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Collection of Indigenous Knowledge and Identification of Endangered Medicinal Plants by Questionnaire Survey in Barind Tract of Bangladesh

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Abstract: This paper deals with over one hundred plants of ethnobotanical importance, used by the village doctors especially village kaviraj of Barind Tract for medicinal purposes. This work aims at the preservation and perpetuation of this knowledge of the local plants possessing medicinal properties for the benefit and further fruitful investigation on modern scientific lines and also identification of endangered medicinal plants by questionnaire survey. The data presented in this paper has been collected by personal contact with the local people and herbal practitioners, obtaining the information with great difficulty because of their reticence in divulging the secret of the identity of plants of great traditional reputation.

Key words: Ethnobotany, barind tract, medicinal plants

INTRODUCTION

The Barind Tract is spread over parts of greater districts of Rajshahi, Dinajpur, Rangpur and Bogra of Bangladesh and the Malda districts of West Bengal. The Barind encompasses an area of 3.364 square miles of Bangladesh. The hard red soil of Barind Tract is distinguished from other parts of the country. Comparatively high temperature prevails in the Barind area during summer. The wet season in the area extends from mid-June to October and November to February is dry and cool period with almost no rains. The Rajshahi Barind tract is located between $24^{\circ}23'$ to $25^{\circ}15'$ north latitude and $88^{\circ}2'$ to $88^{\circ}57'$ east longitude. Rain fall in the area varies from about 1500 to 2000 mm and temperature varies from 8 to 44°C .

Bangladesh have a rich heritage of herbal medicine amongst the countries of South East Asia. In rural Bangladesh and among a considerable proportion of population comprising the tribal living in remote forest areas, this has been the mainstay of the therapeutic arsenal until the early part of the present century. Over the centuries, people here have depended on the nature around them and through trial and error, have learned the special priorities of the plants in their environment. In general, practice of administering has been to combine a number of medicinal plants or their products into formulae. Huge quantities of plant materials and extracts are imported for the manufacture of Ayurvedic, Unani and Homeopathic Medicines (Chatterjee *et al.*, 2000). Making health cure and medical facilities available to the people is now a major concern of a large number of

countries (Ghani, 2000). Due to the toxic and adverse reactions of synthetic and chemical medicines being observed round the globe herbal medicine has made a come back to improving the fulfillment of our present and future health needs. Religious-cultural faith, weak economy in accessibility and consequently lack of modern medicinal facilities in these villages seems to be the cause of dependence on these medicinal plant species in addition to their proven ameliorative effects (Sugandi, 2000). Methyl ester of aristolic acid, a pure compound isolated from the roots of *Aristolochia indica* Linn. was found to exert 100% abortifacient activity at a single oral dose of 60 mg kg^{-1} b. wt. when administered on 6th or 7th day of pregnancy; 20 and 25% abortifacient effect were observed at the same dose on day (Shaha, 1978).

In the ancient time most of the people were depended on plants as remedy of disease. Still now some of the patients in Bangladesh including Barind Tract take medicine in the form of Ayurvedic and Unani formulation which are derived from plants. In many cases plants or their anatomical parts are taken directly as extract, secretions etc. In Bangladesh most of the medicinal plants for Ayurveda can not meet the demand. The situation is compounded by the depletion of local resources due to habitat degradation, unsustainable harvesting in an optimal way. If the present situation is continued in course of time the important medicinal plants will be extinct from the environment. Making health care and medical facilities available to the people is now a major concern of a large number of countries (Ghani, 2000). Due to the toxic and adverse reactions of synthetic and chemical medicines being observed round the globe

herbal medicine has made a come back to improving the fulfillment of our present and future health needs. The present work was intended to evaluate the occurrence of the indigenous medicinal plants and folk medicinal treatments having been used in several areas in Rajshahi, Naogaon and Nawabganj district including Barind tract (Sugandhi, 2000).

The villagers and also village doctor of this region are rich in ethnobotanical knowledge owing to their close affinity with the surrounding natural resources. They have strong faith and belief in traditional health care systems in which alpine and sub alpine medicinal plants play an important role. Religious-cultural faith, weak economy in accessibility and consequently lack of modern medicinal facilities in these villages seems to be the cause of dependence on these medicinal plant species in addition to their proven ameliorative effects.

MATERIALS AND METHODS

In the present investigation four sites were selected for survey. They are denoted 1,2,3,4. Paba and Durgapur Upazilla in Rajshahi district are considered to be a site 1. Godagari and Tanore Upazilla in Rajshahi district are

considered to be a site 2. Mohanpur Upazilla in Rajshahi district and Naogaon Sadar Upazilla in Naogaon district are considered to be a site 3 and Chapi Nawabganj Sadar and Sibganj Upazilla in Chapi Nawabganj district are considered to be a site 4. All the relevant materials were thoroughly studied before going into the field. The questionnaires were designed for collection of ethnobotanical and socio-economic data. The study was conducted in March 2003. Physical survey of the Barind region was conducted during which plants were collected, dried and pressed properly. The following tools were used during collection: a) Knife; b) Seizer; c) Polythene bags; d) Tag. Tag with local name was attached with each plant. Plants were collected as systemically as possible from the selected area. The entire plants as far as possible with their flowers and fruits were collected and took photo/snap. In the field note books collection number, date of collection, locality, habit, habitat, flower colour and other characters which were not found after preparing herbarium or preservation of flower were recorded, if the flowers and fruits were not possible to collect with their vegetation body, they were collected separately. The same materials presented in different place were also collected to observe where there was any variation due to

Ethnobotanical and socio-economic documentation data sheet

A . General information

Name: _____ Date:-----
 Father's / husband's Name: _____
 Village/para: _____ Holding no.: _____ Union: _____ Thana/Upazila: _____ Dist: _____
 Age: _____ Sex: _____ Profession: _____
 Family member No.: _____ Male: _____ Female: _____ Young: _____ Adult: _____

B. Social information:

Name of the Tribe: _____ Density/population: _____ Education: _____
 Linguistic: _____ Religion: _____
 Health care by whom: _____ Self / Medicine men: _____
 Economical Condition: _____ Source of income: _____
 Method: _____ Treatment Area: _____
 Name of disease: _____
 Fees: _____ Number of patients (per week) _____

C. Botanical information

Name of plant scientific name family	Collection No.	Size of plant population (Availability)*	Cause	Habit	Habitat	Insert	Parts of plant used	How used (In amount/dose)	In which used

* Extinct (Ex), Endangered (E), Vulnerable (V), Rare(R), Indeterminate(I), Out of Danger(O), Not threatened (nt) Available (A), More Available(M), Most Available (Mo),

Source (wild/cultivated)	Mode of propagation	Need of domestication	Need of conservation If yes, why?	Scope of conservation If yes, why?	Mode of preservation /storage:	Ritual/ taboos	Folklore and beliefs	As suggested by them/ comment

different ecological condition. The questionnaires were designed for collection of information by following ethnobotanical and socio-economic document data sheet.

The original Red Data categories used by the World conservation Monitoring centre (WCMC) and the Species Survival Commission (SSC) of IUCN the World Conservation union to indicate the degree of threat to individual taxa in their wild habitats. Below are the formation definitions of the categories. Note: There is a degree of subjectivity to the application of these categories, a subjectivity that will be diminished by a thorough understanding of a strict adherence to these definitions.

Extinct (Ex): Taxa that are longer known to exist in the wild after repeated searches of the type localities and other known or likely.

Endangered (E): Taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating. Included are taxa whose numbers have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to be in immediate danger of extinction.

Vulnerable (V): Taxa believed likely to move into the endangered category in the near future if the causal factors continue operating. Included are taxa of which most or all the populations are decreasing because of over-exploitation, extensive destruction of habitat or other environmental disturbance.

Available (A): Taxa are not an endangered categories in the near future. They are found available in surrounding and have no any difficulties for their propagation.

More available (M): Taxa are found available in surrounding and have no any difficulties for their propagation but their densities are higher than of other categories.

Most available (MO): Taxa are found available in surrounding and have no any difficulties for their propagation but their densities are highest of above categories.

The relevant information was collected through interviewing and filling questionnaires from 200 herbal doctors and tribes. The information was then compared with each other and people of other villages were told to share and add their experiences in order to identification of endangered medicinal plants. After making the collection, the next step in taxonomic procedure is identification. The collected plants were identified comparing the herbarium sheets preserved in Rajshahi university herbarium. The collected plant specimen was also identified by with the help of the following books and journal (Prain 1963). In some cases Lawrence (1953), Khan (1975), Heywood, V.H. (1979). Biswas, K. (1950), etc. were consulted. For the current and up to date nomenclature "name changes in Bangladesh Angiosperms" Huq (1986) and Pasha (1988) were consulted. For medicinal information Ghani (1998), Kirtikar (1987) were consulted.

RESULTS AND DISCUSSION

Ethnobiologically a total of 100 plant species were reported to be used by these people. Wild plant species used for edible/food purpose by the people, medicinal plant species or more were reported to be used by the local people in traditional health cure system to cure major ailments (ie. fever, headache, rheumatism, diarrhoea, teething, stomach pain, wounds and boils, asthma, jaundice, eye disease, cold and cough, hurt/fracture, delivery) in this village. The method of using these plants varied according to the nature of ailment. In majority of the cases, a decoction of leaves, stems, fruits and roots/tubers is drunk or rubbed on the body to cure ailment(s) mostly decoction is extracted by just crushing the parts in a mortar but sometimes plants parts are boiled with water and the liquid decanted. Decoction of some plants is applied externally on the wounds or the infected

Table 1: Questionnaire survey of the village herbal doctors for medicinal plants in Barind Tract Total 200 herbal doctors were respondent

Bangla name	Scientific name	Family	Site No.	Availability	Duration	Source of material
Bashok	<i>Azadirachta indica</i>	Moraceae	1,2,3,4	Vulnerable	All the year	Forest under growth
Kala magh	<i>Andrographis paniculata</i>	Acanthaceae	1,2,3,4	Vulnerable	Seasonal	Open field
Kanta natey	<i>Amaranthus spinosus</i>	Amaranthaceae	1,2,3,4	Vulnerable	Seasonal	Open places
Apang	<i>Achyranthes aspera</i>	Amaranthaceae	1,2,3	available	All the year	Thicket forest
Man kuchu	<i>Alocasia indica</i>	Araceae	4	Most available	All the year	Forest
Kata kuchu	<i>Lasia spinosa</i>	Araceae	1,2,3,4	Vulnerable	All the year	Wet forest
Goj papul	<i>Scindapsus officinalis</i>	Araceae	1,2,3,4	Vulnerable	All the year	Forest under growth
Sarpagandha	<i>Rauwolfia serpentina</i>	Apocynaceae	1,2,3,4	Endangerd	All the year	Thicket forest
Sarpagandha	<i>Rauwolfia tetraphylla</i>	Apocynaceae	1,2,3,4	Endangerd	All the year	Thicket forest
Essarmul	<i>Aristolochia indica</i>	Aristolochiaceae	1,2,3,4	Endangerd	All the year	Wet forest
Ananto mul	<i>Hemidesmus indicus</i>	Asclepiadaceae	1,2,3,4	Endangerd	All the year	Cultivated & Forest
Akanda	<i>Calotropis gigantea</i>	Asclepiadaceae	1,2	More available	All the year	Road side
Hati sur	<i>Heliotropium indicum</i>	Boraginaceae	2,3,4	Available	Seasonal	Wet forest
Simul mul	<i>Bombax ceiba</i>	Banbacaceae	2,3,4	Available	All the year	Fringing Forest
Kess raj	<i>Eclipta alba</i>	Compositae	1,2,3	Available	Seasonal	Road side
Kukur sungga	<i>Blumeo lacera</i>	Compositae	1,2,4	Available	Seasonal	Thicket forest
Bon Okra	<i>Xanthium indicum</i>	Compositae	2	Most available	Seasonal	Dwelling& open places
Assam lata	<i>Milkania cordata</i>	Compositae	1,2,3	Available	Seasonal	Cultivated & Forest
Sonalu	<i>Cassia fistula</i>	Caesalpiniaceae	1,2	More available	All the year	Road side
Kalkasunda	<i>Cassia tola</i>	Caesalpiniaceae	3	Most available	Seasonal	Fringing Forest
Boro						
kalkasunda	<i>Cassia occidentalis</i>	Caesalpiniaceae	2,3,4	Available	All the year	Cultivated and
ForestBhang	<i>Cannabis sativa</i>	Caunabinaceae	2,3,4	Available	Seasonal	Dwelling in Villages
Bohera	<i>Terminalia bellerica</i>	Combretaceae	1,3,4	Vulnerable	All the year	Open field
Vul kumra	<i>Ipomoea mauritiana</i>	Convolvulaceae	1,2,3,4	Endangerd	All the year	Hedges dwellings
Bhui orka	<i>Evolvulus nummularius</i>	Convolvulaceae	2,4	More available	Seasonal	Ringing forest
Muthaghas	<i>Cyperus rotundus</i>	Cyperaceae	1	Most available	All the year	Dense humid forest
Sarnalata	<i>Cuscuta reflexa</i>	Cuscutaceae	1,2,3	Available	All the year	Dense forest
Tala kucha	<i>Coccinea cordifolia</i>	Cucurbitaceae	1,3,4	Available	All the year	Dense forest
Pather kuche	<i>Bryophyllum calycinum</i>	Crassulaceae	1,2,3,4	Vulnerable	All the year	Dense forest
Hurhuria	<i>Cleome viscosa</i>	Capparidaceae	3	Most available	All the year	Edge of Pond
Arjun	<i>Terminalia arjuna</i>	Combretaceae	3,4	More available	All the year	Road side
Bathuashak	<i>Chenopodium album</i>	Chenopodiaceae	2	Most available	Seasonal	Open field
Amloki	<i>Embelica officinalis</i>	Euphorbiaceae	2,3,4	More available	All the year	Farm and Open places
Narasaj	<i>Euphorbia antiquorum</i>	Euphorbiaceae	1,2,3,4	Vulnerable	All the year	Open edges of forest
Jamal gota	<i>Jatropha gossypifolia</i>	Euphorbiaceae	2,4	More available	All the year	Forest out growth
Dudhea	<i>Euphorbia pulcherrima</i>	Euphorbiaceae	3,4	More available	Seasonal	Edge of Pond
Besatu	<i>Tragia involucrata</i>	Euphorbiaceae	2,3,4	Available	Seasonal	Wet forest
Nara saj	<i>Euphorbia trigona</i>	Euphorbiaceae	3	Most available	Seasonal	Dry Forest
Tal muly	<i>Curculigo orchoides</i>	Iridaceae	1,2,3,4	Endangerd	Seasonal	Dry Forest
		(Hyoxidaceae)				
Durabaghas	<i>Cynodon dactylon</i>	Gramineae	3	Most available	All the year	Dwelling& open places
Tulshi(white)	<i>Ocimum americanum</i>	Labiatae	2,3,4	Available	All the year	Edge of Pond
Satodron	<i>Leucas aspera</i>	Labiatae	1,3	More Available	Seasonal	Forest under growth
Podina	<i>Mentha spicata</i>	Labiatae	2	Most available	Seasonal	Farmland
Babuitulsi	<i>Ocimum basilicum</i>	Labiatae	2	Most available	Seasonal	Wet forest
Tulsi (Black)	<i>Ocimum sanctum</i>	Labiatae	2,3,4	Available	All the year	Thicket forest
Gobra	<i>Anisomeles indica</i>	Labiatae	3,4	More available	All the year	Fringing Forest
Danda kalas	<i>Leucas lavendulifolia</i>	Labiatae	2,3,4	Available	Seasonal	Thicket forest
Roktodron	<i>Leonurus sibiricus</i>	Labiatae	1,2,3	Available	Seasonal	Dense forest
Chinamm	<i>Plumbago zeylanica</i>	Plumbaginaceae	1,2,3,4	Endangerd	All the year	Road side
Toema	<i>Hyptis suaveolens</i>	Labiatae	1,2	Available	Seasonal	forest
Bora						
kalkesunda	<i>Cassia siamea</i>	Leguminosae	3	Most available	All the year	Wet forest
Guhibabul	<i>Accacia farnesiana</i>	Leguminosae	3,4	More available	All the year	Edge of Pond
Salpany	<i>Desmodium gangeticum</i>	Leguminosae	2,3	More Available	All the year	Open field
Dad mardon	<i>Cassia alata</i>	Leguminosae	1,2,3,4	Vulnerable	All the year	Forest
Alkusi	<i>Mimosa pruriens</i>	Leguminosae	2,3,4	Available	All the year	Wet forest
Lal kuch	<i>Abrus precatorius</i>	Leguminosae	1,2,3,4	Vulnerable	All the year	Open field
Lazza bati						
(white)	<i>Mimosa pudica</i>	Leguminosae	1,2,3,4	Endangerd	All the year	Dwelling& open places
Kalka sunda	<i>Cassia occidentalis</i>	Leguminosae	1	Most available	Seasonal	Thicket forest
Aparajeta	<i>Clitoria ternatea</i>	Leguminosae	1,2	More Available	Seasonal	Thicket forest
Ulat kambal	<i>Gloriosa superba</i>	Liliaceae	1,2,3,4	Endangerd	All the year	Dense forest
Sato mul	<i>Asparagus racemosus</i>	Liliaceae	1,2,3,4	Vulnerable	All the year	Edge of Pond
		(Asparagaceae)				

Table 1: Continuous

Bangla name	Scientific name	Family	Site No.	Availability	Duration	Source of material
Ghreta						
kunchon	<i>Aloe barbadensis</i>	Liliaceae	1,2,3,4	Vulnerable	All the year	Farmland
Banmarch	<i>Ammannia baccifera</i>	Liliaceae	2,4	More available	Seasonal	Wet forest
Choto Balla	<i>Sida acuta</i>	Malvaceae	1	Most available	Seasonal	Secondary Forest
Susnishak	<i>Marsilea quadrifoliata</i>	Mariliaceae	2	Most available	Seasonal	Secondary Forest
Nim	<i>Azadirachta indica</i>	Meliaceae	1,2,4	Available	All the year	Farmland
Kala jam	<i>Syzygium cumini</i>	Myrtaceae	2,4	More available	All the year	Road side
Akanadi	<i>Stephania japonica</i>	Menispermaceae	1,2,3	Available	All the year	Forest under growth
Sada						
punarva	<i>Boerhavia repens</i>	Nyctaginaceae	3,4	More available	Seasonal	Open field
Punarva	<i>Boerhavia diffusa</i>	Nyctaginaceae	2,4	More available	Seasonal	Cultivated & Forest
Amrul	<i>Oxalis corniculata</i>	Oxalidaceae	2,3	More available	Seasonal	Wet forest
Rasna	<i>Vanda roxburghii</i>	Orchidaceae	1,2,4	Available	Seasonal	Forest
Seal kata	<i>Argemone mexicana</i>	Papaveraceae	1	Most available	Seasonal	Road side
Bis kataly	<i>Polygonum lapathifolium</i>	Polygonaceae	3,4	More available	All the year	Open field
Panibiskatali	<i>Polygonum hydropiper</i>	Polygonaceae	2,3,4	Available	All the year	Edge of Pond
Peperomia	<i>Peperomia pellucida</i>	Piperaceae	3	Most available	Seasonal	Forest under growth
Pipul	<i>Piper longum</i>	Piperaceae	2	Most available	All the year	Wet forest
Turat chandal	<i>Desmodium motorium</i>	Papilionaceae	1,2,3,4	Endangerd	All the year	Forest
Hasti						
korno palas	<i>Butea superba</i>	Papillineae	1,2,3,4	Endangerd	Seasonal	Open field
Gandhavadulia	<i>Paederia foetida</i>	Rubiaceae	1,2,3,4	Vulnerable	Seasonal	Edge of Pond
Sagol bati	<i>Clematis gouriana</i>	Ranunculaceae	1,2,3	Available	Seasonal	Road side
Beral achra	<i>Smilax zeylanica</i>	Smilacaceae	1,2,3,4	Vulnerable	Seasonal	Edge of Pond
Bontipaiya	<i>Physalis minima</i>	Solanaceae	3,4	More available	Seasonal	Secondary Forest
Kunto keary	<i>Solanum surattense</i>	Solanaceae	2,3,4	Available	All the year	Edge of Pond
Arsogandha	<i>Withania somnifera</i>	Solanaceae	1,2,3,4	Endangerd	All the year	Wet forest
Kala Dutura	<i>Datura fastuosa</i>	Solanaceae	2,3	More available	All the year	Road side
Tit begun	<i>Solanum filicifolium</i>	Solanaceae	3,4	More available	Seasonal	Wet forest
Kanto kary	<i>Solanum xanthocarpum</i>	Solanaceae	1,3	More available	Seasonal	Open field
Ram begun	<i>Solanum ferox</i>	Solanaceae	2,3	Most available	All the year	Road side
Ban tamak	<i>Nicotiana plumbaginifolia</i>	Solanaceae	2	Most available	Seasonal	Wet forest
Bontepariya	<i>Physalis minima</i>	Solanaceae	2,4	More available	Seasonal	Thicket forest
Bon pat	<i>Corchorus fascicularis</i>	Tilaceae	2,4	More available	All the year	Road side
Shomlata	<i>Asclepias acida</i>	Umbelliferae	4	Most available	Seasonal	Cultivated & Forest
Thanquini	<i>Ceueilla asiatica</i>	Umbelliferae	2,3,4	Available	Seasonal	Road side
Nesinda	<i>Vitex negundo</i>	Verbenaceae	1,2,3,4	Vulnerable	Seasonal	Edge of Pond
Chhoto						
marmarialata	<i>Cissns repens</i>	Vitaceae	2,3,4	Available	Seasonal	Secondary Forest
Harzora	<i>Cissns quadrangularis</i>	Vitaceae	1,2,3,4	Vulnerable	All the year	Open field
Mehedae	<i>Duranta repens</i>	Verbenaceae	2,3,4	Available	All the year	Dwelling & open places
Bau Ada	<i>Alpina nigra</i>	Zingiberaceae	1,2,3,4	Vulnerable	Seasonal	Dense forest
Sati	<i>Curcuma zoderia</i>	Zingiberaceae	2	More available	Seasonal	Forest

Table 1: Continous

Ease of finding	Propagation	Habit	Part of plants used	How used	In which used
Difficult	Stems	Shrub, Erect	Leaves	Juice for feeding	Cough, Rheumatism.
Difficult	Seeds	Herb, Erect	Total Parts	Juice for feeding	Cough, Worm control, Stomach pain, Fever.
Ease	Seeds	Herb, Erect	Total Parts	Juice for feeding	Snake bite, Sexual debility.
Ease	Seeds	Shrub, Erect	Roots, Leaves	Juice for feeding	Urine, Mellitus.
Ease	Rhizome	Erect, Herb	Total Parts	Juice for feeding	Weakness, Ascites pleurisy alveolitis, Muscular pain, Sore.
Difficult	Rhizome	Herb, Erect	Rhizome	Juice for feeding and paste for surface used	Sexual debility, Lumbago.
Difficult	Seeds, Stems	Climber	Total Parts	Juice for feeding and paste for surface used	Sore, Styptic, Tonic, Stomachache.
Difficult	Seeds, Roots	Shrub, Erect	Roots	Juice for surface used	Stomachache, Gonorrhea, Eye disease
Difficult	Seeds, Roots	Shrub, Erect	Roots	Juice for surface used	Stomachache, Gonorrhea, Eye disease
Difficult	Seeds	Climber	Roots	Juice for feeding	Snakebite, Leucorrhoea, Sexual debility
Difficult	Roots	Climber	Roots	Juice for feeding	Leptic wound, Menstrual regulation, Sexual debility.
Ease	Seeds	Shrub	Root, Bark, leaves	Juice for feeding & surface used	Cholera, Gonorrhea, Eye disease

Table 1: Continue

Ease of finding	Propagation	Habit	Part of plants used	How used	In which used
Ease	Seeds	Herb, Erect	Total	Paste for surface used	Sore styptic, Fractured bone, Eczema.
Ease	stems	Erect	Total	Juice for surface used	Sore, Asthma, Constipation
Ease	Seed	Herb, Erect	Total	Juice for surface used	Leucorrhoea, Tonic.
Ease	Seeds	Herb, Erect	Roots, Leaves	Juice for feeding	Cough, Stomach pain, Itching.
Ease	Seeds	Climber, Herb	Roots	Juice for feeding	Weakness, Dyspepsia.
Ease	Seeds	Climber	Leaves	Juice for feeding	Fever, Cough, Ascites,
				Dyspepsia.	
Ease	Seeds	Tree	Roots	Juice for feeding, Surface used	Gonorrhea, Digestive.
Ease	Seeds	Erect, Herb	Roots, Leaves	Juice for feeding	Dysentery Leucorrhoea, Obstructive.
Ease	Seeds	Erect, Shrub	Leaves	Juice for feeding	Fever, Cough, Energetic, Digestive.
Ease	Seeds	Erect, Shrub	Leaves	Paste for surface used	Sore, Ring worm
Difficult	Seeds	Tree	Fruits	Juice for feeding	Pleurisy alveolitis.
Difficult	Rhizome	Climber	Rhizome	Juice for feeding	Piles, Ophthalmia, Dyspepsia.
Ease	Seeds	Erect, Shrub	Leaves, Roots,	Juice for feeding	Sexual sensation, Weakness.
					Tonic, Cough,
					Fever, Obstructive,
Ease	Seeds	Erect, Herb	Total	Juice for feeding, Surface used	Diabetes,
					Stomach, Dyspepsia.
Ease	Stems	Climber	Stems	Juice for feeding & Paste for surface used	Sore, Fever, Ear-ache.
Ease	Seeds	Climber	Leaves, Roots, Seeds	Juice for surface used	Diabetes, Itching, Puerperal.
Difficult	Leaves	Herb, Erect	Leaves	Juice for feeding	Dysentery, Leucorrhoea.
Ease	Seeds	Erect, Herb	Leaves	Juice for feeding	Fever, Cough, Dyspepsia.
Ease	Seeds	Tree	Barks	Juice for feeding	Heart disease, Digestive, Flatulence.
Ease	Seeds	Erect, Herb	Total	Juice for feeding	Weakness, Dyspepsia.
Ease	Seeds	Tree	Fruits	Juice for feeding	Weakness, Cough.
Difficult	Stems	Erect, Shrub	Stems, Leaves	Juice for surface used	Sore, Ring worm, toxic prevention.
Ease	Stems	Erect, Shrub	Stems, Leaves	Juice for feeding	Itching, Energetic, Chest pain.
Ease	Seeds	Climber	Roots	Juice for feeding	Itching, Energetic.
Ease	Seeds	Twining, Herb	Leaves	Juice for surface used	Sore, Ring worm, toxic prevention.
Ease	Stems	Erect	Leaves	Juice for feeding	Dysentery, Leucorrhoea, Dyspepsia, Chest pain.
Difficult	Roots	Herb	Roots	Juice for feeding	Piles, Jaundice, Asthma, Gonorrhea, Nose Bleeding.
Ease	Seeds	Climber	Total	Juice for feeding, Surface used	Dysentery, Styptic, Dyspepsia.
Ease	Seeds	Herb, Erect	Leaves	Juice for feeding	Fever, Cough.
Ease	Seeds	Herb, Erect	Total	Juice for feeding & surface used	Stomach disease, Digestion.
Ease	Stems	Herb, Climber	total	Juice for feeding	Cough, Fever.
Ease	Seeds	Erect, Herb	Leaves	Juice for surface used	Sore, Itching, Abscess, Constipation.
Ease	Seeds	Herb, Erect	Leaves	Juice for feeding	Tonic, Digestion.
Ease	Seeds	Herb, Erect	Total	Juice for surface used	Styptic, dysentery, Brain tonic.
Ease	Seeds	Erect, Shrub	Leaves	Juice for surface used	Sore, Ring worm, Toxic prevention.
Difficult	Seeds,	Erect, Herb	Roots, Leaves, Seeds	Juice for feeding	Asthma, Lumbago, Sexual debility.
Difficult	Seeds	Erect, Herb	Roots, Leaves	Juice for feeding	Weakness, Sexual debility, Eye disease, Aphthae.
Ease	Seeds	Herb	Total	Juice for feeding	Weakness, Sexual, Sensation.
Ease	Seeds	Erect, Shrub	Total	Juice for feeding	Fever, Cough, Weakness.
Ease	Seeds	Erect, Shrub	Roots, Leaves	Juice for feeding and paste for surface used	Abscess, Ulcer, Sore.
Ease	Seeds	Herb, Climbing	Total	Juice for feeding and paste for surface used	Itching, Tonic, Eczema.
Difficult	Seeds	Shrub	Leaves	Juice for feeding	Sexual in tension, Fever.
Ease	Seeds	Climber	Roots, Stems, Fruits	Juice for feeding	Brain tonic, Weakness, Constipation.
Difficult	Seeds	Climber	Roots, Seeds, Leaves	Juice for feeding and paste for surface used	Asthma, Cough.

Table 1: Continue

Ease of finding	Propagation	Habit	Part of plants used	How used	In which used
Difficult	Seeds	Climber	Roots	Juice for feeding	Pain, Piles, Abscess, Bubo.
Ease	Seeds	Erect	Leaves, Seeds	Juice for feeding & surface used	Fever, Diabetes, Itching, Snake bite.
Ease	Seeds	Climber	Total	Juice for feeding, Surface used	Pox, Itching, Warts, Worm, Control.
Difficult	Seeds	Erect	Roots	Juice for feeding and paste for surface used	Piles, Sensation, Leucorrhoea, Delivery, Fever, Asthma.
Difficult	Roots	Climbing	Roots	Juice for feeding	Weakness, Sexual debility, Eye disease.
Difficult	Rhizome	Erect	Leaves	Juice for feeding	Weakness, Brain tonic, Dyspepsia.
Ease	Seeds	Erect, Shrub	Leaves	Paste for surface used	Sore, Ring worm, Toxic prevention.
Ease	Seeds	Erect, Shrub	Stems, Leaves	Juice for feeding and paste for surface used	Sore, Ring worm, Toxic prevention.
Ease	Seeds	Erect, Herb	Total	Juice for feeding	Well Sleeping, Dyspepsia
Ease	Seeds	Tree	Leaves, Fruits	Juice for surface used	Abscess, Bubo, Jaundice, Sore.
Ease	Seeds, Stems	Erect, Herb	Leaves	Juice for feeding	Impotency, Ophahnia.
Ease	Seeds	Erect, Herb	Roots	Juice for feeding	Piles, Jaundice, Asthma, Gonorrhoea.
Ease	Seeds	Climber	Total	Juice for feeding	Fever, Cough, Weakness.
Ease	Seeds	Climber	Total	Juice for feeding	Fever, Cough, Weakness.
Ease	Seeds	Climber	Total	Juice for feeding	Stomach disease, Fever, Phthisis.
Ease	Seeds, Seeds	Erect	Leaves	Juice for feeding	Kidney stone, Constipation..
Ease	Seeds	Herb, Erect	Seed, Roots	Juice for feeding & surface used	Tonic, Hair colour.
Ease	Seeds	Herb, Erect	Leaves	Juice for feeding and paste for surface used	Sore, Cuts, Ache, Wounds, Scables, Biols.
Ease	Seeds	Erect, Shrub	Leaves	Juice for surface used	Sore, Ring worm, Dyspepsia
Ease	Seeds	Erect	Seeds, Total	Juice for feeding	Snakebite, Leucorrhoea, Sexual debility.
Ease	Stems	Shrub	Total	Juice for feeding and paste for surface used	Sore, Cuts, Styptic.
Difficult	Stems	Erect, Shrub	Leaves	Juice for feeding	Fever, Cough, Obstructive.
Difficult	Erect, Herb	Erect, Herb	Leaves, Roots	Juice for feeding	Piles, Jaundice, Asthma, Gonorrhoea.
Difficult	Seeds	Climber	Roots, Leaves,	Juice for feeding	Snake bite, Sexual debility.
Ease	Seeds	Erect	Total	Juice for feeding	Fever, Cough, Energetic, Digestive.
Difficult	Seeds	Climber	Roots, Seeds, Leaves	Juice for feeding	Sexual debility, Impotency, Phthises.
Ease	Seeds	Erect, Herb	Leaves, Roots	Juice for feeding	Weakness, Cough, Fever.
Ease	Seeds	Shrub, Erect	Fruits, roots	Juice for feeding	Phthises, Asthma, Warts.
Difficult	Seeds	Shrub, Erect	Roots, Stems	Juice for feeding	Sexual debility, Impotency, Phthises.
Ease	Seeds	Shrub, Erect	Roots, Seeds	Juice for feeding	Asthma, Lumbago, Sexual debility.
Ease	Seeds	Herb, Erect	Fruits	Juice for feeding & surface used	Weakness, Itching.
Ease	Seeds	Erect, Shrub	Leaves	Paste for surface used	Sore, Ring worm toxic prevention.
Ease	Seeds	Erect, Shrub	Stems	Paste for surface used	Sore, Fever Hepatitis, Metritis.
Ease	Seeds	Erect, Herb	Leaves, Roots, Seeds	Juice for surface used	Diabetes, Itching, Puerperal.
Ease	Seeds	Erect, Herb	Fruits	Juice for feeding & surface used	Weakness, Itching, Hepatitis, Metritis.
Ease	Seeds	Herb, Erect	Total	Juice for feeding	Ulcer, Restorative.
Ease	Seeds	Climber	Leaves	Juice for feeding	Puerperal, Gonorrhoea, Ear-pick.
Ease	Stems	Climber	Leaves	Juice for feeding	Weakness, Lumbago, Brain tonic.
Difficult	Seeds	Erect	Leaves, Roots, Seeds	Juice for feeding	Abdominal colic, Cracked Gleet bruises.
Ease	Seeds	Erect, Herb	Leaves, Roots	Juice for feeding	Tonic, Cough, Fever.
Difficult	Stems	Climber	Stems	Juice for feeding and paste for surface used	Abdominal colic, Cracked Gleet bruises.
Ease	Seeds, Stems	Erect, Shrub	Leaves	Juice for feeding and paste for surface used	Styptic, Sore, Energetic, Digestive.
Difficult	Rhizome	Erect	Rhizome	Juice for feeding	Impotency, Constipation, Energetic.
Ease	Rhizome	Shrub	Rhizome	Juice for feeding	Weakness, Cough, Diabetes.

part of the body i.e. *Cissus quadrangularis*. In some cases (skin ailments) the patient is plastered to set dislocated or fractured bone or for muscular pain i.e. *Heliotropium indicum*, *Cissus quadrangularis*, *Lasia spinosa*. (Table 1)

In some cases combinations of plant parts are used for best results i.e. for fever combination of leaves or seeds of *Cassia occidentalis* and leaves of *Andrographis paniculata* are found to be best result. Again combinations in rhizome of *Lasia spinosa* leaves of *Polygonum lapathifolium* are best for sore, scabies, combination in roots of *Hemidesmus indicus*, roots of *Aristolochia indica* and Rhizome of *Ipomoea mauritiana* are found to be best for sexual debility. Similar favourable combined effects have been reported by Hakim (2000). In some cases single plant is used for different disease i.e. root of *Curculigo orchioides* is used for piles, Jaundice, Asthma, Gonorrhoea, leaves of *Andrographis paniculata* are used for worm control, fever, cough, stomach pain. Similar results were denoted by (Maikhuri *et al.*, 2000). Ailments like body ache, headache, cuts, wounds, scabies, boils and skin diseases are treated by external application of the paste.

The method of using these plants varied according to the nature of ailment. In majority of the cases a decoction of leaves, stems fruits and roots, tubers, rhizome are drunk or rubbed on the body to cure ailments. Mostly decoction is extracted by just crushing the parts in a mortar but sometimes plant parts are boiled with water and the liquid decanted. Decoction of some plants is applied externally on the wounds or the infected part of the body i.e. *Cissus quadrangularis*. In some cases (Skin ailments) the patient is plastered to set dislocated or fractured bone or for muscular pain *Heliotropium indicum*, *Cissus quadrangularis*.

In the present investigation, it was observed that 14 numbered of medicinal plants are vulnerable. They are *Andrographis paniculata*, *Amaranthus spinosus*, *Lasia spinosa*, *Scindapsus officinalis*, *Terminalia belerica*, *Euphorbia antiquorum*, *Cassia alata*, *Abrus precatorius*, *Asparagus racemosus*, *Aloe barbadensis*, *Paederia foetida*, *Vitex negundo*, *Alpinia nigra* and *Smilax zeylanica*. The number of 12 medicinal plants are considered to be a endangered. They are *Rauwolfia tetraphylla*, *Rauwolfia serpentina*, *Aristolochia indica*, *Hemidesmus indicus*, *Ipomoea mauritiana*, *Curculigo orchioides*, *Plumbago zeylanica*, *Mimosa pudica* (white), *Gloriosa superba*, *Desmodium motorium*, *Butea superba* and *Withania somnifera*. Rest of the medicinal plants are available and most available.

The recording of indigenous knowledge based on traditional health care systems becomes increasingly

important. It is also suggested that there is a strong need to inventories and document the uses as well as indigenous knowledge available with local people particularly Kaviraj (Local medical practitioners).

Enumeration

Hemidesmus indicus

- The root is made into a paste with *Cynodon dactylon* and the paste is again mixed with goat's milk which is given once daily on an empty stomach for seven days to a lady after birth for lactation.
- Root made into a paste with mustard oil which is applied to cure leptic wound.

Gloriosa superba

- The root-paste is applied to the tongue in Benga disease in cows (the tongue becoming thick and full of tubercles).
- The root is also used as an abortifacient for which a single dose of the paste of 1 cm. Long root and three black peppers with milk is administered; this work in pregnancies of up to four months.
- Root made into a paste with mustard oil which is applied on the body for curing periodic fever. It should be continued for four days.
- Leaf paste is heated and applied on the forehead and neck for seven days for curing asthma of children.

***Plumbago zeylanica*:** The root (5 g) is kept in the mouth and chewed for cure of aphthae.

***Rauwolfia serpentina*:** The root (3 g) is made into a paste and given to relieve stomachache and to expel thread worms.

***Scindapsus officinalis*:** Crushed roots of the young plants (10 g) or seedings are given to relieve stomachache.

***Curculigo orchioides*:** Root is made into paste with 10 seeds of gram and given once daily to stop nose bleeding, Piles, Jaundice, Gonorrhoea.

***Aristolochia indica*:** The root is applied to wounds. The plant is believed to keep snakes away.

***Smilax zeylanica*:** Root is made into paste which is prescribed in anaemia once daily on an empty stomach for four days.

In the above discussion it is clear that those medicinal plants which were found in all site are

considered as endangered. Because they are going to extinct from the forest by unsustainable harvesting. Besides they have vast medicinal value.

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