

## “We are shifting focus from sponsorship of projects to new models of Public-Private Partnership”

*Chemical Weekly* met up with Dr. Suman P.S. Khanuja, President MAPSI and Director, CIMAP, at the sidelines of 'BEAP 2007' to solicit his views on the essential oils industry and the potential for the industry in the global marketplace.

Excerpts from the interview:



### Could you elaborate on the status of research in tapping the potential of aromatic plants in India?

In aromatic plants, so far, research was focused on identifying what smells good, what can be used in perfumery or bring some fragrance to food or other items, as subsidiary to the main use in perfumery. Due to this, we now have plants like rose and mints — spearmint, peppermint, scotchmint, menthol mint etc., oils like lemongrass — to give a lemony flavour, citronella — to give fragrance of sanitising freshness to the environment and to repel insects and flies etc. Then you have geranium, which goes into products like mouth fresheners (*Pan Parag* etc.), in addition to its use in food for rose-type flavouring, as rose is expensive compared to geranium.

Research then shifted to why an oil smells good – the chemistry part. The constituents of oils have been researched and people are looking at what is favourable, so as to get a better price. Then came another aspect in research: there are many unfavourable components in an essential oil. These may be toxic or give a bad outcome to the final product. So people started working on these unfavourable components and ways to suppress them. These are areas where research is presently going on.

To support this, research is also going on in the agricultural component – cultivation, development of new varieties and genotypes that will give better yields and will be cultivable by farmers on a commercial scale.

### What policy initiatives are needed to promote aromatic plant R&D?

Research leads to technology, but technology does not happen unless you do basic research. There is, of course, applied research, but when you want to explore new ideas, you have a high chance of failure – 90% of the time you will not succeed. In these areas, funding needs to come in from the government, if we want to discover novel things that do not exist in the world. Trying to produce something that already exists at a lesser cost is not research, but only process optimisation.

What is required is innovation. For example, sandalwood is an expensive and rare resource. Why not explore the possibility of finding out some weed in the forest that smells like sandalwood. You are likely to fail, but if you succeed, you strike a goldmine. So innovation based research and exploration based research needs substantial funding.

In addition, to commercialise a technology, one needs marketing infrastructure support from the government. Not in the form of subsidies, as it would not help. One needs a basic structure where an entrepreneur can go to a particular site to sell his goods. So let there be a structured market

area, where a person can hire a space for a month or so. He would not need it for the whole year. It should come at a very reasonable cost.

For example in international trade fairs, if you give chance to entrepreneurs to have some space in a stall the government provides, they can sell their products and develop international clients. If we do these two things – support exploratory research and provide market infrastructure support – it would help immensely.

### What are the major gaps in our understanding of aromatic plant cultivation?

The major gap is that we have not optimised agro techniques. Agro techniques for a certain plant in Bangalore will be different from what is needed in Dehradun, because of temperature and other conditions being different. There could be a possibility that a particular crop can be grown in summer in Dehradun and in Bangalore in winter.

When we talk about aromatics, they are not going to be evaluated based on grain yield, root yield etc. They are going to be evaluated on the basis of molecules they produce. That will be very much dependant on environmental conditions at harvesting stage. So we need to define all of these precisely.

### How do you foresee growth in herbal products?

If we don't want to be notorious, which is a likelihood, we need to be quality based. We need to be precise in defining the quality of the product. We have to be careful in defining an herbal product, and not allow anything to be called herbal. At times, in spite of the fact that everything in a formulation is synthetic and some little herbal

ingredient is added, we call the product herbal. I prefer the term plant-based, as it implies the product is based on bio-actives, but has other ingredients, as well.

The major flaw today is that products coming into the market are quality tested both from a chemical point of view and also a biological activity point of view. Our claims, hence, have to be true to type. It should have the qualities we claim, in terms of chemical composition and biological activity.

If we become strict and have regulations on companies making herbal products to prove what they are claiming, we can become a leader in the business.

**Do we have enough regulations / safeguards in place to sustain the herbal product industry?**

It is unfortunate that we do not have the regulations we should on herbal products. We have regulations for food, drugs and cosmetics, but not for herbals. It is a necessity today and it should not be difficult. We already have agencies, which have been in this business, and it is only a question of extending the regulations to herbals.

**How is CIMAP positioned to address key concerns in natural product chemistry?**

We are a state-of-the-art institute, comparable to any world-class institute. As far as research and analysis is concerned, CIMAP can be the destination for anyone who is into natural products. We can define natural products and engineer them – both possibilities exist at CIMAP. We have capabilities of upscaling to a level industry would like to sell at and at economics that would beat other countries producing these products. One of the focus areas today is economising processes.

**What are your views on the government**

**initiatives in preserving and documenting indigenous plant base?**

There have been some very good initiatives. One of them is the Traditional Knowledge Digital Library (TKDL), a CSIR program in which CIMAP is a partner, along with more than 10 CSIR labs. We are converting the traditional knowledge of not just plants, but also practices and processes that have been followed and practiced in the past, into many local languages, in addition to Hindi and English. This will enable us to go for intellectual property protection of the

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knowledge that already exists. In the TKDL you will find not only turmeric, but *ajwain*, *saunf* and things like that. So this digital library is going to help. We are also creating a Central Bio-digital Library (CBDL), which will document the biodiversity that exists in India.

The National Innovation Foundation (NIF), an autonomous body based in Ahmedabad, is trying to link research organisations and grassroot level innovators who have traditional knowledge, and develop a package that can be commercialised. Efforts are now on, only these need to be strengthened.

**Where do you think India can lead in aromatic/herbal product developments?**

India should identify some plants as its brand equity. We can take the advantage of our bio-diversity and create brand equity for each state. If we do that we can get almost two dozen brand equities from India. Examples can be geranium from Uttaranchal, rose in Himachal, mint from

Uttar Pradesh, patchouli from Karnataka, lemongrass and *ashwagandha* from Andhra Pradesh and so on. These are the most suited conditions for them.

The advantage of this approach is that States will not compete with each other; they will rather develop along with each other. That is the way we would like to grow.

**How geared are we in extending the tools of biotechnology to aromatic/herbal plant cultivation?**

We are very well placed now. We are poised to make designer plants in aromatics. We already have units where we design them, not only using a transgenic approach, but even through genetic intervention and molecular breeding through which one can have better crops with respect to chemotypic quality.

In transgenics, India is poised to take the lead. As soon as regulatory issues in transgenics are solved, we will be in a position to translate them into products.

**How does CIMAP engage with industry to develop new products?**

There has been a major shift in our thinking of interaction with industry. In our last, i.e. Tenth Five Year Plan, we emphasised sponsorships and involvement even without investment, with just a commitment that they are interested in technology and we licensed them. In 2002 we had three technologies transferred to industry; in 2005-06 we had 10; and in 2006-07 we had 13. In 2007-08 we expect 15 such technology transfers. The shift we are trying to bring is partnership with the industry, right from the beginning, with investment to match. In fact, just today we had two clients who felt they would like to invest. We will prefer to set up Special Purpose Vehicles with industry, leading to development of products and its commercialization. CIMAP and industry will become partners.