

National Seminar on Innovative Approaches in Biosciences

Proceeding



In collaboration with

**Indian Science Congress Association
(ISCA), Jaipur Chapter**

and

**National Bank for Agriculture and Rural Development
(NABARD)**



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Kanoria PG Mahila Mahavidyalaya
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Organized by :

Department of Biotechnology, Botany and Zoology
Kanoria PG Mahila Mahavidyalaya,
JLN Marg, Jaipur – 302015 (Rajasthan)

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SUSTAINABLE USE OF PLANT GENETIC RESOURCES BY INDIGENOUS PEOPLE

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Abstract

The indigenous people possess enormous knowledge about the sustainable use of plant species available to them in their native lands. They derive very basic needs for survival from the plants i.e. food (leaves, fruits, tubers, nuts, etc.) for themselves, fodder for the livestock, fuel for cooking, fibres for clothing, timber, rope, bark, bamboo and grasses for housing and farming, medicinal herbs for health care and diverse goods like gums, resins, waxes and silkworm cocoons for their economy. In turn, they protect the forests, conserve its biodiversity and also enrich its fertility through their various cultural activities, beliefs and practices. Over 9500 wild plant species used by Indian indigenous people for meeting their varied requirements have been recorded so far. Plants are conserved in abandoned sites of shifting agriculture and also in sacred groves as in situ conservation of biodiversity and ecological restoration by the indigenous people. The indigenous culture has provided several miracle plants of immense food and medicinal value to the modern civilization. The primitive cultivars and wild relatives of crop plants preserved by the indigenous people may hold the genetic key of many valuable miracle crops of the future.

Keywords: Indigenous people, Sustainable, Biodiversity

Introduction

Biodiversity is one of the most important capital assets of the country. The rich and varied biodiversity of India is the greatest strength and is the bedrock for bio-industrial development. The rich biodiversity of India is also matched with an equally rich cultural diversity and indigenous knowledge systems particularly in food and health care traditions. The indigenous people of India are called tribes. The Indian subcontinent is inhabited by over 53 million tribes belonging to over 573 indigenous communities of 227 ethnic groups. They comprise nearly 22 percent of the world's indigenous people (Pushpgandhan, 1994). The manner in which the indigenous people manipulate biodiversity for ecosystem functional integrity, and through that for their own social function is interesting. Plants, animals, trees, rivers, ponds, lakes, hills, stones and mountains

are all considered sacred. Nature worship is a tribal belief and all creations of nature have to be protected. Such tribal beliefs have preserved several virgin forests in pristine form called sacred groves (the forest of God and Goddesses) (Vartak, 1996).

Over 9500 wild plant species used by Indian indigenous people for meeting their varied requirements have been recorded so far. Out of 7500 wild plant species used by the indigenous people for medicinal purposes, about 950 are found to be new claims and worthy of scientific investigations. Out of 3900 or more wild plant species used as food by indigenous people, about 800 are new information and at least 250 from them are worthy of being developed as alternative source of nutritive food that the civilization would need in the near future (Zeven and Zhukovsky, 1973). Out of over 525 wild plant species used by the

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indigenous people for making cordage and fibre, five are useful for commercial exploitation. Out of 400 plant species used as fodder, 100 are worth recommending for wider use. The indigenous people of India have also been using about 300 wild plant species as pesticides and piscicides of which at least 175 are quite promising to be developed as safe biopesticides (Arora, 1991).

The traditional knowledge and resource management practices of the indigenous people should be applied in modern development strategies. Biotechnology uses traditional knowledge of the indigenous people with modern tools of genetic engineering to get the desired results from bioprospecting of biodiversity to get new sources of food and medicine (Anon, 1991). The knowledge of the indigenous people must also be covered under 'Intellectual Property Right'. Human selection is as much responsible for creating genetic variability in economic plants as natural selection, and the indigenous people have played a critical role. The products of indigenous knowledge, name'y 'folk varieties', 'land races' and genetic diversity at the intra-specific level provide the basic raw material for modern plant breeding and biotechnology programme (Anon, 1998).

Observations and Discussion

Following observations have been recorded for the role of ethnic and indigenous people in conservation of biodiversity.

I. Conservation and use of medicinal plants by the Indigenous people of India

Indigenous people of India used several kinds of medicinal plants like *Rauwolfia serpentina* (sarpgandha), *Papaver somniferum* (opium) and *Cinchona officinalis* (quinine) to treat various diseases. The Todas, Kotas, Irulas and Kurumbas of the Southern Western ghats use and have preserved *Plantago erosa* (chitrak), *Solanum anguivi* (forest

bitterberry), *Passiflora edulis* (passion fruit), *Chenopodium ambrosoides* (wormseed) and *Centella asiatica* (brahmi) as herbal medicines. Korwas, Baigas and Bhils of Chhotanagpur and central highlands commonly use medicinal plants like *Andrographis paniculata* (kirayat), *Asparagus racemosus* (satavari), *Crotalaria alata* (rattlepod), *Scoparia dulcis* (licorice weed), *Cleome gynandra* (spiderwisp) and *Urginia indica* (Indian squill). The Nicobarese and Jarwas of Andaman and Nicobar Islands exploit wild plants extensively for healthcare. Some of them are *Donax cannaeformis* (aratan), *Heranadia peltata* (lantern tree) and *Wadelia biflora* (beach sunflower). The Mikirs of Assam commonly use *Costus speciosus* (canereed), *Crinum amoenum* (poison bulb), *Floscopa scandans* (climbing flower cup), *Leucas lavandulaefolia* (drone pushpi) as medicinal herbs.

II. Conservation of crop plant genetic resources by the indigenous people of India

The Indian gene centre of Chottanagpur plateau in Bihar is dominated by tribes like Santhals, Munda, Oraon, Asurs and Birhor which maintain amazing variability in forms of *Oryza landraces*. Maize is another important crop of northeast India and there is rich genetic variability of maize. The indigenous people of northeast India grow over 15 landraces variability. The central and peninsular India hold rich genetic diversity in foxtail millet, *Panicum sumatrense* (little millet), *Pennisetum typhoides* (pearl millet), *Eleusine coracana* (finger millet) and *Sorghum*. Legumes exhibit wide diversity in northeast India and are preserved by the indigenous people. Among the 200 odd species of legumes which are found in this region, species like *Canavalia* (jack

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bean), *Mucuna* (velvet bean), *Psophocarpus* (winged bean) and *Vigna* (mung) are used in their daily diets (Arora 1997).

III. **Wild fruits, seed, corm and tuber plants conserved and used as food by the indigenous people**

- a) **Wild fruits:** *Bridelia crenulata* (spinous kino tree), *Carissa carandas* (karonda), *Clausena heptaphylla* (Jonglakati), *Cordia oblique* (clammy cherry), *Memecylon edule* (anjani) and *Premna tomentosa* (woolly-leaved fire-brand teak).
- b) **Wild seeds:** *Cycas circinalis* (queen sago), *Dolichos trilobus* (sickle bean), *Entada pursaetha* (sea bean) and *Xylocarpus xylocarpa* (Burma ironwood).
- c) **Wild pods:** *Lablab purpureus* (lablab bean)
- d) **Wild leaves:** *Canajera rheedii* (false olive), *Cassia tora* (sickle senna), *Desmodium triflorum* (black clover) and *Hibiscus furcatus* (wild hibiscus).
- e) **Wild tubers:** *Dioscorea alata* (purple yam) *Dioscorea bulbifera* (air potato), *Dioscorea oppositifolia* (Chinese yam), *Dioscorea pentaphylla* (five leaf yam) and *Dioscorea tomentosa* (yam).
- f) **Wild corms:** *Colocasia esculenta* (taro)
- g) **Wild rhizomes:** *Canna indica* (Indian shot). (Jain, 1996)

IV. **Wild plant species used as green manure and pesticides by the indigenous people of India**

Several useful wild plants are used by the ethnic people as green manure and to eradicate pests from their fields. Species used as pest repellent are *Calotropis gigantea* (giant milkweed), *Pongamia*

pinnata (karanj), *Chloroxylon swietenia* (Ceylon satinwood) and *Azadirachta indica* (neem); those used as green manure are *Cassia javanica* (pink shower) and *Tephrosia purpurea* (fish poison).

Conclusion

The indigenous people have helped to conserve unique biodiversity which has come as great ecological legacy to the modern civilization. Several samples of rare cultivars collected from tribal belts of India are deposited in the National Bureau of Plant Genetic Resources (NBPGR) New Delhi. It is amazing that these poor and illiterate men and women had such a sense of conservation of biodiversity and know its importance thousands of years ago, which the modern environmental scientists are realizing today. Some of the genetic resources especially those of food and medicinal crop plants conserved by the Indian indigenous people have proved highly valuable in improving the quality of human life and contributing to agricultural growth and economy.

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