BioSpectrum the business of Bio & Health Sciences

Herbal Harborage

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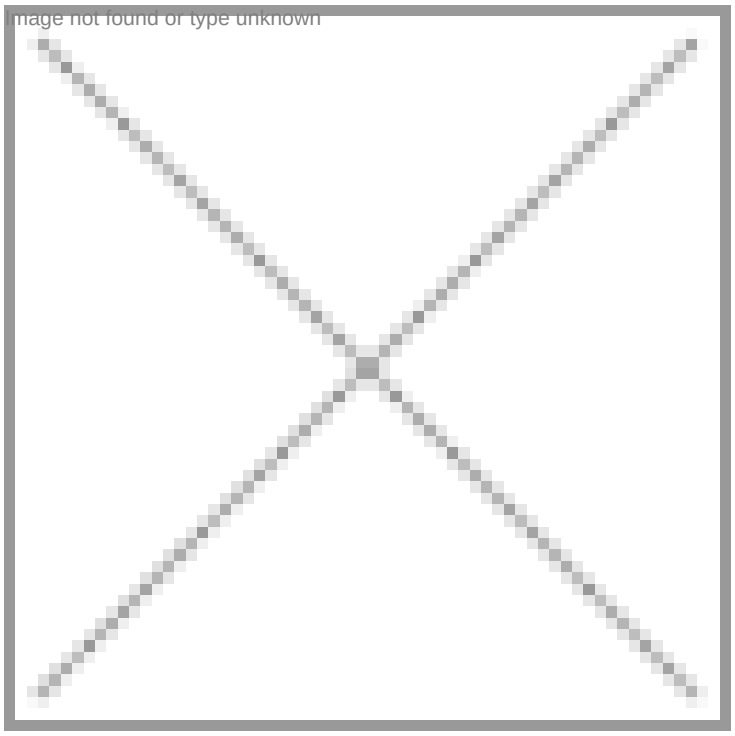
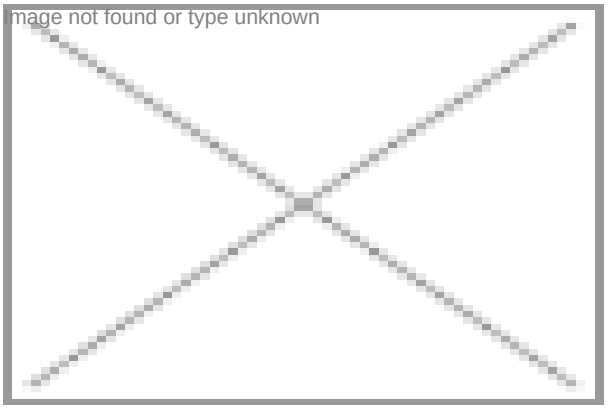




The legendary royal garden of the erstwhile Oudh kings, "Sikander Bagh", who ruled the region during the 19th century before being taken over by the British in 1857, is today the home of the premier national plant research center in the country. And NBRI is celebrating the global jubilee of its formation this year. Over the past fifty years, it has made patient strides scouting for patents and plants. CSIR took over the National Botanical Garden in 1953 and expanded the scope of the institute into a multidisciplinary plant research centre and it was renamed as the National Botanical Research Institute in 1978. Ever since, the institute has produced innumerable varieties in horticulture, products as functional foods and filed almost 30 patents in India and abroad. Today, it is an internationally known research center that focuses on both basic and applied research in various aspects of plant sciences for the conservation and sustainable utilization of plant genetic resources for human welfare.

Plant health, economic wealth

What keeps NBRI going? Dr P Pushpangadan, director, NBRI explains, "Unless we love the nature, it is difficult to work for it. To sustain our natural harmony, we all have to work for the same. At NBRI, we are all working to produce good quality eco-friendly products." Its mission is to be a premier national and international center on plant science research and development,

be the prime catalyst in the conversion of plant wealth into economic wealth and develop as a national referral center for the knowledge base related to plant biodiversity.

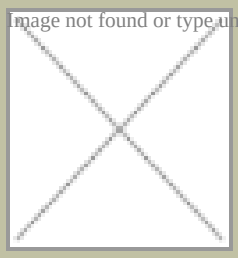
Offering consultancy and technology, today, it caters to the needs of every aspect of plant research in the South Asian region in general and India in particular. In that mission, its practices encompass biodiversity, bioinformatics, biomass biology, biotechnology, conservation, ethnopharmacology, floriculture, plant physiology, genetics and plant breeding, molecular biology and genetic engineering, natural product development, etc.

NBRI is rich in scientists and knowledge base. For instance, Dr Rakesh Tulli and his group work in the area of plant molecular biology. Dr Tulli informs, "The main objective of our work is to develop transgenic plants improved for agronomically important characters. Characterization and designing of genes for toxicity to insects is also a part of our research. Apart from these, we also offer consultation and contract research for the biotech industry." Dr Shantha Mehrotra is another eminent scientist there. The Department of Science and Technology presented her the leading women scientist award recently. She is working on identification, authentication and evaluation of medicinal plants/raw drugs by modern pharmacogenic methods which include correct taxonomic identification of plants and their parts, macro-and microscopical details, histochemical and biological analysis of the plant parts used as medicine, SEM studies of plants parts. Mehrotra adds, "We are working on to produce quality evaluation and standardization of herbal drugs and products and scientific validation of ethnobotanical claims."

With a rich heritage of research, the institute is not confining its research activities to the laboratories alone. It is looking at spreading awareness among the masses through various means and ways. Says Dr Pushpangadan, "We have established a garden for "housewives" in to which we welcome housewives and educate them about the easy biotech application in their daily life. We also have a lab exclusively for kids. In this lab, kids can use any instrument they like. These are the various types of awareness programs which NBRI conducts regularly."

NBRI recognizes that technology developed in any laboratory cannot be considered as successful unless it reaches the market. Agrees Dr Pushpangadan, "It is always difficult for the scientific society to develop the skills to market their inventions. For that we opt for industrial collaborations. But at NBRI, we are planning to recruit proper MBAs for marketing our products. This way we can reach the market in a proper way. CSIR has granted two posts for the Business Development Unit at NBRI." The message from NBRI director is crystal clearâ€""Biodiversity and the associated indigenous knowledge systems are the two invaluable capital assets of countries like India. They can be utilized profitably to generate a number of IPR-covered high value products and technologies for domestic as well as international trade."

"Personalized medicine is the future of modern medical field"



NBRI director Dr P Pushpangadan outlined his organization's future plans to BioSpectrum.

What are the emerging segments of plant biotechnology?

Herbal technology is an emerging field. It has applications in areas like cosmetics and health food. The institute is very much involved in programs of linking traditional knowledge into biotech. This is called herbal technology. NBRI has also set up a "Herbal Standardization Committee", the motive of which is to identify the right raw material for making any herbal drug. We develop drugs of preventive, promotive and corrective in nature.

Nutraceuticals is another form of herbal-based preventive and promotive medicine. NBRI is actively working on developing nutraceuticals. The main objective of the institute in this area is to identify the natural sources for phytochemicals/phytonutrients and development of technology package for nutraceuticals/functional foods as health care system.

To what extent has India's biodiversity been explored?

The utilities of the Indian plants have been explored only to some extent. This is because we do not have any databases available for the same. Neither have we any "shared" knowledge base on this issue. Tribals have very good knowledge of biodiversity but we cannot use it.

NBRI is actively involved in making a "Passport Data of Important Wild Genetic Resources" with reference to their aromatic and herbal values. We are also working on categorizing the toxicology of plants. We are working along with the representatives of other medical fields as like Ayurveda, Sidha, and Unani. In this way we are trying to build a bridge between gene-diversity and traditional wisdom.

What is the future of diet, food and medicine systems?

Personalized medicine is the future of modern medical field. Under this, doctors will explore a patient's gene and then give the dosage accordingly. Scope of personalized food is huge. Especially for the diabetic or heart patient, personalized medicine and food are needed. At NBRI scientists have developed herbal products for children, designer food for patients of hypertension and diabetes and functional food for pregnant women.

Nutritive security is widely needed in the case of pregnant women. We have categorized the nutritive requirement of women as per the development stages of the child. As a functional herbal drink, we have produced "Nibra" as a healthy soft drink with 1 per cent alcohol.

How do you rate traditional medical practices such as Ayurveda, Sidha and Unani in this modern world?

These traditional medicinal practices have some very important qualities which can easily be absorbed into modern medicines. Their values can be understood after having a look at the present western culture. The western people are more inclined towards the Ayurveda than the Indians. We have involved experts from Ayurveda, Sidha, and Unani in our NMITLI project to develop anti-virals for Hepatitis. This project is coordinated with RRL, Jammu, IICT and Dabur.

What is the scenario of botanic gardens globally and where does India stand in this segment?

In a global survey done by some US agency, it was written that about 200 million people around the globe visit botanic gardens every day. Though India has 145 botanical gardens, only 11 of them are of that standard which get more than 1,000 visitors daily.

Research activities

Here is a list of research areas at NBRI.

Biodiversity research by inventorying, monitoring, assessment, conservation and sustainable utilization of plant genetic resource of India with special focus on medicinal, aromatic, dye and gum yielding plants.

Bioprospecting for search of commercially valuable genes, biodynamic compounds and development of scientifically validated, value-added and standardized novel plant productsâ€”herbal drugs, pharmaceuticals, nutraceuticals and cosmaceuticals.

Biomass biology including biopesticides, biofuels and petroleum alternatives, and environmental sciences including phytoremediation and abatement of terrestrial and aquatic pollution including studies on greenhouse gas emission.

Bioinformatics by developing computerized/electronic databases on Indian plants with special focus on medicinal, aromatic, dyes, gum and tannin yielding plants and rare and threatened plants of botanic gardens and implementing applications of IT in plant science research and development of bio-information products.

Biotechnology (biotech processes/ products) including trans-disciplinary studies on molecular biology and genetic engineering for development of transgenic plants.

Genetics, plant breeding and agrotechnology includes selection and genetic enhancement for development of new promising

varieties of economically important non-crop plants.

Herbal products

Lipstick, Luvstick: This is developed from purely natural herbal colorants composition blended with selected essential oils or aroma isolates that are capable of altering the mood and mental perception of the person who applies the lipstick. The aroma acts as mood lifting, antidepressant, anti-stress, stimulant, soothing, creative thought inducing, anxiety reducing, sensual pleasure providing, fragrant and refreshing agents.

Fermented drink, NBIRA: It is a mild herbal beverage, like beer, with 2-3 percent alcohol content. NBIRA is fortified with other health protective and promotive attributes such as hepatoprotective, antioxidant, immuno-enhancing, anti-stress, and anti-fatigue properties. The beer is developed from a fruit, which is available in bulk and is cheap and has powerful antioxidant, immuno-modulator and diuretic properties.

Soft drink, NBIRASOFT: These herbal drinks contain a combination of 5-6 extracts from indigenous medicinal plants, which are fortified with other health protective and promotive attributes such as hepatopro-tective, antioxidant and immuno-modulator besides providing instant energy and vitality.

Dry color powder, Gulal: The invention relates to a process for the preparation of synergistic herbal dry color composition by lending of natural dyes with natural ingredients in specific proportions and under specific conditions. The resultant color powder thus prepared has synergistic action of natural dyes and natural ingredients resulting in good sticking capacity of skin and easily removable by soft mop. These colors can be used for playing Holi, cultural dances, and making rangoli.

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Nutra-Preg 16: This product is for women who are one-six months pregnant. It is for optimum health of the mother and helps brain development of the foetus/infant.

Nutra-Preg 79: This is for seven-nine months pregnant-women, used for the same purpose as Nutra-Preg 16.

Nutra-Lact: A product for lactating mothers that succors good health and postnatal care of lactating mother and child.

Nutra-Wom GH: This is for the general good health of women.

Nutra-Kid: It helps the infants and children up to two years of age to have optimum physical growth and good development of nerve (brain).

Nutra-Child: General good health of adults of all age groups.

Nutra-Mind: A brain tonic.

Nutra-Immune: For general good health of adults of all age group.

Nutra-Age: For general good health of the aged.

Nutra-Diab: For general good health of the diabetics.

Nutra-Pan-Ton: Pancreas tonic for diabetics.

Nutra-Card: A heart tonic.

Nutra-Speech: General good health and speech disorder therapy.