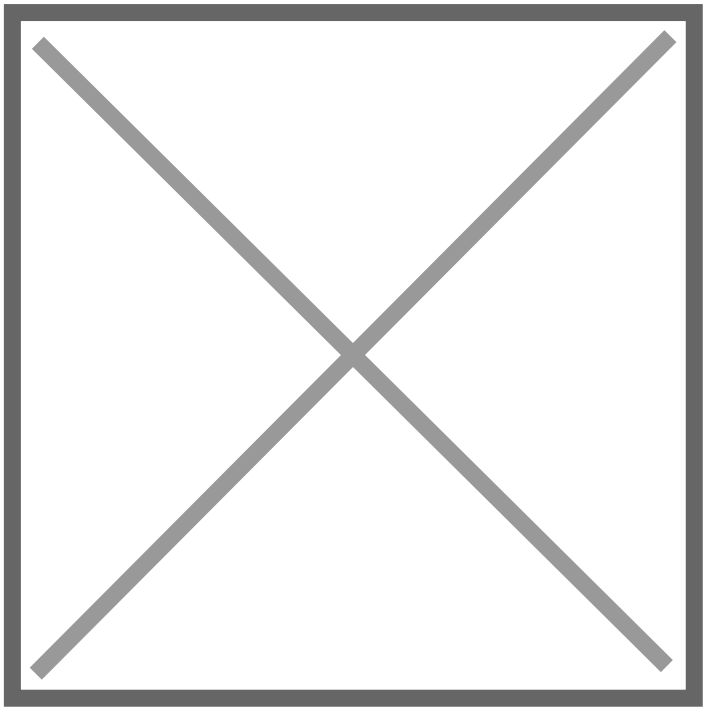


Stay away from GM medicinal plants

11 May 2004 | News



Genetically modified medicinal plants are an ill-advised move.

It has been reported that Jamia Hamdard's biotechnology centre has been given a grant by the government to develop genetically modified medicinal plants. This ill-advised move should be reversed immediately and the project stopped. Medicinal plants produce very special chemicals under certain specific conditions. These chemicals in the form of alkaloids or essential oils are usually the active principle in the plant, in other words, that compound or compounds which has the healing property associated with that particular plant. The efforts to broaden the base of medicinal plants that can be accessed for commercialisation on a large scale has led to the development of cultivation methodologies for medicinal plants that have been traditionally collected from the wild.

Suman Sahai

It is not surprising that developing cultivation packages have so far met with limited success. In fact, given the amount of money that the government is spending on this, the results are quite modest. Traditional Vaids and Hakims are in fact quite sceptical of the efficacy of cultivated sources of medicinal plants and advocate the use of medicinal plants from nature for effective cures. An important aspect of cultivation is to ensure that these medicinal plants are grown in conditions mimicking their natural habitats to the extent possible. It stands to reason that no agrochemicals are to be used, neither fertilisers nor pesticides. The reason for this is to create cultivation conditions similar to those under which the plant is provoked to produce these special chemicals in nature. Most of these chemicals are produced in response to environmental stress. For example, the agar tree produces the fragrant agar resin (used in agarbattis and the perfume industry) in response to a fungal infection.

The impact of even the natural environment is acutely registered by the medicinal plant and influences the amount and potency of the active principle it produces under the given conditions. It is known for example, that populations of a particular

medicinal plant from different parts of the country (and therefore from different habitats) have differing "medicinal value". Some are considered better than others and are more sought after. All these facts should help to make clear that medicinal plants cannot be "tampered" with if they are to retain their medicinal properties and remain effective constituents of treatment by the Indian Systems of Medicine (ISM).

There is an abundance of studies being done on the impact of genetic transformation on the metabolism of a transgenic plant. All evidence points to the fact that metabolic changes can and do happen. The fear that allergens and toxins may be produced by the novel gene combinations resulting from the insertion of foreign genes into the germplasm of a plant, have led to the establishment of sophisticated protocols for testing food safety before a GM crop can be released for human use. The famous case of a GM corn, Starlink, produced in the US should be remembered for the fact that allergens can be produced in GM crops, the natural versions of which did not have any allergens. The genetically modified Starlink corn was found to contain an allergen and was therefore not approved for use as human food. A potentially life threatening allergenic property was found in a GM soybean variety bred by using a gene from the Brazil nut. Fortunately, this was detected in time, before harm could be done and the GM Soya was withdrawn.

The outcome of putting in a radically different gene (from a completely different species) into a plant to create a GM plant remains uncertain largely because at the present level of the science, almost nothing is understood about the process of genetic transformation. The scientists cannot control where the new gene will go and sit on the chromosomes of the receiving plant, nor can they control whether one copy or 50 copies of the gene will be integrated into it. All this makes the process of genetic transformation a purely random event, the impact of which cannot really be predicted. In the case of non-edible cash crops like Bt cotton, something going wrong means a crop failure. In the case of food crops, it could have potentially harmful, even lethal effects for humans. In the case of medicinal plants, which have chemicals that heal but which could be considered dangerous in the wrong hands, the impact could be either that the plants lose the medicinal property or produce something unanticipated, which could have harmful effects.

The news therefore that there is a project to genetically modify medicinal plants is disturbing. It reflects the mindless way in which the Department of Biotechnology (DBT) is promoting GM research, without any regard for relevance, appropriateness or even plain common sense. The DBT's recently retired secretary, now appointed as Advisor in the same department, is on record for famously insisting that India does not need a biotechnology policy, when practically every past and present luminary of the scientific establishment has expressed concern at the lack of such a policy. Well, this project is the result of working without a policy. There seems to be neither logic nor purpose in a project on GM medicinal plants nor in many other research projects promoted by the DBT. The DBT dispenses the taxpayer's money for research and the taxpayer has a right to help set priorities for GM research funded with its money. Personal whims for climbing on to the GM bandwagon and indulging a "Me-too" fascination on the part of a handful of people in the scientific establishment cannot substitute for a national policy on biotechnology, particularly genetically modified crops. India needs a sane and focussed policy for GM crops that should be developed after a national level stakeholder discussion.

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