

Science and Technology Reporter

A Quarterly Newsletter of the Haryana State Council for
Science and Technology



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SS Prasad, IAS
Financial Commissioner & Principal Secretary,
Science & Technology Department,
Haryana

Chairman's Remarks

As 2010 has started rolling, publication of our official newsletter, Science and Technology Reporter has completed its first year. The newsletter has received an overwhelming response from all quarters. This is a matter of great satisfaction for me and my entire team. But it surely places great challenge of making the Reporter more interesting and responsive.

Department of Science and Technology, Government of Haryana in collaboration of Kurukshetra University has organized a science conference, to commemorate the birth centenary of Dr Homi Jehangir Bhabha, on January 23rd - 24th, 2010 at Kurukshetra. The conference was designed to address the problem of declining popularity of sciences among students. This proved to be a mega event wherein leading scientists of the country delivered popular lectures. A huge number of students from all over Haryana had the rare opportunity to share and interact with galaxy of top scientists.

While we keep on striving to improve and meet your expectations in educating you on the developments in this sector, I also look forward to your valuable suggestions and feedback to make the Reporter more meaningful. Let us join hands to walk together.....

S.S. PRASAD

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From Director's Desk

Science and Technology are the drivers of economic growth and science education the back born of all scientific and technological efforts in any region/country. Science education has recently becoming a concern in Haryana State with the declining interest of students in pure science. Department of Science & Technology (DST), Haryana Government is taking a multifaceted approach to engaging students in science and inspiring some of them to choose career in research.

Also, since in emerging scenario and competitive economy, science is being regarded as one of the most powerful instrument of growth and development, the research project should have relevance to national needs and tomorrow technology. DST, Haryana along with Haryana State Council for Science & Technology is making efforts in planning and imposing programmes ranging from funding of research projects for improving social economic condition in Haryana to promotion and popularization of science education.

SANDEEP GARG

STATE LEVEL GEO-SPATIAL STEERING COMMITTEE NOTIFIED

With a view to bring about uniformity and rationality in the use of geo-spatial technology in the State, a State Level Geo-Spatial Steering Committee has been constituted under the Chairmanship of Chief Secretary, Haryana vide Haryana Government notification no. No.S&T/2009/804 dated 03.06.09. Administrative Secretaries of various line departments of Haryana Government and some experts from Department of Space and Department of Science and Technology, GOI have been made the members of the committee. The mandate of the steering committee would be to:

- i. Advise line departments in the use of geo-spatial technologies in the preparation of their developmental plans.
- ii. Formulate policies/ guidelines for the use of geo-spatial technologies in the state.
- iii. Facilitate sharing of Geo-spatial information among various departments and users.
- iv. Monitor the implementation of remote sensing and GIS related plans of the state.
- v. Devise ways and means for promotion of Geo-informatics education in the state.

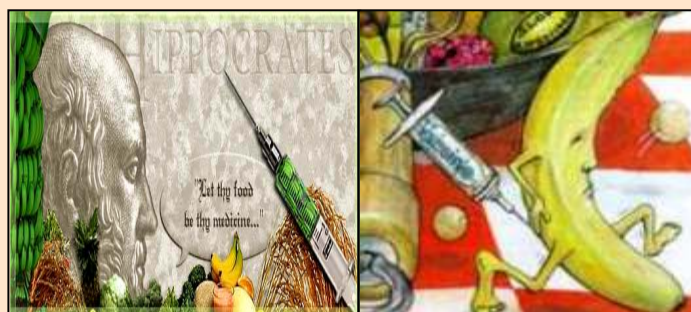
EDIBLE VACCINES - LET THE FOOD BE THE MEDICINE

A young lady takes her one year old child to the doctor for vaccination. In the hospital the little toddler starts crying after looking at the needle the nurse was holding. Doctor calms down the child by giving him a banana and instructing the woman to make him eat the whole of it. After some time the eager woman again asks the doctor "How much we have to wait for our turn for vaccination?" Doctor replied "Till your kid finishes the banana and after that - ITS DONE". He persuades the surprised and confused lady about the new method of vaccination. The situation looks much like a science fiction. And it may be here, at the fusion of plant biology, genetics and immunology, where Hippocrates' celebrates the proverb becoming a reality: "Let thy food be thy medicine".

In the recent past, the areas of plant molecular biology and immunology have made considerable advancement. The advanced vision and cooperation of the scientists of these fields, who have stepped out of their own territory for conducting interdisciplinary research, has led to the creation of genetically engineered plants, whose edible parts contain proteins that can function as oral vaccines. A new paradigm of vaccine production is emerging: very safe and low cost vaccines available in a convenient delivery system. These plant based edible vaccines could simplify vaccination and increase compliance.

Today, scientists are working on several plants including potato, tomato, banana, carrot, tobacco, maize, etc. Transgenic tomato for diphtheria-pertussis-tetanus (DPT) vaccine is on its way to development. Transgenic tobacco has been successfully engineered for the production of edible vaccines against Hepatitis B. Potato is one of the good sources for vaccine production and cholera vaccine has been successfully developed in it, but to limit its usefulness, the raw potatoes are not palatable and cooking destroys most of the protein antigens. Banana is the ideal plant for oral vaccine production due to its excellent digestibility, palatability and availability throughout the year. Vaccine for hepatitis B has been successfully made in banana.

Edible vaccines can replace traditional vaccines which are expensive and difficult to store, distribute and dispense and also they are in short supply. Most staple



(Photographs-Courtesy : http://whyfiles.org/166plant_vaccines/biblio.html,
<https://sites.google.com/a/brvgs.k12.va.us/edible-vaccines/home-1>)

vaccines are already being produced at capacity; there are simply too few to go around. The new technology is especially appropriate for developing countries where safe, inexpensive, and readily available vaccines are urgently needed for universal childhood immunization program.

Although edible vaccines hold great potential, especially in the Third World countries, the research in this field is still at a very early stage. There are still concerns about their efficacy and side-effects. Expression of adequate amounts of vaccine from plants itself is proving to be a challenging task, let alone converting it into an appropriate immunological response in people. Even if it elicit immune response still it is difficult to define its ingestion dose in people. Due to absence of standard sized bananas, tomatoes, people could ingest too much of the vaccine, which could be toxic, or too little, which could lead to disease outbreaks among populations believed to be immune.

Despite all odds associated with these vaccines, they can prove to be bliss for the underprivileged, if they are a success, as they will be easily reachable to a wide population. Every major discovery in past had to go through problems during its course of development. A classic example is that of "Golden Rice" which also faced criticism till its final approval, but now it has proved as a great success for the undernourished people of Africa. Who knows that "Do boond jindagi ki", the much used tagline in polio eradication programme in India, may become "Do kele (banana) jindagi ke" in the near future.

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RELEASE OF RESOURCE ATLAS OF ROHTAK DISTRICT

Haryana Space Applications Centre (HARSAC), Hisar of Department of Science and Technology, Haryana, has embarked upon an ambitious project on GIS based resources and infrastructure mapping in the State. Project envisages creation of digital databases for each district on 1:50,000 scale for the rural areas and 1:2,000 scale for the urban areas. The database to be created under the project would include linear features (roads, railway lines, canals/drainage network, settlement locations), administrative boundaries (state, district, tehsil, block, village, assembly and parliamentary constituencies, police station jurisdiction etc.), natural resource maps like water bodies, forests/ plantations, land use/ land cover, soils, geology/ geo-morphology, wastelands, cropping patterns, crop rotations, ground water prospects, land degradation, etc.), GPS locations of government infrastructure and facilities in all the villages and marking on the base maps the basic urban amenities, major land marks, institutions, facilities, govt offices etc for each town (schools, colleges, technical, vocational institutions, health centres, veterinary hospitals, police stations, water supply schemes, bus stands, railway stations, mini secretariats, judicial complexes, power houses) and census data (households, population, SC population, sex ratio, literacy rate, number of voters, etc.). A sum of Rs. 298 lacs have been sanctioned to HARSAC by Government of Haryana for taking up this project.



Hon'ble Chief Minister, Haryana, Sh. Bhupinder Singh Hooda released the Resource Atlas of Rohtak district at Chandigarh

As a pilot study to test the project design and its implementation, HARSAC has created the digital database of Rohtak district. Using this database it has also prepared a Resource Atlas of Rohtak district on 16.12.2009. Sh. Randeep Singh Surjewala, Hon'ble Minister of Science and Technology, Haryana, Sh. S.S. Prasad, IAS, Financial Commissioner and Principal Secretary, Department of Science and Technology, Haryana and Sh. Sandeep Garg, IAS, Director, Science and Technology, Haryana were also present on the occasion.

NEW PROJECTS INITIATED

1. GIS based resource and infrastructure mapping in Haryana

Under the project digital datasets related to various natural resources and infrastructure would be compiled for the entire state on 1:50,000 scale. All the government assets in each and every village of the state would be mapped using hand held GPS. All the data to be created under the project and any other spatial data available with other state government agency in digital format would be put on Geo-portal. This Geo-portal would be connected to all the line departments of the state at block level through State Wide Area Network (SWAN) being developed by IT Department, Haryana. This would facilitate easy access of all the digital databases and

information by the line departments which could be used in preparing their development plans. A sum of Rs. 2.98 lacs have been sanctioned by Haryana Government for this project.

2. Mapping of unauthorized colonies in MCs of Haryana

As Haryana Government has decided to regularize the unauthorized colonies in various Municipal Committees of the state based upon specific guidelines, it has been decided by the Department of Urban Local Bodies to get all the colonies demarcated and mapped using high resolution satellite data through HARSAC. HARSAC is using freshly acquired Quick Bird data to demarcate and map these colonies in 76 towns of the state.

ZONAL SEMINAR ON PLANT BIOTECHNOLOGY ORGANISED AT CPB

A one day Zonal Seminar on “Abiotic Stress Tolerance in Plants: Physiological and Molecular Approaches” was organized at the Centre for Plant Biotechnology (CPB), Hisar on 5th December, 2009. Dr. S.K. Sawhney, Professor and former Chairman of Department of Botany, Delhi University, Delhi inaugurated the event as the chief guest. Dr. Sain Dass, Project Director, Directorate of Maize Research, New Delhi delivered the keynote address in the seminar. The inaugural session was started by lighting of lamp by Dr. S.K. Sawhney, Dr. Sain Dass, Dr. P.S. Deshmukh (President, Indian Society of Plant Physiology), Dr. A.K. Dhawan (Vice President, Indian Society for Plant Physiology) and Dr. Neelam Sawhney (Vice-President, K.K. Nanda Foundation for Advancement of Plant Sciences) and Dr. Rajwant K. Kalia (Organizing Secretary of the Seminar). The seminar was sponsored by ISPP, KKNF and financial assistance was given by CSIR, New Delhi. The seminar was attended by delegates from all over Northern India particularly from Jammu, Chandigarh, New Delhi, Haryana, U.P., Himachal Pradesh, Uttarakhand, etc. During the plenary session, Dr. Subhash Minocha (University of New Hampshire, USA), discussed the sensing mechanisms in plants against abiotic stresses. Dr. T. Mohapatra (NRCPB, New Delhi) explained the functional genomics approaches for identifying water stress resistance genes in wild relatives of crop plants, which can be used in transgenic plant development after validation in cultivated crops. He explained his work on oilseed mustard and its wild relatives. An overview of physiology of water-logging tolerance in plants was



Zonal Seminar organized at CPB on 5th December, 2009

given by Dr. R.K. Sairam (IARI, New Delhi). Dr. Renu Deswal (Delhi University, Delhi) delivered a presentation on cold stress induced s-nitrosylation mediated RUBISCO inhibition in *Brassica juncea*.

In Poster session, several eminent scientists and young researchers presented their research work concisely. The first, second and third Prizes for best posters were given to Ruma Devi, Jyotsna Bhardwaj and Pooja Choudhary, respectively. KKNF award for best poster was given to Deepika Choudhary. Dr. Sawhney greatly appreciated CPB faculty for excellent organization of the seminar and commented that such kinds of seminars are two-way process learning from the accumulated experience around the table, as well as, to share one's own knowledge. In addition these provide a platform to present the latest research going on in various fields of plant sciences & biotechnology.

PIC - HISAR HAS OPENED TWO IPR CELLS IN HARYANA

Patent Information Centre (PIC), Haryana at CPB, Hisar has opened two IPR cells; one at BPS (Bhagat Phool Singh) Women University, Khanpur Kalan and another at Chaudhary Devi Lal University, Sirsa. It has already opened the cells at Deenbandhu Chhotu Ram University of Science and Technology, Murthal

(Sonepat) and Guru Jambheshwar University of Science & Technology (GJUS&T), Hisar under the scheme at CPB, Hisar from Department of Science and Technology, Government of India, New Delhi provided financial support for establishment of these Cells.

TRAINING/ AWARENESS PROGRAMS/ SCIENCE POPULARIZATION ACTIVITIES

1. HARSAC participated in state level exhibition at Kurukshetra during the eve of Geeta Jayanti Mahotsav from 24th to 28th November, 2009 as a part of awareness program to the society. Scientists of HARSAC made people aware of the potential use of Space Technology Applications for Societal Benefits. Dr. Rohtas Singh, Research Associate, Mr. Naveen Kumar, SRF, Mrs. Sharbati, Project Fellow, Mr. Anil Kumar and Ms. Ishu Verma, Technical Assistants from Centre for Plant Biotechnology, Hisar also participated.



View of HARSAC Stall in Geeta Jayanti Mahotsav at Kurukshetra on 24th to 28th November, 2009.

2. CPB, Hisar is engaged in conducting science popularization programs in the state and organizes 1-2 days orientation courses on plant tissue culture for farmers, teachers and employees of various user departments including forest, horticulture and sugar federation.



Students from Senior Model School, Hisar at CPB

CPB stall at Geeta Jayanti Samaroh 24th-28th November, 2009 at Kurukshetra

3. One week school teachers training program on Remote Sensing and GIS was conducted at Haryana Space Application Centre (HARSAC), Hisar from 19.10.09 to 23.10.09. Twenty seven science and geography teachers from various high and senior secondary schools of Haryana participated in the program.

4. HARSAC participated in International Trade Fair held during 14th to 27th November, 2009 at Pragati Maidan in New Delhi. People from all sections of the society visited and appreciated HARSAC pavilion with exhibited various Remote Sensing, GIS & GPS application activities of HARSAC.



Hon.'able Governor Sh. Jagannath Pahariya viewing the HARSAC activities in Haryana Pavilion in IITF-2009, Pragati Maidan, New Delhi on 17.11.2009.



Hon.'able Chief Minister Sh. Bhupinder Singh Hooda viewing the HARSAC activities in Haryana Pavilion in IITF-2009, Pragati Maidan, New Delhi on 15.11.2009.

CONFERENCES / SYMPOSIA AND MEETINGS ATTENDED

- ◆ Dr. R.S. Hooda, Chief Scientist, HARSAC, participated in ISRS Annual Convention and National Symposium on "Advances in Geo-spatial technologies with special emphasis on sustainable rainfed agriculture" held at Nagpur from September 17th-19th, 2009 and chaired a session on "Geo-spatial Technology in Natural Disaster Management" on 19.09.09.
- ◆ Dr. Manoj Yadav, Assistant Scientist, participated in ISRS Annual Convention and National Symposium on "Advances in Geo-spatial technologies with special emphasis on sustainable rainfed agriculture" held at Nagpur from September 17th-19th, 2009 and presented a paper on "Analysis of crop rotations of Haryana using multi-date remote sensing data".
- ◆ Dr. Rajwant Kalia, Senior Scientist, Dr. Rohtas Singh, Research Associate, Mr. Naveen Kumar, SRF, Mrs. Sharbati, Project Fellow, Mr. Anil Kumar and Ms. Ishu Verma, Technical Assistants, CPB attended National Conference on "Frontiers in Plant Physiology towards sustainable agriculture", 5th-7th November, 2009, Assam Agriculture University, Jorhat. Dr. Rajwant K. Kalia also chaired the session on Molecular Biology and Tissue Culture.
- ◆ Dr. Rajwant Kalia, Senior Scientist, CPB attended the meeting at DBT on 1st Oct, 09 to present the progress report of *Commiphora* project and *Hippophae* project.
- ◆ Dr. Aditi Arya, Technical Supervisor and Dr. Kamla Malik, Technical Officer attended one day National Seminar on "Biodiversity : Concerns and Solutions" organized by Department of Botany, MDU, Rohtak on 20th November, 2009.
- ◆ Dr. A. K. Dhawan, Director PIC, Haryana and Dr. Satish Mehta, Project Scientist Attended 12th All India PIC Interactive meet organised by Tamil Nadu State Council for Science & Technology on 21st to 22nd December, 2009 at Chennai.

HARYANA VIGYAN RATNA AWARD 2008-09 FOR DR R K KOHLI



Prof. R. K. Kohli

'Haryana Vigyan Ratna' award is meant for scientists above the age of 40, and carries a cash award of Rs.1.00 lakh, a citation and a trophy while 'Haryana Yuva Vigyan Ratna' award is meant for scientists below the age of 40, and carries a cash award of Rs.50,000/-, a citation and a trophy.

Scientists who have been born in Haryana or have spent a considerable part of their career/ studies in Haryana are eligible for the awards.

As a new initiative, Department of Science & Technology, Haryana, has instituted 'Haryana Vigyan Ratna' & 'Haryana Yuva Vigyan Ratna' Awards, to honour eminent scientists from Haryana, who have made outstanding contributions in the field of Science & Technology.

'Haryana Vigyan Ratna'

A high level Committee, constituted for the purpose, examined the nominations. Sh S S Prasad, IAS, Financial Commissioner & Principal Secretary, Science & Technology Department, Haryana, informed that the Committee, after thorough deliberations, selected Dr R K Kohli, Chairperson, Department of Botany, Panjab University, Chandigarh for the 'Haryana Vigyan Ratna' award 2008-09. Dr Kohli who is born in Gurgaon, has had an illustrious career with around 28 years of research work. He is credited with more than 200 publications, 2 patents and many scientific awards and honours like Punjab Rattan, B P Pal National Environment Fellowship Award, Vijay Shree Award, State Honour for teaching and research in environment, etc. His work on demonstration of the role of allelopathy in loss of species diversity & crop productivity; mechanism for successful establishment of invasive weeds and mode of action of various pure natural compounds of herbicidal interest, is widely appreciated.

“DISTINCTION AWARD 2009” FOR DR. ASHOK K. DHAWAN

Dr. Ashok K. Dhawan, Director (T), CPB, Hisar has been awarded the “Distinction Award 2009” for the year 2009 by Society for Promotion of Plant Sciences Research, Jaipur for his contributions to Plant Sciences.

The award was presented to him by Dr. Kasturi Datta, Professor, JNU, New Delhi during the National Seminar on “New Biology and Plant Engineering” held at Jaipur National University, Jaipur.

TRAINING COURSES ATTENDED

1. Dr. Rajwant K. Kalia, Senior Scientist, CPB attended a twenty-one-day training course on “Quality Enhancement: Conventional and Molecular Approaches” organized by ICAR in the Genetics Division, IARI from 15th July – 4th August, 2009.
2. Mr. Sunil Kumar, Technical Assistant, CPB attended twenty one days training course on “Basic Molecular Biology Techniques and Recombinant DNA tools” organized by College of Vety. Sciences, CCS HAU, Hisar.

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