NCL scientists develop rare technology

Swati Shinde | TNN

Pune: Scientists from the National Chemical Laboratory (NCL) here have developed the technology to convert bagasse into industrial raw materials such as cellulose and lactic acid that are used extensively in pharmaceutical, textile and food preservative industries. Based on the research done by the NCL scientists, country's first biorefinery has been set up in Karnataka by Godavari Sugar Mills Ltd (GSML).

NCL deputy director A. J. Varma, who headed this project, told TOI: "This is a state-of-the-art technology being introduced for the first time in India. At a time when petroleum resources are getting depleted, there's nothing like obtaining the same constituents from natural resources. The challenge now is to make it economical."

The cost of cellulose varies depending upon its application and the process involved in refining it. A lot of research is happening world-wide and a similar pilot plant was set up recently in the US, while there are reports of a Canadian firm setting up a plant in China.

Varma, who started working on the project in 2002, added: "materials like cellulose and lactic acid, which are obtained mostly from oil refineries, can also be developed from plants. And if these constituents are used in production of plastic it can become more environment friendly."

The pilot plant set up at Sameerwadi in Karnataka is at a preliminary stage and the GSML has plans to produce up to 5,000 tonnes of cellulose in the coming years. Once the marketing aspect is worked out, the production will be scaled up.

Another aspect of the project was deriving lactic acid, which is widely used in food preservatives. Said NCL scientist

Sanjay Nene: "Our main concern today is to produce bio-degradable products — out of sugarcane waste which is abundant in the country. The biggest advantage of obtaining lactic acid in a natural way is that it will reduce pollution."

According to NCL deputy director A J Varma, who headed the project, at a time when petroleum resources are getting depleted, there's nothing like obtaining the same constituents from natural resources. The challenge now is to make it economical

Lactic acid is mostly used in varnishes, acid paints and electronic material, to name a few. At present is imported to the country The biorefinery is expected to produce 300 tonnes of lactic acid yearly.

India is the second-largest producer of sugarcane in the world, and nearly one-third of all sugarcane ends up as bagasse, which is often burned by sugar mills as a source of energy and also as feedstock for producing bioethanol. Producing cellulose from bagasse involves a cycle wherein separation of long chains of sugar molecules and its lignin is done. The scientists have perfected a steam treatment which gives nearly 90 per cent pure cellulose. Chemical treatment is needed for further purification.

D. V. Gokhale, another scientist involved in the project, said: "At present the constituents obtained are not quite cost-effective. We have a challenge in front of us to make it less expensive. However, the positive side is that we have developed a technology to obtain environment-friendly materials."