart problems, liver damage, indigestion, ulcer, throat irritation etc. Extra virgin olive oil or pomace olive oil comes with very high price, hence often substituted with lower cost alternatives which may cause certain food related allergies.

CSIR-CEERI, Jaipur Center is having **Nuclear Magnetic Resonance (NMR) Spectroscopy**, which is one of the premier spectroscopic techniques available for molecular structure identification. Information such as absorption frequency vs intensity is rapidly available, when an analyte is placed in a magnetic field and is subjected to radio frequency. Using NMR spectroscopy and UV-VIS-NIR spectroscopy various adulterated and pure oil samples are tested and evaluated.

Total 1,015 samples were collected from 15 different states having 8 different varieties namely Soyabean, Mustard, Coconut, Sesame, Palmolein, Sunflower, Groundnut and Cottonseed and the results are shown in the table below. The purity of the edible oils can be ascertained using several chemical & physical parameters such as refractive index, specific gravity, saponification value, iodine value, acid value etc. Therefore, there is a strong need of fast, easy to use, less expensive and yet accurate measurement technique for authentication of pure oils & fats in the country.

Edible Oils	Total	Failed	% Failure
Coconut Oil	149	126	84.56%
Cottonseed Oil	54	40	74.07%
Sesame Oil	50	37	71.77%
Mustard Oil	124	89	71.77%
Groundnut	152	90	59.21%
Palmolein	50	16	32%
Soyabean	230	46	20%
Sunflower	206	34	16.5%
	<b>1,015</b>	<b>478</b>	<b>47.09%</b>

Source: Consumer voice magazine, 2016.

## BIOTECHNOLOGY FOR ENERGY, FOOD, HEALTH CARE, SANITATION: CURRENT AND FUTURE CHALLENGES

**Ashwani Kumar**

*Alexander von Humboldt Fellow (Germany) Former Head and Director Life Sciences, Department of Botany, University of Rajasthan, Jaipur 302004.*

The United Nations (UN) marked its 75th anniversary in September 2020 and Nobel for Medicine went to Hepatitis C and Nobel for Chemistry went for Genetic engineering both emanating from basic biotechnology over the last decades. The **Nobel Peace Prize 2020** was awarded to World Food Programme (WFP) "for its efforts to combat hunger, for its contribution to bettering conditions for **peace** in conflict-affected areas and for acting as a driving force in efforts to prevent the use of hunger as a weapon of war and conflict." The provision of safe water, sanitation and hygienic conditions is essential to protect human health during all infectious disease outbreaks, including the COVID-19. Global warming caused largely due to anthropogenic factors has warranted reduction in fossil fuel consumption and its replacement by renewable sources of energy. Genetic engineering and synthetic biology along with nanotechnology and bioinformatics are tools for the progress of mankind and its survival.

In modern times physics, chemistry, botany, zoology, medical and agricultural science have all merged into one science that is science of biotechnology conveniently defined as application of biology and techniques to obtain some products for human welfare. BT cotton has saved millions of lives due to reduction in direct and indirect use of pesticides. Fortification of rice with vitamin A or developing resistant variety in agriculture are some of the examples of success of science of biotechnology.

Medical biotechnology has helped in understanding about acute respiratory syndrome caused due to coronavirus 2 (SARS-CoV-2). Cure of virus disease and or development of vaccine are all based in biotechnological innovations. Science has to lead over politics and administration and biotechnology is the only way to feed billions of growing population by developing improved varieties. The tools and approaches for better water and sanitation planning and progress are to be found in understanding microbiological processes and making use of them in biodegradation by heterologous expression in microbial systems.

Validation of ancient medical and agricultural practices through biotechnology strengthens the belief in traditional methods and beliefs. Vigyan Bharati is a step in this direction to find understanding, explanations and application of ancient methods and sciences in the light of modern discoveries for health and social welfare. I congratulate this effort.

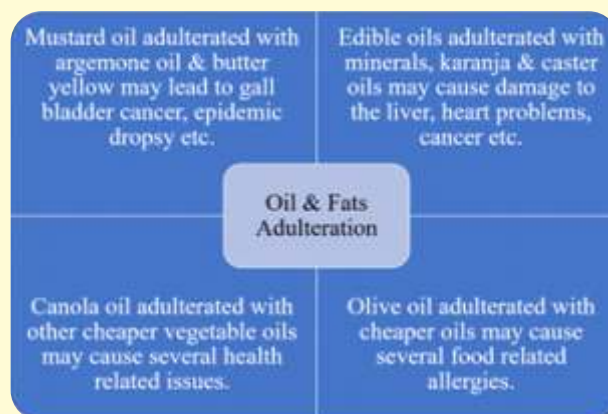


Figure. Adulteration in edible Oils & fats

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