Uses of some threatened and potential ethnomedicinal plants among the tribals of Uttar Pradesh and Uttrakhand in India

Anand Prakash
Ethnobotany and Ecology Division
National Botanical Research Institute, Lucknow. Uttar Pradesh-226001 (India)
E.mail: pranand_1@sify.com

Introduction

The Convention on Biological Diversity (C.B.D) recognizes the sovereign right of each country over their biodiversity. It is therefore necessary for both the developing and developed countries to strengthen their scientific capabilities to ensure this sovereignty. The knowledge of flora and vegetation of any country is essentially required for proper documentation, evaluation of biodiversity's wealth, prioritization of threatened plant species and their conservation for future sustainable utilization in human welfare. Further, in order to monitor and manage the biodiversity, a systemic and thorough knowledge of the structural and functional aspects of various ecosystems is also highly required.

India has a very rich biodiversity, unique physical and ethnic diversity, traditional culture, and much indigenous knowledge or tribal wisdom (Rao 1989, 1994). There are ca.500 tribal and aboriginal communities in India living in close proximity to forests since time immemorial. Due to the close and long association with forests they have acquired tremendous knowledge of plants, plant produce and their uses in their daily needs and health care. (Ambasta, 1986; Maheshwari *et al.* 1981, 1986; Dhawan *et al.* 1977; Singh *et al.* 1984; Singh *et al.*1994; Singh & Prakash 1994, 1996; Jain 1975, 1991; Jain & Puri 1984; Singh 1997; Prakash & Singh 2000).

In recent years, the habitat loss due to developmental programmes, overgrazing, animal husbandry and tourism has resulted in the loss of biodiversity. Natural causes such as floods, earthquakes and landslides also add to this tragedy. Many species are extinct or on the verge of extinction before they are known for their uses (Biswas 1998; Goel 1992; Prakash & Singh 2001). It is estimated that about 25,000 plant species are on the verge of extinction through out the world (Jain & Sastry 1980). In order to categorize and update the list of threatened species, the International Union for Conservation of Nature and Natural Resources (IUCN) has recognized the categories on the basis of geographical range, populations and fragmentations of populations. The earlier categories, Extinct, Endangered, Vulnerable and Rare, have been superseded by the categories as Extinct (EX.), Extinct in the Wild (EW), Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Conservation Dependent (CD), Data Deficient (DD), Low Risk (LR), Not Evaluated (NE) (Nayar 1996). Jain and Sastry (1980) reported 135 species as being rare and threatened in Indian flora. The native communities, with their unique traditional cultures and indigenous knowledge are also depleting gradually due to modernization, urbanization, industrialization and other socio-economic developmental programmes for the upliftment of life and economy, worldwide. The indigenous knowledge (IK) or local knowledge is empirical knowledge of a community relating to all

Table 1 : Useful threatened plants in state of Uttar Pradesh and Uttrakhand

Name of the Plants	Family	Local Names	Locality	Tribe	Uses	Distribution	Status of Rarity
Acorus calamus L.	Araceae	Bach, Bal, Ghorbach	Jaunsar, Kheri, Sonbhadra	Jaunsari, Tharu, Gond	For curing bronchitis, cough and cold and diarrhea. As antidote for snakebite.	In marshy places, wild, throughout India, ascending the Himalaya to 2500 m., in Sikkim, north temperate and warm region. Sri Lanka, Europe and North America.	The plant is vulnerable (VU)
Asparagus adscendens Roxb.	Liliaceae	Satavar	Gorakhpur, Sonbhadra, Varanasi	Tharu, Gond, Kol	To women which increases secretion of milk. The decoction of the root mixed with decoction of *Bombax ceiba* is used for sexual strength and vigour.	Sal forests of terai region of Uttar Pradesh, Western Himalaya from Kumaon eastwards to Hazara extending to Affghanistan, Decan Peninsula.	The plant is vulnerable (VU) in Uttar Pradesh
Berberis aristata DC.	Berberidaceae	Chitra, Daruhald, Rasaut, Kashmol	Garhwal, Pithrogarh	Garhwali, Bhotia	In the treat-ment of snakebite, Ophthalmic diseases and Blood pressure.	Temperate Himalaya attitude 2500-4000 m. from Bhutan to W. Himalaya, Nilgiri and Sri Lanka attitude 2500-3000 m.	The plant is endangered (EN) in Uttrakhand
B. lycium Royle	Berberidaceae	Kashmoee	Jaunsar	Jaunsari	As eye drops in eye inflammation. In skin diseases and diabetes.	Dry valleys of the Himalaya, alt. 1300-3000 m.; from Bhutan to W. Himalaya, Bihar on Parasnath, alt. 1450m. Edgeworth, Afghanistan	The plant is endangered (EN) in Uttrakhand
Celastrus paniculatus Willd.	Celastraceae	Umjan, Mujhani, Malkangani, Kakundan	Sonbhadra, Varanasi, Nainital, Kheri;	Gond, Kol, Tharu	for the treatment of tumour cancer, for treating rheumatism and gout. Seed oil is massaged on joint pain.	Occurs in Dehra Dun subtropical Himalayas up to 1600 m; and in the Hill parts of India from Punjab eastward and south, SriLanka.	The plant is critically endangered (CR) in Uttar Pradesh and Uttrakhand.
Chlorophytum tuberosum Bak.	Liliaceae	Safed Musli	Gorakhpur;	Tharu	for maintaining sexual strength and vitality.	Sal forests of terai region of Uttar Pradesh. Bihar, Bengal, Madhya Pradesh and South India; also in Myanmar, extending in tropics.	The plant is critically endangered (CR) in Uttar Pradesh

Drimia indica L.	Liliaceae	Ban Piyaz	Varanasi	Kol	For abortion	Plains of Uttar Pradesh. On rocky soil, more or less throughout India.	The plant is critically endangered (CR) in Uttar Pradesh and Utttakhand.
Euphorbia fusiformis Buch.-Ham. ex D. Don	Euphorbiaceae	Banmuli	Gorakhpur, Bahraich, Kheri	Tharu	In paralysis, for the treatment of rheumatism and gout.	W. Himalaya foothills	The plant is critically endangered (CR).
Gloriosa superba L.	Liliaceae	Karihari, Kalihari	Varanasi, Gorakhpur, Pithrogarh	Kol, Tharu, Bhotia	In rheumatism and gout..	Uttar Pradesh, along the sub-Himalayan tracts of Rohilkhand and Terai region, usually in outskirts of forests also in Bundelkhand and Marwara, Bihar and Madhya Pradesh etc. Mostly in tropical parts of India.	The plant is critically endangered (CR) in Uttar Pradesh and Uttrakhand.
Gymnema sylvestre (Retz.) Schult	Asclepia-daceae	Gurmar	Varanasi Sonbhadra	Kol	in the treatment of diabetes.	Bundelkhand, Saharanpur, dry hills in Uttar Pradesh, S. India, extending tropical Africa, Malaysia, Asia.	The plant is vulnerable (VU).
Hedychium spicatum Buch.-Ham	Zingibe-raceae	Kapoor-kachri	Pithoragarh	Bhotia	Used as anti-inflammatory	Subtropical region of Western Himalaya, Nepal.	The plant is vulnerable (VU) in Uttaranchal
Helmintho-stachys zeylanica Hook.f.	Ophio-glosaceae	Kamraj;	Gorakhpur	Tharu	given in spermatorrhoea and to improve memory.	More or less through-out India but extremely rare. Occur rarely in the Sal forest of Terai region of Uttar Pradesh, Madhya Pradesh etc.	The plant is critically endangered (CR)
Hemides-mus indicus (L.) R. Br	Asclepia-daceae	Chher-dudhiya, Padhin, Kapoori;	Sonbhadra Varanasi	Gond, Kol	For the treatment of diabetes. Given orally as an antidote to snake bite.	Forest of Uttar Pradesh, Madhya Pradesh, Bihar eastwards to Bengal and the Sundarbans to South India and Sri Lanka.	The plant is vulnerable (VU).
Perilla frutescens (L.) Britt.	Lamiaceae	Bhanjiri	Jaunsar	Jaunsari	Seed oil is massaged twice a day in arthritis for a long time.	Western Himalaya, extending up to 2500 m. Sikkim, Arunanchal Pradesh	The plant is vulnerable (VU) locally in Uttar Pradesh and Uttrakhand.
Piper longum L.	Piperaceae	Peeper, Farpiper	Nainital, Kheri;	Tharu	The ripe fruit powder mixed with honey is given for cough and cold. Root powdered for headache.	Wild in terai region of Himalaya and cultivated at some places of India	The plant is endangered (EN) in Uttar

Pygmeo-premna herbacea (Roxb.) Mold.	Verbenaceae	Gathiyavad, Bhant, Gathiavat	Varanasi, Kheri	Kol, Tharu	The paste of the whole plant is made into pills and given three times a day for fifteen days for the treatment of rheumatism and gout. Warm root paste is applied externally for the treatment of rheumatoid arthritis and gout.	Subtropical Himalaya from Kumaon east to Assam extending South through W. Bengal, Bihar, Orissa into the Deccan Peninsula	The plant is critically endangered (CR) in forest area due to illegal grazing.
Rauvolfia serpentina (L.) Benth. ex Kurz	Apocyna-caeae	Jhabar barua, Chhota-chand, Sarpa-gandha	Kheri, Nainital	Tharu, Bhoxa	The extract of the root is given two times for three days to cure fever and blood pressure	More or less throughout the hotter parts of India, Pakistan, SriLanka, Myanmar, Malaysia and Thailand.	The plant is vulnerable (VU) in Uttar Pradesh and Uttrakhand
Andro-graphis paniculata (Burm.) Wall. ex Nees	Acantha-ceae	Kirayat Kalmegh	Gorakhpur, Varanasi	Tharu	Used as tonic, Influenza, bronchitis, Decoction is used in jaundice.	In waste cultivated in gardens places, more or less throughout India	The plant is vulnerable (VU) in Uttar Pradesh.
Costus specious (Koenig ex Retz.) Smith	Zingi-beraceae	Kewa	Kheri, Gorakhpur	Tharu	Rhizomes are cooked and eaten, used as tonic, in fever etc.	Sal forest of Uttar Pradesh, Madhya Pradesh, Bihar and Orissa, more or less throughout India, Indomalaysia.	The plant is endangered (EN) in Uttar Pradesh
Dioscorea deltoidea Wall. ex kunth	Diosco-riaceae	Gun, Kithi	Jaunsar	Jaunsari	Used in rheumatic and ophthalmic diseases as a oral contraceptive	Western Himalaya	The plant is endangered (EN) in Uttrakhand

activities ranging from land use and natural resources use, to management and other activities associated with the life sustainable process. The ethnomedicinal plant wisdom as a part of indigenous knowledge plays a vital role in the primary healthcare of the native communities. It has the potential for isolation of safe and effective drugs and for sustainable utilization of ethnomedicinal plant genetic resources (PGR) and their conservation is highly needed.

Materials and methods

The indigenous communities, Kols, Kharwars, Gonds,Bhoxas, Tharus, and Jaunsari were surveyed in different seasons. The information on uses of threatened ethno-medicinal plants was gathered with the help of local people, knowledgeable and experienced traditional healers and practitioners and confirmed through visits to different localities recorded. The voucher specimens are collected and deposited in the herbarium of National Botanical Research Institute, Lucknow (LWG).

Results

The potential uses of the threatened ethnomedicinal plants as claimed and practiced by

Some Useful Threatened Plants

Acorus calamus: A useful ethnomedicinal plants for curing bronchitis, cough, and cold

Celastrus paniculatus: Useful in the treatment of tumor cancer, rheumatism and

Helminthostachys zeylanica: A potential ethno medicinal plants used in spermatorhoea and for improving memory.

Costus speciosus: Used as food.

Hemidesmus indicus: An important ethnomedicinal plants used in Diabetes among the tribals.

Curculigo orchioides : A potential ethno medicinal plants used as sexual tonic and improving impotency.

Rauvolfia serpentina: A useful ethnomedicinal plant to cure fever.

Rauvolfia serpentina: A useful ethnomedicinal plant to cure fever.

the tribals are arranged alphabetically giving information on local names (Ln.), family, locality (Loc.), tribal, mode of administration, distribution (Distb.) in tabular form. Distributions of the species have been provided on the basis of literature published earlier. The status of rarity (Hooker, J.D. *et al.* 1872-97) is categorized based on our own observations and the IUCN Red List Criteria. (Table 1)

Discussions and conclusions

The resurgence of interest in green medicine is due to many reasons that the number of diseases and disorders are increasing day by day and prices spent

on medicines are also increasing. Even some diseases like asthma, cancer, diabetes, epilepsy, filaria, jaundice, rheumatism, gout and arthritis are still incurable in allopathic systems of medicine. The loss of biodiversity resulting in extinction of many useful species has also posed a serious concern to the global medical scientists and researchers.

With this point of view medicinal plants have become one of the main concerns of the world conservation organizations. Systematically more attempts to study and document the medicinal plants of the Indian sub continent are seriously needed. There is also a need to establish herbal drug centers for collecting, processing and preparation of ethno-medicine and to develop cultivation, farming and documentation of potential and promising ethnomedicinal plants in social forestry operation for improving the life and economy of the local tribal and rural peoples. The establishment of some more wild life sanctuaries, national parks and biosphere reserves in botanical rich areas and hot spots are also required for the protection and conservation of valuable biodiversity.

Therefore, there is urgent need to document complete biodiversity, prioritize useful threatened plants, and conserve them *in-situ* and *ex-situ* for sustainable utilization in health care and human welfare.

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