



99th INDIAN SCIENCE CONGRESS

January 3-7, 2012, KIIT University
BHUBANESWAR

5th Vigyan Sancharak Sammelan

(Science Communicator's Meet)

January 4-6, 2012

Theme

**SCIENCE AND TECHNOLOGY FOR INCLUSIVE
INNOVATION: ROLE OF WOMEN**

Programme & Abstract

Co-ordinated by

Dr. Geeta Satpathy

Associate Dean, School of Humanities

Supported by

Department of Science & Technology (DST)

New Delhi

AMRAVATI

1. Jakate Prasanna Hemant
Reporter,
Sakaal Media Group
Regional office, Khaparde Bagicha,
Near Railway Station,
Amravati
Email: prasannajh@gmail.com
Cell. +919850316720

BANGALORE

2. Dr.Narsegowda,
Head,
Department of Biotechnology.
Visweshwarapura College,
K.R.Road,
Bangalore.560004
3. Prof. H.R.Jayamma.
Department of Education.
Bangalore University.
Jnana Bharati,
Bangalore.560056.

BHOPAL

4. Dr.Charanjeet Kaur
Professor & Head
Department of Chemistry
Sri Satya Sai College for Women
Bhopal.

Bhubaneswar

5. Prof. Kamalakanta Jena
Department of Physics
Govt.Women's College

5th Vigyan Sancharak Sammalen

Sundergarh-770001,Odisha

E-mail:kkjena@gmail.com

6.Mr.Nikunja Bihari Sahu

Education Officer

Regional Science Centre

J N Marg

Bhubaneswar.

Email-nikunja_sahu@rediffmail.com

CHENNAI

7. Dr. S.Thiyagarajan
Head,Dept. of Microbiology
Asan Memorial College of Arts and Science
No.2/54,Main Road,Astalakshmi Avenue
Pallikaranai,Chennai-600100

8. Dr.I. Arul Aram
Associate Professor
Department of Media Science
Anna University,Chennai-600025

DELHI

9. Dr. Mrs. Jyotsna Sharma
PGT Biotechnology,
Delhi Public School
Ghaziabad, Vasundhara
New Delhi
Email-Jyotsna_nrcpb@yahoo.com
10. Ms.Anju Kulshrestha
Head,
Department of Physics
Springdales School,
Benito Juarez Marg

5th Vigyan Sancharak Sammalen

Dhaulakuan,
New-Delhi.
Email-kulashrestha_anju@rediffmail.com

JAIPUR

11. Sachin Sharma
Territory Business Manager
Religare SRL,Jaipur
Email: s.sharma97@yahoomail.com

KANPUR

12. Mr.Pramod Kumar Misra
Visiting Faculty STEP
HBIT,Kanpur.
Email: vijaykanpur@rediffmail.com
13. Dr.Abhaya Kumar Srivastava
Department of Military Science
D.A.V.College,
Kanpur
Email: vijaykanpur@rediffmail.com

KOLKATA

14. Payel Chakrabarti
C/o- HP Chakrabarti
Biroja,105,
Sukanta Place,South Baksara
Po-Baksara-711110,Howrah,W.B
Email: payel12285@gmail.com
15. Samrat Dev
F/J,12 Jyabagra Battala
Baguiati,
Kolkata-700059
Email: samrat30@rediffmail.com

NAGPUR

16. Dr.Pradeep P. Kundal
Professor & Head,Department of Geology
Rashtrasant Tukadoji Maharaj Nagpur University
Law College Square,Nagpur-440001
Email: ppk_kundal@rediffmail.com
- 17.Ms. Madhuri Tarachand Thakre
Department of Botany
Rashtrasant Tukadoji Maharaj Nagpur University
Nagpur-4400033
Email: madhu_swt10@rediffmail.com

PATIALA

18. Prof.(Dr.) Aruna Bhatia
Department of Biotechnology
Punjabi University,
Patiala
Punjab.

SAGAR

19. Mr.Manish Kumar Jain
Lecture,Department of Biotechnology
Dr.H.S.Gour University,Sagar-470003
Email: manish_jainjbdm@yahoo.co.in
20. Dr.Meeta Mishra
Lecture,Department of Zoology
Dr.H.S.Gour University,Sagar-470003
Email: meeta239@gmail.com

OTHER INVITEES

21. P. Jayashankar,
Director (Acting),

5th Vigyan Sancharak Sammalen

Principal Scientist & Head
Fish Genetics & Biotechnology Division
Central Institute of Freshwater & Aquaculture (CIFA)
Kausalyaganga
Bhubaneswar.

22. Dr. Monoj Patairiya
Director(Scientist 'F')
NCSTC
Dept. of Science and Technology, Govt. of India.
Email: monojpatairiya@yahoo.com
23. Dr. Bijay Kumar Nanda
International Observer,
World Bank (Forest Investment programme)
Hon. Executive Director
Sadhana Foundation
Bhubaneswar
24. Dr. Jaykrushna Panigrahi
Convener, ISCA Chapter
Bhubaneswar, Odisha
25. Prof. (Dr.) Chittaranjan Das
Chairman
State Environment Impact Assessment Authority, Orissa,
42 Surya Nagar. Bhubaneswar. 751003
Odissa
- i) Staff and faculty members of School of Humanities and Social Sciences
- ii) Staff and faculty members of School of Languages

5th Vigyan Sancharak Sammelan (VSS)
(Science Communicator's Meet)
January 4-5, 2012

Theme
Science and Technology for Inclusive Innovation
Role of Women

PROGRAMME

Venue
HALL-5, CAMPUS-6,
KIIT UNIVERSITY

INAUGURAL PROGRAMME

5th Science Communicator's Meet

4 - 5 Jan. 2012, Hall-5 ,Campus-6: KIIT University, Bhubaneswar

INAUGURAL SESSION: Day 1: 4 Jan'12,Wednesday: 2.00-3.00pm

2.00-2.05	Welcome Address	Dr(Mrs)Vijay Laxmi Saxena General Secretary (Scientific Activities) ISCA
2.05-2.10	Objective of the Programme	Dr. Geeta Satpathy Asso. Dean, School of Humanities KIIT University
2.10-2.20	Special Address	Dr. B.P.Singh, Head, NCSTC, Department of Science &Technology, Govt. of India
2.20-2.35	Inauguration by Chief Guest	Prof. D. Balasubramanian Director,Research Division LVPEI,Hyderabad
2.35-2.40		Release of Abstract Booklet
2.40-2.45	Presentation of	Dr.B.C.Deb Memorial Award Mr. Irfan Human,Editor, Science Times News Views
2.45-3.55	Speech By Guest of Honour	Sri Surya Narayan Patra Minister of Revenue & Disaster Management, Information and Public Relation
2.55-3.05	Presidential Address	Dr.Geeta Bali General President, ISCA,99

5th Vigyan Sancharak Sammalen

3.05-3.10 Vote of Thanks Dr.Manoj Chakraborty
Gen.Secy.(Membership Affairs),ISCA

3.10-3.20 **TEA**

TECHNICAL SESSION I: Day 1: 4 Jan'12:Wednesday:3.15- 4.00pm
THEME: Science and Technology for Inclusive Innovation:
Role of Women

3.15-3.20 Welcome Address by Dr.Bijay Kumar Nanda
Session Chairperson International Observer, World Bank,
(Forest Investment Programme)

3.20-3.30 Invited Lecture Dr.Manoj Patairiya
Director(Scientist F)
NCSTC,Dept.of Science and Technology,
Govt.of India

3.30-3.40 The effort for the Mr. Irfan Human
Development of Editor,
Scientific approach Science times News & Views
in India by science 67-Anta,Railway field
popularization: Shahjahanpur,U.P.
A case study (B.C.Deb Memorial Awardee)

3.40-3.50 Calcareous Algae from Dr. Pradeep P.Kundal
Indian Sedimentary Prof. & Head, Dept. of Geology,
Basins: Significance in Rashtrasant Tukadoji Maharaj Nagpur
Hydrocarbon University Mr.Jakate Prasanna
Exploration Hemant Old City,Amarvati

3.50-4.00 Role of communication Mr.Jakate Prasanna Hemant
for Integrated Rural Old City,Amarvati
Development

4.00-4.10 **TEA BREAK**

TECHNICAL SESSION II: Day 1:4 Jan'12:Wednesday:4.10- 5.20pm

4.10-4.15	Welcome Address by Session Chairperson	Dr. Jaykrushna Panigrahi Convener, ISCA Chapter Bhubaneswar, Odisha
4.15-4.25	Scientific Research and Intellectual Property Right	Pramod Kumar Misra Visiting Faculty, STEP, HBTI, Kanpur
4.25-4.35	Novel therapies in Biomedical Arena	Sachin Sharma Territory Business Manager, Religare, SRL, Jaipur
4.35-4.45	Poster presentation Popularizing simple Astronomical Instruments in Rural Schools	Mr. Nikunja Bihari Sahu Education Officer, Regional Science Centre, Bhubaneswar, Odisha
4.45-4.55	Oral presentation	Prof. (Dr.)Aruna Bhatia Dept. of Biotechnology, Punjabi University, Patiala
4.55-5.05	Oral presentation	Prof. H.R. Jayamma Dept. of Education, Bangalore University, Bangalore
5.05-5.15	Oral presentation	Dr. Narsegowda Head, Dept. of Biotechnology, Visweshwarapura College, Bangalore
5.15-5.20	Summing up of the session	Dr. Jaykrushna Panigrahi Convener, ISCA Chapter Bhubaneswar, Odisha
5.20-5.30	TEA BREAK	

TECHNICAL SESSION III: DAY 2: 5 Jan'12 Thursday: 2.00-3.30pm

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| 2.00-2.05 | Welcome Address by
Session Chairperson | P.Jayashankar
Director (Acting)
Principal Scientist & Head
Fish Genetisc & Biotechnology Division
CIFA, Bhubaneswar |
| 2.05-2.15 | Science and
Technological
Innovations for
Military Matters | Dr.AbhayaKumar Srivastava,
Dept. of Military Science,
D.A.V. College, Kanpur |
| 2.15-2.25 | Enhanced Production
of withaferin
A by raising Hairy
Root Culture of
Withania Somnifera | Manish Kumar Jain
Lecturer, Dept. of
Biotechnology, Dr.H.S.Gour
University, Sagar |
| 2.25-2.35 | Science and Technology
for Inclusive Innovation
and Role of Science
Communicators | Mr. Kamalakanta Jena
Dept. of Physics, Govt.
Women's College, Sundergarh |
| 2.35-2.45 | Science and Technology
for inclusive
innovation-role of
women | Dr.(Mrs.) Jyostna Sharma
PGT-Biotech,
Delhi Public School,
Ghaziabad Vasundhara |
| 2.45-2.55 | Science and
Technology | Dr. Charanjeet Kaur
Prof. & Head, Dept. of Physics,
Sri Satya Sai College for Women,
Bhopal |
| 2.55-3.05 | Science and
Technology :
The Role of Women | Ms.Anju Kulshrestha,
HOD, Physics, Springdale School,
New Delhi |

5th Vigyan Sancharak Sammalen

3.05-3.10	Summing up of the session	P.Jayashankar, Director (Acting), Principal Scientist & Head CIFA, Bhubaneswar
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TECHNICAL SESSION IV:DAY 2: 5 Jan'12 Thursday:3.10-4.10PM

3.10-3.15	Welcome Address by Session Chairperson	Dr. Pradeep P. Kundal Prof. & Head, Dept. of Geology, Rashtrasant Tukadoji Maharaj Nagpur University
3.15-3.25	Oral presentation	Dr. S. Thiyagarajan, Head, Deptt. of Mircobiology, Asan Memorial College of Arts & Science, Pallikaranai, Chennai
3.25-3.35	Science and Technology for Inclusive Innovation	Payel Chakrabarti Biroja, 105 ,Sukanta Place, Howrah, West Bengal
3.35-3.45	Role of Science & Technology for Inclusive Innovation	Samrat Dev, Baguiati, Kolkata
3.45-3.50	Poster Presentation Need for Strengthening Studies in Media Degree Programme	Dr. I. Arun Aram Asso. Prof. Dept. of Media Science, Anna University, Chennai
3.50-3.55	Poster Presentation Increasing Muscle Protein through Natural Zeolite	Dr. Meeta Mishra Lecturer, Dept. of Zoology, Dr. H.S. Gour University, Sagar

5th Vigyan Sancharak Sammalen

3.55-4.00	Poster Presentation Digital documentation and database of medicinal and economically important plants of Nagpur District	Ms. Madhuri Tarachand Thakre PGTD of Botany, Rashtrasant Tukadoji Maharaj, Nagpur
4.00-4.10	Summing up of the session	Dr. Pradeep P. Kundal Prof. & Head, Dept. of Geology, Rashtrasant Tukadoji Maharaj Nagpur University

**VALEDICTORY SESSION: 5th Jan' 2012 : Thursday: 4.00p.m.-5.00pm.
Venue-Hall-6,Campus-6**

4.00-4.05	Welcome Remarks	Dr(Mrs)Vijay Laxmi Saxena General Secretary (Scientific Activities) ISCA
4.05-4.20	Valedictory Address	Prof. Chittaranjan Das Chairman State Environment Impact Assessment Authority, Orissa
4.20-4.30	Presidential Address	Dr. Geeta Bali General President, ISCA
4.30-4.45	Distribution of Certificates by Chief Guest	
4.45-4.50	Summarization	Dr. Geeta Satpathy Asso. Dean, School of Humanities KIIT University
4.50-5.00	Vote of Thanks	Dr. Amit Krishna De Executive Secretary, ISCA

5th Vigyan Sancharak Sammelan (VSS)
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January 4-5, 2012

ABSTRACTS

**THE EFFORT FOR THE DEVELOPMENT OF SCIENTIFIC
APPROACH IN INDIA BY SCIENCE POPULARIZATION: A CASE STUDY**

Irfan Human

*(Awardee Dr. B.C. Dev Memorial Award for
Science Popularization 2011-12)*

*Editor-Science Times News & Views,
67 Anta, Shahjahanpur-242 001*

E-mail: research.org@rediffmail.com

Phone # : 09335525989

ABSTRACT

Human being has been involved in learning scientific methods by different sources like observing and experimenting various scientific approaches from ancient times. Scientific development is not the result of short period but has resulted through inventions and discoveries by many civilizations. There is a large number of people who believe in many illogical traditions and superstitions for ages. It is not necessary that people who have blind faith in these traditions are all illiterate but a good number of well educated persons are also involved in this group. This is the valid reason that popularization of science has become imperative in the country to develop the scientific attitude to achieve country's progressive.

The media plays science communication by an important role in communicating scientific approaches in this path, which reach to the distant places of the country. News papers, radio, TV and internet spread scientific messages to the common people of country regularly, but no special attention is paid for the purpose. We find a paradoxical situation when we observe regular and prominent columns on astrology and palmistry but scientific news get very little place in print media. The same situation is with the electronic media. We have some scientific reports or news on common channels very rarely and on the other hand, regular programs based on forecasting are broadcast on the daily basis. Where we should

5th Vigyan Sancharak Sammalen

make more beneficent use of various media provisions for spreading and developing scientific temperament in the country, is a burning issue! Though, some of the channels like Discovery, Animal Planet and Gyan Darshan, besides scientific radio programs do provide some valuable information, it is still inadequate in developing scientific approach en-masse.

In our country, many government and non-government programs are invited for common people for popularizing science among us. On the government level, National Council of Science and Technology Communication, Vigyan Prasar, Vipnet Clubs and State Council of Science and Technology, State Institute of Science Education are there is a old and renowned popular science organization Vigyan Parishad, Prayag at Allahabad in non-governmental specter and current organizations like Eklavya, Space, Research etc. are working for making scientific approaches popular in India. The impact of this process of popularization of science is taking place in the society slowly but surely. It is commendable that the new generation of this country has developed scientific temperament at large.

**CONNECTING COMMUNITY WITH KNOWLEDGE:
A STRATEGIC MEDIA CONVERGENCE**

Dr. Bijay K. Nanda

Hon. Executive Director
Sandhan Foundation
D/62, Block-11, Jayadev Vihar, Bhubaneswar, 751013, Orissa, India
Tel/Fax:0674-2360699, Mob: 09938371960
Email:bknanda09@gmail.com

ABSTRACT

Sandhan Foundation of Bhubaneswar, in conjunction with the **UNEP-GPA** and the **Government of Orissa**, has implemented an innovative management model 'Coastal Community Resource Center (**CCRC**)', at village 'Gupti' of the internationally known Mangrove Ecosystem of **Bhitarkanika**. The **CCRC** endeavors to connect the community with knowledge through strategic convergence on the purposeful conservation of coastal ecology. The coastal folks are canvassed to learn the importance of wise management of the mangrove forest both for the protection from the effects of climate change. It puts practices of mass media convergence to take advantage of developing a science oriented community with technology interface.

**CALCAREOUS ALGAE FROM INDIAN SEDIMENTARY BASINS:
SIGNIFICANCE IN HYDROCARBON EXPLORATION**

Pradeep P. Kundal

PG Department of Geology

*Rashtrasant Tukadoji Maharaj Nagpur University
Law College Square, Nagpur
E-mail: ppk_kundal@rediffmail.com*

The Calcareous Algae are those in which CaCO₃ is deposited by life processes and this CaCO₃ gives a skeleton for the entire plant or part of plant. Calcareous Algae are common in shallow marine and freshwater environment throughout the Phanerozoic. The present paper provides an account of multifarious applications of Calcareous Algae in hydrocarbon exploration such as in biostratigraphy, as potential tool for reconstruction of paleoenvironment, as builder of carbonate reservoir rocks and reefs. Despite this, the work on Calcareous Algae is scantily done by Indian workers. The oil companies are not using Calcareous Algae for exploration of hydrocarbon. There is an urgent need to intensify the search of Calcareous Algae from the carbonate horizons of all Indian sedimentary basins including basins which are commercially productive.

**ROLE OF COMMUNICATION FOR INTEGRATED
RURAL DEVELOPMENT**

Jakate Prasanna Hemant

Reporter, Sakaal Media Group

Regional office, Khaparde Bagicha, Near Railway Station, Amravati.

Email: prasannajh@gmail.com

India is known for Agriculture based economy and Panchayat Raj system. While moving towards 21st century it is necessary to use the techniques of Information Technology to make the base of agriculture and Panchyat raj more powerful. After the suggestion given by the Balvantrai committee, the state government of Gujarat has adopted the science and technology techniques in mode of computerization with the specialized technology i.e. Gujarat State Wide Area Network (GS-WAN). Around 13 thousand Gram Panchyats are connected with the taluka, district, regional and state headquarters through GS-WAN. Using this technique to speed up the process of development of rural areas it has become possible for the rural citizens in Gujarat to organize VDO conference meetings, on-line agriculture training, fund transferring, on-line auditing and account management etc by using GS-WAN technology. This will definitely help the rural community for developing innovative techniques in all walks of their day to day life.

By adopting such kinds of advance communication modes, it is now possible to broadcast weather reports, various government schemes and virtual education from primary up to higher secondary at rural level, management and communication during any type of natural calamity.

SCIENTIFIC RESEARCH AND INTELLECTUAL PROPERTY RIGHT

Pramod Kumar Misra

*Visiting Faculty, STEP
HBTI, Kanpur*

The intellectual Property Right laws are relatively new subject and has contributed world over in the promotion of research activities, by protecting the research outcomes in favor of the researcher and thereby rewarding in monetary and social terms. This has induced more and more persons to conduct the innovative research in the field of Science, Technology and agricultural field. The IPR laws are categorized in seven broad categories (a) Copyrights (b) Trademarks (c) Geographical indications (d) Industrial Designs (e) Patents (f) Semiconductors Chips and Integrated Circuits and (g) Trade Secrets.

For a scientific research the laws relating to GI, Industrial designs and Semiconductors are of great use. As per Sec 2(e) of Geographical Indications act 1999 means and identification which identifies certain goods as originating or manufactured from a particular locality with specific quality. This is an outcome of the TRIPS agreement in India. The GI has lot of usage even in Agricultural commodities. The Industrial designs are governed by the Designs Act 2000 which protects the Designs. The designs are defined as shape, patterns, configuration or ornamentation of an Industrial article. In order to get the protection under the design act, the act states that design must appeal to eyes, that can be applied to Industrial Article which identifies and distinguishes the product to the from the bulk could be protected through registration if is not commercially exploited earlier.

The Patents laws regulate the issue and maintenance of exclusive monopoly rights conferred to the inventor who invented a new product and process through his intelligent efforts which are capable of industrial applications. The new patent must have novelty, inventive step, written description and industrial application. The object of the Patent laws is to strike a balance between the promotion of technological Innovation and dissemination of its fruits among the general public. However the Govt. has power of interference through govt. acquisition or granting compulsory

5th Vigyan Sancharak Sammalen

license to the interested parties. The Patent act was brought in existence in 1970. In the original act, only the process patents were granted but subsequent to the TRIPS agreement the act was amended and the Product patent was also granted. The inventor gets exclusive rights for 20 years which he may assign or license to any third party. After lapse of 20 years it can be used by any person.

The Integrated circuits are defined as product having transistors and other circuit elements which are inseparably formed inside the semiconductor material designed to perform an electronic function. The IC and Semiconductor Act 2000 confer protection to IC which has not been commercially exploited earlier. The exclusive rights are granted for 10 years however the Government can use the registered circuits or chips without any authorization from owner. In all IPR laws there remedies available to owner against violation or infringement.

If, present IPR laws were not brought into existence, there might not have been so much research in innovative areas as the researcher could have not exploited the benefit of his hard work in the commercial field. The object of the legislature is to reward the inventor and also to balance it for the public benefit and it has acted as an inducement for further scientific research in various fields.

NOVEL THERAPIES IN BIOMEDICAL ARENA

Sachin Sharma

*Territory Business Manager
Religare SRL, Jaipur
Email - s.sharma97@yahoomail.com*

As quoted by an Indian News daily "India possesses the ingredients to become a science super power." A scientific revolution sweeping India will soon place it firmly within the major world of economics. Hundreds of biomedical scientists are pooling research to develop what may be the first effective cure for tuberculosis. The open source drug discovery project funded by government is creating the world's biggest online repository of information about tuberculosis bacterium and how to combat it. A global platform where the best minds can collaborate and collectively contribute to solve the complex problems associated with the discovery of novel therapies for neglected diseases is the need of the hour. New diagnostic tools for asthma, new generation thrombolyte molecules etc. promise a great future of innovation in science and technology. Hence global partnership with a vision to provide affordable healthcare to the developing world is of paramount importance, in this context.

**"SCIENCE AND TECHNOLOGICAL INNOVATIONS
FOR MILITARY MATTERS"**

Abhaya K. Srivastav

*Dept. of Military Studies
DAV College, Kanpur*

Scientific and technological innovation gave a new impetus to human society in every era. Invention of wheel paves the way to the then society for marching towards a new beginning. Wars always remained a closest part of the human society since time immemorial. Although wars, without exception, always cause loss, but on the contrast "every country have to face it on once in a generation." With the help of new invention, humane society's nature changed, and the nature of warfare also changed accordingly.

In the aftermath of World War II there was an increase in technological innovations and notably were the advancements in the field of computers and exploitations of electromagnetic spectrum. The Gulf War of 1991 has been widely accepted as transitional point which contains elements of the past i.e. the industrial form of warfare and elements of a new kind of warfare which exploited new technologies.

The paper, at length would discuss and analyze the scientific and technological innovations of military matters in years to come.

**ENHANCED PRODUCTION OF WITHA FERIN A, BY RAISING HAIRY
ROOT CULTURE OF WITHANIA SOMNIFERA**

Manish Kumar Jain

*Department of Biotechnology
Dr. H. S. Gour University, Sagar 470 003*

Withania somnifera (Indian ginseng) was transformed by *Agrobacterium rhizogenes*. Explants from seedling roots, stems, hypocotyls, cotyledonary nodal segments, cotyledons and young leaves were inoculated with *A. rhizogenes* strain MTCC 2364 obtained from MTCC, Chandigarh. Hairy (transformed) roots were induced from cotyledons and leaf explants.

The transgenic status of hairy roots was confirmed by PCR using nptII and rolB specific primers and, subsequently, by Southern analysis for the presence of nptII and rolB genes in the genomes of transformed roots. Four clones of hairy roots were established; these differed in their morphology.

The doubling time of faster growing cultures was 8 - 14 days with a 5 fold increase in biomass after 28 days compared to cultured, non-transformed seedling roots. MS-based liquid medium was superior for the growth of transformed roots compared to other culture media, with MS-based medium supplemented with 40 g l⁻¹ sucrose being optimal for biomass production. Cultured hairy roots synthesized withaferin A, a steroidal lactone of medicinal and therapeutic value. The concentration of withaferin A in transformed roots (157.4 µg g⁻¹ d. wt.) was 2.7 fold more than in non-transformed cultured roots (57.9 µg g⁻¹ d. wt.).

**SCIENCE AND TECHNOLOGY FOR INCLUSIVE INNOVATION
AND
ROLE OF SCIENCE COMMUNICATORS**

Kamalakanta Jena

*Head, Department of Physics
Govt. Women's Jr. College
Sundargarh - 770001 Odisha
Email ID : kkjena@in.com, kkjena1@gmail.com*

For a large part of recorded history, scientific knowledge was gathered for its own sake. Science had few practical applications then. But Industrial Revolution in the 18th century changed the scenario. Science has a profound effect on the way we live today. The use of scientific knowledge for practical purposes, known as technology, has altered our life style through numerous innovations. The breakthrough research in the field of electronics and communication has helped us reach the space. Science and technology play an important role in devising appliances we use, food we eat, water we drink and many other indispensable items.

However, scientific discoveries have a negative impact in human affairs. Industrial and agricultural chemicals, various emissions due to burning of fossil fuel in industries and automobiles, and rising tide of waste have altered the composition of the entire environment. Today, the foremost duty of science and technology is to work out innovative formula for the treatment of our environment in sickbed.

Science communicators have an important role in creating scientific culture in the hearts of young mass and common people. Students may be repelled by the research results of scientists expressed in symbols and equations. But its presentation in the language of common people is the job of a communicator. It would encourage the young generation to know more about science and technology. They would go for research and innovation in future.

**SCIENCE AND TECHNOLOGY FOR INCLUSIVE INNOVATION:
ROLE OF WOMEN**

Jyotsna Sharma

*PGT-Biotech,
Delhi Public School,
Ghaziabad Vasundhara.*

Science and technology have been the engines of profound social change.

Education enhances the intellectual, social and emotional development of women and enables them to meet their needs of daily life and contribute to the development of the Nation. It brings reduction in inequality in the social structure of the country. But, the irony in India is that although the deity of education is a female i.e., Goddess Saraswati according to Hinduism, innumerable number of women are illiterate. Around the world, women are under-represented in science and technology activities and careers that support economic stability and growth, especially in developing countries. In India science and technology have changed women's work over the past century in a significant and positive way. This has eased women's daily lives and has improved their quality of life by simplifying housework through labour-saving devices, allowing easy shopping on the Internet, and increasing the life expectancy of Indian women. Many women may work in science because they enjoy it and so dedicated to it. They often do not focus on barriers, but move forward, without caring for other roles much. The fields of engineering having almost 50% women representation are biotechnology engineering, bioengineering, and environmental engineering. In these fields of engineering, women combine their desire to help society with technological skills for solving societal problems. There are many examples where women scientists did inventions like Ford's Windstar program, a mini-van developed largely by

women engineers with women's preferences in mind, Rita Colwell's research on the fever with microbes in Africa and Barbara McClintock's work

5th Vigyan Sancharak Sammalen

on biological organisms. There is a long list of work done by women scientists, where I can never forget to quote work done by Ms Kiran Majumdar.

I also try to teach my girl students about general problems like aminocentesis, MTP, Adolescence problems. We discuss all the current topics like superbugs, Genomic research by group discussions and by using different modern teaching strategies. I always involve them in various investigatory projects to explore their scientific aptitude and enhance scientific temper. Though still there are many barriers but women scientists, teachers and girl students are doing their best to get recognized positions in scientific world.

INCREASING MUSCLE PROTEIN THROUGH NATURAL ZEOLITE

Meeta Mishra

*Department of Zoology
Dr. H. S. Gour University
Sagar 470 003*

Natural Zeolites are alumino-silicates of alkali and alkaline earth metals, having water molecule within their structural frame work. They have various applications in petroleum industry, water purification and also in animals to improve body weight, feed efficiency, reduced incidence and severity of diarrhoea, improve egg shell thickness, increases fat, protein and calcium content of cow milk etc. In the present investigation, role of natural zeolite chabazite on fish muscle protein contents studied. The experimental fish *Heteropneustes fossilis*, an important food fish collected locally and acclimatized prior to experimentation. Chabazite sample was first washed and then crushed to powder form before use. The exposure period was 180 days. After an interval of 30 days, fish muscle was removed and processed for protein isolation. Protein samples were analysed by SDS-PAGE. The protein bands thus obtained were compared with control, the band of interest which showed increase in protein contents, was close to 43 kd. The result indicates that chabazite plays an important role to increase protein contents in fish muscle protein. It is suggested that this widely available zeolite may be used in aquarium to clean water and to improve fish quality.

**DIGITAL DOCUMENTATION AND DATABASE OF MEDICINAL AND
ECONOMICALLY IMPORTANT PLANTS OF NAGPUR DISTRICT**

Maduri T. Thakre

PGTD of Botany

Rashtrasant Tukadoji Maharaj Nagpur University

Nagpur 440 033

E-mail: madhu_swt10@rediffmail.com

Nagpur is one of the districts in the Vidarbha (Maharashtra) with great biodiversity of plants with many economically and medicinally important plants and of which, some are rare and endangered plants. Digital database is prepared by selecting various morphological characters (>200) with a number of possible variable states as a model. The digital images are attached (after processing them) to the respective plant descriptions in the database. These digital images are attached (after processing them) to the respective plant descriptions in the database. This work is done using software, DELTA (Descriptive Language for Taxonomy) (Dallwitz et al, 2000), which is a taxonomic descriptive, identification and information retrieval package system and stores data with interactive key facility (Srinivasu, 2005). This digital technology has several advantages (clarity, original colors are retained and permanent, eco-friendly, no biodegradation, pathogenic/insect attack, retrieval of plants information in multifarious ways etc.)

The digital database of plants of Nagpur district now contains about 450 medicinally and economically important plants (out of 650 collected) belongs to 79 families were incorporated along with digital photographs till today. It includes economically important plants [Vegetable (14), Pulses (04), Spices (02), Dye-yielding (05), Timber yielding (21), Gums and Resins yielding (04), Oil yielding (05), Fruits edible (13), Seeds edible (08), Cultivated for its flowers (48), Ornamental plants (72), border or fence plants (12), Avenue plants (16), Pickles (03)] and Medicinal plants (325). This database also include rare (06), lower risk (01), endangered plants (01) to Nagpur district with full plant descriptions etc. Addition of plants to the existing database is in progress.

SCIENCE AND TECHNOLOGY - THE ROLE OF WOMEN

Anju Kulshrestha

*C- 102 Himachali Apartments
Sector 10, plat 36
Dwarka, New Delhi*

Women are universally under-represented in Science and technology. India viewed as potential power house of innovations is no exception. The subcontinents institutes of scientific learning are open to all its citizens, but the potential female researchers still hesitate at the threshold of laboratories and also their potential has gone untapped because they have become used to being subjugate and docile. Since last 20-30 years, women's movement in policy debates, Science and technology gained momentum and a great progress has been made in analyzing and responding to these concerns. Despite the road blocks, women have made headway into various fields including Science and Technology. It encompasses a broad range of activities. How they relate to women depends on how they are defined. Science is often equated with knowledge of the physical world and the phenomenon whereas the technology is the application of scientific knowledge to human life. One of the aspects of the role of women in science and technology is reaching out to the women of rural areas where the women are not allowed to interact with men educators. However, if a woman educator addresses the women folk, the programme becomes successful. She can easily impart the knowledge about implementing various tools/ concepts in daily life. The presence of women in the field of health has increased its legitimacy and the value of work in public perception. The new drugs for women have to be tested so as to know the effect on reproductive system, osteoporosis, contraceptives etc.

If India has to turn into a developed nation by 2020, it should encourage women to provide their unmatched and noble services in the field of science and technology.

SCIENCE AND TECHNOLOGY

Charanjeet Kaur

*HOD, Chemistry
Sri Sathya Sai College for Women
Bhopal*

India's glorious past is embedded with a rich Scientific and Technological Heritage from the Vedic age and is an inspiration to create a scientifically advanced and spiritually enlightened human society in which peace, prosperity and happiness together create a heaven on earth. Peace loving people, people with scientific bent of mind having a profound understanding of the purpose and meaning of life, who are able to decode the secrets of creation and serve the creator through service of man and nature is what, the wonder that was India which glittered like gold and spread its enlightenment all around the world. Zero, the most modest and most valuable of all numerals is one of the subtle gifts of India to mankind. The decimal system was known to Aryabhatta and Brahmagupta long before its appearance in the writings of the Arabs and the Syrians; Chemistry being the basic Science of Nature was pursued by ancient India's Scientists, to create Colors, Chemicals, Fertilizers, Warhead mater., food preserv., spices and above all Gems and Crystals. Purification of Silver, Gold and other precious metals.

All point towards a rich foundation of science in India from ancient times.

Today, the search for knowledge continues to produce an ongoing revolution in the health and wealth of humankind. "The ability to create and maintain knowledge infrastructure, develop knowledge workers and enhance their productivity will be the key factors in deciding the prosperity of the country." "Half a hectare of land and one year of labour were required to feed one person in 1900 whereas that same half-hectare now feeds 10 persons on the basis of just one and a half days of labour".

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Central role of science for knowledge creation is to provide Unique opportunities of Science to: meet basic human needs ,reduce poverty, protect the environment, improve the quality of life, enhance sustainable development, Preservation of indigenous & digital knowledge.

Globalization as a consequence of a number of economic reform trends including liberalization, privatization and decentralization

- **Technology** as mover in the age of globalization
- Role of the **Internet**, especially WWW
- Increasing **digital divide**: only 4.8 persons per thousand are online

We are today in a knowledge age where the wisdom of antiquity can be synthesised with the most modern science and technology.

India still needs to undertake serious reforms and investment based on these strengths.

SCIENCE AND TECHNOLOGY FOR INCLUSIVE INNOVATION

Payel Chakrabarti

Biroja

105, Sukanta Place, South Baksara

P.O. Baksara, Howrah 711 110

Inclusive development

More and more development in science and technology focus on specific input to society, but when its innovative application concerns mass, it is inclusive. Innovation in science and technology can only prove to be useful when it helps in development and sustenance of the society. And unless and until the innovation reaches the masses it cannot be said to be a successful innovation until it is tested and proved by time and people.

Sustainable innovation

It is important to understand how a development suits the Indian mass, when acceptable norms vary according to societies and cultural identity. Thus it can be said that when a useful item is developed, its message should reach the target people belonging to every walk of society, and media representation of the innovation becomes another innovation by itself. Innovation through science and technology must go along with our common understanding, it must cater to the needs of a range of user groups; utilize restricted (local) material as far as possible, local man-power available as well as man power can be easily trained and motivated to contribute to its effectiveness. Thus the development would be inclusive in nature and would be self sustainable application of science and technology in society, unwise dependency on other sources could be reduced, leading to economic development.

**ROLE OF MEDIA: MEDIATOR BETWEEN S&T AND
END USERS; AND PARTICIPATORY APPROACH**

Along with development of science and technology it is equally important to disseminate the information on innovation among the masses. On one hand it is important to communicate the innovation to the

entrepreneurs in order to make the innovation relevant to the masses; and on the other it is equally essential to understand the state of the art in various places so as to understand the present level of innovations, works being carried on and the prospects of the particular field. Media's role in disseminating the information can be seen as a tool to carry the innovation from the experimenting stage in labs to the end users. Media can act as a mediator between the innovation and the society; and representation techniques make such efforts effective. For development of product or sharing of information, if a participatory approach is taken, the users would become participants in the process, it would be easier to own the development and necessary modification as and when required during execution or implementation would be sustainable. Thus the development would be inclusive. And this process not only limits itself to communicating the information but it also depends on correct and suitable representation of the information regarding science and technology innovations so as to serve the purpose. Scientist and the end users must share their concerns; media needs to play an important role in this regard in providing means for effective communication. Off late it is seen that the media often overlooks the developments in the field of science and technology, and thus the innovations also go unnoticed by a large population. This, being the almost neglected sector of the media industry; the little coverage that it gets is usually very superficial in information. Thus it is seen that there is a need for the promotion of more expert and accurate information in media.

A PRIORITY NEED

A priority area in inclusive innovation may be today's growing need of innovative solution to meet the progressive age impairments that cannot be treated as illness but as support to the gradually reducing capabilities; the need is of an inclusive solution in nature. Today's science and technology may look towards such need. How the scientific world is

suppose to know the real need to be addressed, what is actually required to be attempted so that an innovation can benefit a large population and cover a common need. Proper source of information and a mediator between the scientific society and the society at large can be today's media. Thus media and scientific community should join hands together for the cause of the society.

ROLE OF SCIENCE AND TECHNOLOGY FOR INCLUSIVE INNOVATION

Samrat Dev

F/J 12 Jyangra Battala

Baguiati, Kolkata 700 059

Email: samrat30@rediffmail.com

The integral purpose of science is to explain the natural world through intellectual and investigative practices that involve observations and controlled manipulations of that world. In support of this, science can be most comfortably argued today in terms of a 'critical realist' stance.

The purpose of technology is to intervene in the existing world to produce something 'other' to that which currently exists. It achieves this through iterative intellectual and design-based practices that involve multiple sources of input. These input sources include a mixture of that defined as natural, material, simulated, conceptual, emotional, and imagined.

The concept of modernization on the societal level refers to the office as a place of work, its components, to the living quarter and its components, and to those aspects of behavior which govern individual's relations and his social interaction with those who live, work, or frequent these places. Modernization is thus a type of social change, which represents the movement of society on a path, which can be observed and measured. It is a process of interaction between so many variables that intermingle to produce the desired outcome.

Indicators on societal level will include modern structures such as

5th Vigyan Sancharak Sammalen

houses, schools, hospitals, shopping centers, roads, bridges and innumerable means of communication. Innovations in terms of power plants utilizing renewable energy resources, improved diagnostic tools for disease identification, discovery of life-saving drugs and extensive research on space sciences are some of the many applications of science and technology. Science and Technology is thus invariably taken as synonymous with and an inseparable part of Human development. In fact the advancement of human race is entirely dependent on science and technology provided they are utilized for the welfare of the society. It can be said beyond doubt that we are at the mercy of science and technology all our life.

**NEED FOR STRENGTHENING ENVIRONMENTAL STUDIES
IN MEDIA DEGREE PROGRAMMES**

I. Arul Aram

Associate Professor (Science Communication)

Department of Media Sciences

Anna University, Chennai 600 025

With the liberalization of economy in the early 1990s, market has taken the lead in the media too. India is no exception. New financial papers and channels have come up. News has become a commodity across the different shades of the media. Development has taken a backseat. Interestingly, this is the time when civil society has got stronghold. And for the media, development is mostly mediated through civil society. In a country like India, liberalization brought in prosperity to around 20 percent of the people. If not development, environment is a theme that links the discourse on poverty and affluence which exists side by side. Starting with the United Nations Conference on Human Environment in 1972 where the then Indian Prime Minister Indira Gandhi linked environment with poverty, environment has been a major concern of India. With the basic needs such as food, clothing and shelter even for the poor being met by welfare mechanism such as 100 days of assured employment and the public distribution system in the last two decades, health and environment have become much talked about subjects. This is because most people have started giving attention to a good quality of life. Have the media departments in India intervened in these two areas? No. Agreed that health is a complicated subject, but what about environment? Introduction of a paper on Environmental Communication should not be difficult at the postgraduate level. Already, based on a Supreme Court directive of 2003, environmental education has been made compulsory in schools and colleges (undergraduate level). But senior media academics of today who have not gone through environmental education at their school level are allergic towards teaching environment science, and more so, they are not equipped to link environment science with their parent discipline of media studies.

5th Vigyan Sancharak Sammalen

Even the best of media institutions like Loyola College, Chennai, which introduced Environmental Design as part of B.Sc. (Visual Communication) has later discontinued it as the media teachers are disinterested in handling the subject. But most undergraduate media programmes have a general paper on environment education. Uniquely, Anna University which has started an M.Sc. (Science Communication) degree has 'Environment and Media' as a compulsory paper, and found it to be worthwhile. In the recent period, the public have started debating scientific topics such as climate change and genetic modification. Let us take the case of the Bt brinjal controversy in India where civil society is opposed to cultivating edible genetically modified crop for the reasons that it will affect bio-diversity in brinjal, be harmful to humans and environment, and pests are likely to develop resistance to Bt toxins. On the other hand, scientists and corporations who support Bt brinjal argue that Bt brinjal is needed to reduce crop loss due to pests and to cater to the raising demands of commonly-used vegetable like brinjal. Unlike other disciplines, there is a fit case of introducing a paper on Environmental Communication relating Environmental Education with Media Studies, both at undergraduate and postgraduate studies. The study is based on interviews with undergraduate and postgraduate media students and teachers.

**POPULARISING SIMPLE ASTRONOMICAL
INSTRUMENTS IN RURAL SCHOOLS**

Nikunja Bihari Sahu

*Education Officer, Regional Science Centre,
Pt. Jawaharlal Nehru Marg, Bhubaneswar-751013 ODISHA*

Several astronomical instruments were in use in ancient India (as described in various Siddhantas and Samhitas) for carrying out a number of astronomical measurements. These instruments are low-cost, simple in construction, yet demonstrate many important aspects of astronomy. Although a number of modern instruments capable of highly precision measurements are now in use, there is still a need for introducing some of the ancient devices in schools, especially in rural areas (where paucity of funds limits their acquisition of costlier equipments available in the market) as a supplement to the class- room education.

The Paper discusses how one such classical instrument called Shanku (the Gnomon, a vertical stick of measured height fixed vertically on a levelled ground casting shadow by the Sun) can be used in rural schools for determining the Altitude, Zenith Distance and Declination of the Sun , its position in the Zodiac belt , the Latitude and Directions of a place and many other things.

