INVENTORY OF FOREST-BASED MEDICINAL PLANTS – A CASE STUDY IN SOUTH WEST BENGAL

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Introduction

Medicinal plants have been used as a major source of therapeutic agents by man for thousands of years. In India, out of 15,000 species of flowering plants about 17% are considered to be of medicinal value (Jain, 1968). Most of these plants are collected from nature indiscriminately for commercial exploitation, resulting in depletion of natural population and some to the extent of becoming rare and endangered. With the patronage of herbal medicines and their products increasing, there is an urgent need to conserve the endemic diversity in the medicinal plants before it is wiped out from nature. The factors contributing to the erosion of diversity are : bringing more land under cultivation due to biotic pressures, commercialization of agriculture for increased production, introduction of selected improved cultivars and thrust on socio-economic development. Therefore considering these factors, an inventory of medicinal plant species which evolved and adapted over a long period, assumes great significance (Dalal *et al.*, 1998; Kumar *et al.*, 1997; Pushpangadan, 1998).

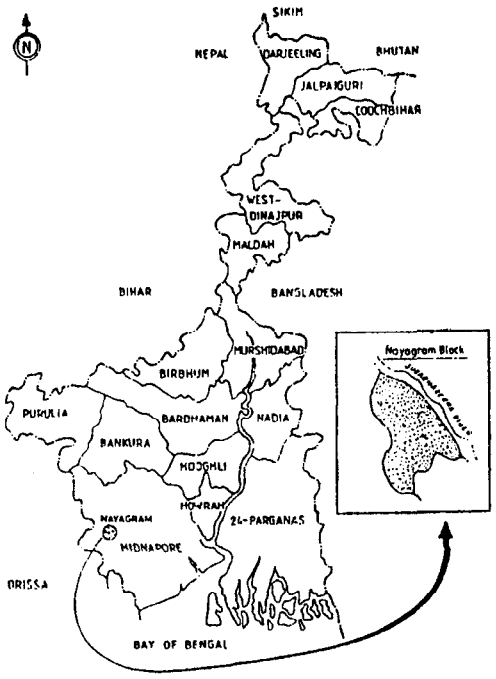
The Nayagram Forest Range, the present study area, under Midnapore West Division of South West Bengal, is covered by a typical Sal forest where a number of important medicinal plants are found. Some of these species are being supplied to different pharmaceutical agencies in Kolkata and other parts of the State. In the extraction process of these medicinal plants from forests, the villagers – who are least conscious of ecological implications and sustainable harvesting – play the most vital role. In the absence or paucity of this knowledge, the inventory aims at creating a platform for providing data on growth, production, productivity, sustainable extraction, processing, marketing, utilization and various other ecological and economic parameters for all medicinally important plant species.

The present study is focused on the dual objectives of identification of the concerned species and their analysis in terms of plant parts used, diseases diagnosed etc. Keeping the above in view, a detailed survey on medicinal plants was undertaken in the forests of Nayagram Range of Midnapore District, South West Bengal.

Study Area

Nayagram Range is situated along the border between West Bengal and Orissa (Fig. 1). The explored area is tropical in

Fig. 1



Location of Study Area –
Nayagram Block, Midnapore (W.B.)

nature. The average annual rainfall varies from 1,200 mm to 1,400 mm and average annual temperature varies between 10°C to 43°C. The area lies 44 m above msl. The soil of this region is acid red lateritic, light to medium in texture, low in organic content with poor water holding capacity. The regenerating forest of this region is mainly covered by Sal trees. Other companion species identified are *Madhuca indica, Pterocarpus marsupium, Diospyros melanoxylon, Adina cordifolia, Schleichera trijuga, Lagerstroemia parviflora, Holoptelea integrifolia,* etc. Nayagram Range has got immense forest produces like mushrooms, medicinal plants, sabai grass, sal seeds, sal leaves, mahul seeds, kendu leaves, different types of edible fruits and tubers, fodder, fuelwood etc. The forests of Nayagram Range need exploratory research to identify the plants of medicinal value leading to a sustainable management of phytodiversity.

Methodology

Identification of medicinal plant species was primarily done by gathering local grass root level information regarding availability and utilization of various medicinally important plants. Indigenous knowledge played an important role where participation of villagers and local foresters is a factor for any significant outcome.

Identification of species was done with the help of a team of experienced foresters, local knowledgeable people and other members of the study team at suitable intervals in different seasons from January 1998 to March 2000. This simple methodology of species identification, utilizing the indigenous knowledge of people in the forest and local foresters can be termed as "Spot Identification Method". This exercise was however further backed by literature survey done by the study team members. For unidentified species, Herbarium samples of flowering twigs were prepared and sent to Botanical Survey of India (BSI), Howrah for identification.

To study the utilization of plants for medicinal purposes and to understand the status of indigenous method of treatment, several workshops on herbal medicine were organized in the study area. The uniqueness of the workshops was the participation of a large number of herbal practitioners who came from different remote areas of Nayagram Range and discussed the problems and prospects of using medicinal plants as an indigenous method of curing diseases.

Altogether five workshops were conducted. In one workshop on the theme "Diseases and Treatments with Local Herbal Medicines", the participants specially described the symptoms, nature of diseases and narrated the methods of processing medicines, treatments and dietary advice. Subsequently, in other workshops, the issues related to protection of medicinal species in the context of Forest Protection Committee (FPC) managed forest, sustainable harvesting, processing at local levels, development of small scale units, marketing, enterprise generation etc. were taken up for interaction with the rural practitioners, Panchayat and forest functionaries. Analysis of the information is expected to provide effectiveness of these medicinal plants in curing diseases, prospects and methods of use and future guidelines for tapping this resource.

Results and Discussion

The regenerating forests of Nayagram have been found to be enriched with a large number of indigenous medicinal plants. In total 75 species were identified and have been shown in Table 1. It is revealed that among all the medicinal plants identified, the number of species was highest (35%) in the herb class followed by tree (34%), shrub (14%), climber (14%), and creeper (3%). It could also be noted that on the basis of their occurrence, about 40 per cent of the medicinal species were available in abundance whereas 32 per cent were limited and 15 per cent were considered as rare species. The species diversity collected belongs mostly to dicotyledonous plant families compared to monocotyledonous plant families. Although a number of species have been identified in the Nayagram Range, a few of them like *Hemidesmus indicus, Aristolochia indica, Asparagus racemosus, Strychnos nux-vomica, Abrus precatorius, Holarrhena antidysenterica, Ipomea digitata,* etc. are found to be commercially important and also regularly used by the forest people for medicinal purposes.

Medicinal and Ethno-botanical uses

The medicinal plants identified are useful in traditional and ethno-botanical remedies for a number of disorders. The main ethnic groups in the study area from whom ethnobotanical information were gathered are Santal, Lodha, Baiga, Bhumij etc. The vernacular names and uses of the plants vary from one tribal group to the other and also from place to place. The medicinal uses have also been presented in Table 1. The disorders and diseases that the tribals generally do not come across refer them as hallucinations of psychosomatic origin and are treated accordingly. Many plants for which no specific use is known are yet regarded as powerful herbs by the tribal doctors for curing hallucinations. It was also observed that the tribal doctors use more than one herb for a particular disease or disorder. According to most of the herbal practitioners, powdered roots and bark of different herbs in which Sarpagandha (*Rauvolfia serpentina*) and Pipul (*Piper longum*) are indispensable ingredients.

Conclusion

It is evident from the present findings that Nayagram Range characterized as Sal dominated regenerating forest is endowed with large number of medicinal plants. Proper identification of the medicinal plant species has a vital role in extraction of this natural wealth and conservation of bio-

Table 1

List of Medicinal plants identified in the Nayagram Forest Range, Midnapore West Division, South West Bengal.

Sl. No.	Scientific Name	Local Name	Family	Type of plant*	Trend of occurrence**	Uses as medicine
1	2	3	4	5	6	7
1.	*Abrus precatorius*	Kunch/Runj	Fabaceae	Cr	A	Leaf & root: cold and cough.
2.	*Achyranthes aspera*	Apamarang	Amarantaceae	H	L	Seed: cough, excessive eating at frequent intervals.
3.	*Acorus calamus*	Boch	Araceae	H	L	Root: cold, cough, throat pain.
4.	*Adhatoda zeylanica*	Basak	Acanthaceae	S	A	Bark: indigestion, worm; Leaf: respiratory trouble, asthma, skin disease, smallpox.
5.	*Aegle marmelos*	Bel	Rutaceae	T	L	Fruit: controlling mucous in stool, Leaves: Intestinal worms, Abscess, pus oozing from ears.
6.	*Allium ampelloprasum*	Bon rosun	Liliaceae	H	L	Leaf: boils, arteriosclerosis,constipation, influenza, gallstone, high B.P., diptheria, pharyngitis.
7.	*Aloe vera*	Ghritkumari	Liliaceae	H	R	Leaf jelley: burns, wound, swelling due to injury, sore eyes, asthma; Leaf juice: irregular menstruation Leaf pulp: cough with phlegm.
8.	*Amorphophallus sylvaticus*	Bon Ol	Araceae	S	A	Rhizomes : constipation due to piles, rheumatic arthritis.
9.	*Anacyclus phyrethrum*	Akarkarabaj	Compositae	H	L	Root paste: rheumatism, chest pain, respiratory trouble.
10.	*Andrographis paniculata*	Kalmegh	Acanthaceae	H	A	Leaf/whole plant: worms, blood dysentry, liver problems.
11.	*Aristolochia indica*	Iswarmul	Aristolochaceae	Cr	A	Leaf/Root : antitodes for epilepsy, tumour healing.

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1	2	3	4	5	6	7
12.	*Asparagus racemosus*	Gyshira/ Satmuli	Liliaceae	Cl	A	Root (Tuber) : blood dysentry, epilepsy, philaria, night blindness, biliary colic, reduced breast milk, vomiting, burning.
13.	*Azadirachta indica*	Neem	Meliaceae	T	L	Bark: abdominal pain, impure blood, headache, fever, irregular menstruation scabies; Leaf: fever in infants, snakebite to test the presence of venom in the body; Seed: head lice.
14.	*Basella alba*	Bon pui	Basellaceae	Cl	A	Leaf : whooping cough, urticaria, skin disease, gonorrhoea.
15.	*Boerhavia diffusa*	Khapra	Nyctaginaceae	H	A	Whole plant: urinary problems, cough, asthma, worms.
16.	*Butea monosperma*	Polash	Papilionaceae	T	A	Flower : Fever; Bark: fracture, worms, piles.
17.	*Calotropis gigantia*	Akanda	Asclepiadaceae	S	A	Leaves: headache, earache, pain in arms and legs; Latex : boil, scabies, Root: abscess not ripening.
18.	*Careya arborea*	Kum	Lecythidaceae	T	R	Root paste: insect bite; Flower : weakness after delivery
19.	*Cassia fistula*	Sonali	Caesalpiniacea	T	L	Tender leaves: ring worm, Bark: scabis, Pods: to kill bugs
20.	*Cassia tora*	Jhunjhuni/ Chakunda	Caesalpiniacea	H	A	Leaf: ring worm, other skin diseases
21.	*Ceiba pentandra*	Swet simul	Bombacaceae	T	L	Leaf: gonorrhoea Flower decoction: vaginalcleaning.
22	*Celastrus paniculatus*	Kujri	Celastraceae	Cl	L	Bark : abortive agent, Leaf extract : controlling fever and rheumatic pain, Seed oil: beriberi.

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1	2	3	4	5	6	7
23.	*Cephalandra indica*	Telakucha	Cucurbitaceae	Cl	A	Leaf : chronic diarrhoea, asthma, diabetes
24.	*Coccinia indica*	Bon Kundri	Cucurbitaceae	Cl	A	Root: abscess, Leaf juice: caries, Fruit: dizziness in cattle
25.	*Cocculus hirsutus*	Dodoya	Menispermaceae	Cl	A	Leaves: burning chest, stomach ulcers, diarrhoea in infants, sore eyes, Whole plant: jaundice.
26.	*Curculigo orchioides*	Talmuli	Amaryllidaceae	H	A	Leaf: piles
27.	*Datura metel*	Kalodhutara	Solanaceae	S	A	Root: dog bite; Leaf juice: worms, diarrhoea, asthma, boils.
28.	*Dendrophthoe falcata*	Akalady	Loranthaceae	S	R	Bark: leucoderma.
29.	*Dioscorea bulbifera*	Tita Alu	Dioscoreaceae	Cl	A	Tuber: piles and syphilis.
30.	*Dolicos biflorus*	Kurtikalai	Fabaceae	H	L	Seed: piles, constipation, worms, rheumatism.
31.	*Emblica officinalis*	Amalki	Euphorbiaceae	T	R	Fruit: anaemia, vomiting
32.	*Euphorbia hirta*	Dudhia	Euphorbiaceae	H	A	Whole plant including roots: heart disease, cough, skin disease.
33.	*Flacourtia indica*	Bainch	Flacourtiaceae	S	A	Ripe fruits: diarrhoea, Root paste: skin diseases.
34.	*Gardenia gummifera*	Bhurur	Rubiaceae	S	A	Resin: indigestion, Guinea worm, cough.
35.	*Gmelina arborea*	Gamar	Verbenaceae	T	R	Fruit: blood dysentry of babies
36.	*Gossypium herbaceum*	Bon Kapas	Malvaceae	S	A	Fruit: abscess, pus in ear, Root: jaundice, menstrual problems.
37.	*Hemidesmus indicus*	Anantamul	Asclepiadaceae	Cr	A	Root: impure blood, gonorrhoea, rheumatism, skin diseases and syphilis.
38.	*Holarrhena antidysenterica*	Indrajab/ Kurchi	Apocyanaceae	T	A	Bark dicoction with Bel: dysentry, Leaf juice: Joint pains, piles.

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1	2	3	4	5	6	7
39.	*Ichnocarpus frutescens*	Dudhilata	Apocyanaceae	Cl	A	Root: piles, Eczema, Asthma, cough, diarrhoea, diminished lactation in women, skin disease, tongue injury in children.
40.	*Ipomoea batatus*	Chakunda	Convolvulaceae	Cr	L	Leaves: diarrhea, Seeds: skin diseases, asthma.
41.	*Ipomoea digitata*	Bhuin Kumro	Convolvulaceae	H	L	Tuber: abdominal pain, weakness and no saliva in mouth.
42.	*Lannea coromandelica*	Doka (Jeol)	Anacardiaceae	T	L	Bark and leaf: blood dysentry, heart disease, tootache; Gum: boils.
43.	*Madhuca indica*	Mahul	Sapotaceae	T	A	Leaf : sores in mouth; Inner bark: amenorrhoea; Flower : abscess; Bark: Joint pains and diarrhoea; Sprouted seed: chronic headache; Seed: constipation.
44.	*Operculina turpethum*	Dudhia Kalmee	Convolvulaceae	Cl	A	Root: mental disease, indigestion, rheumatism, constipation; Leaf: menstrual problems.
45.	*Oroxylum indicum*	Bhaluksukti	Bignoniaceae	T	L	Root: blood dysentry; Bark: rheumatism
46.	*Oscimum sanctum*	Bon Tulsi	Lamiaceae	H	A	Leaf: fever with shivering, wound, night blindness, cough.
47.	*Piper longum*	Pipul	Piperaceae	Cl	L	Fruit: carminative, analgesic, diuretic, stomachache, rheumatism.
48.	*Pongamia pinnata*	Karanj	Fabaceae	T	L	Root: dog bite; Dry Leaf: disinfectant; Seed powder: whooping cough; Seed oil: scabies.

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1	2	3	4	5	6	7
49.	*Premna latifolia*	Bhuin Kamal	Verbenaceae	T	A	Leaf juice: kidney problem, jaundice, menstrual problems, heart disease; Bark powder: lowering Blood Pressure; Bark: lowering cholesterol.
50.	*Pterocarpus marsupium*	Piasal	Fabaceae	T	R	Leaf: boils; Gum : toothache.
51.	*Rauvolfia serpentina*	Sarpagandha	Apocynaceae	H	R	Root: blood pressure, snake bite, phileria.
52.	*Ricinus communis*	Castor/Reri	Euphorbiaceae	S	A	Leaves: chest pain, jaundice; Seed oil: joint pain, toothache.
53.	*Schleichera trijuga*	Kusum	Sapindaceae	T	L	Bark : Tuberculosis, Seed oil: Arthritis.
54.	*Semecarpus anacardium*	Bhela	Anacardiaceae	T	A	Seed powder with other herbs: piles, worms, indigestion, leprosy, rheumatism.
55.	*Shorea robusta*	Sal	Dipterocarpacea	T	A	Leaf: worms, headache, blood dysentry, gonorrhoea, acidity, boils.
56.	*Sidarhombifolia*	Kamraj	Malvaceae	H	R	Root: piles, dilated heart, Whole plant: urinary problem.
57.	*Smilax macrophylla*	Ramdatan	Liliaceae	Cl	A	Root: chest pain, urinary problems, syphilis.
58.	*Solanum torvum*	Sahasravedi	Solanaceae	H	L	Fruit: asthma, Rheumatic pain.
59.	*Solanum xanthocarpum*	Kantikari	Solanaceae	H	A	Root decoction: cough; Seed powder: toothache; Whole plant: cough
60.	*Soymida febrifuga*	Rohini	Meliaceae	T	R	Bark: worms, injury, cough.
61.	*Stephania hermandifolia*	Akanady	Menispermaceae	Cl	L	Leaf: high fever, piles, birth control.
62.	*Strychnos nuxvomica*	Kuchla	Loganiaceae	T	A	Bark: menorrhagia, leprosy,snake bite; Seed: Corns and hair fall, Juice of fresh wood: cholera, dysentery.

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1	2	3	4	5	6	7
63.	*Symplocos recemosa*	Lodh	Symplocaceae	T	L	Leaf: uterine sedatives.
64.	*Syzygium cumini*	Jaam	Myrtaceae	T	A	Fruit & seed: gonorrhoea; Bark: Excessive menstruation; Leaves: Vomiting.
65.	*Tagetes erecta*	Gedhi	Asteraceae	H	A	Leaf: blood dysentry, piles, haemoptysis, Petals: earache, boils, red eyes.
66.	*Tamarindus indica*	Tentul	Caesalpiniaceae	T	L	Seed: scorpion bite Bark: bleeding from nostrils excessive menstruation.
67.	*Taramnus labilis*	Bon Kurti	Fabaceae	H	A	Whole plant: irregular fever, Spermatorrhoea.
68.	*Terminalia arjuna*	Arjun	Combretaceae	T	L	Barks: low blood pressure, Leucorrhoea, blood dysentry; Fruits: cardiac problems.
69.	*Terminalia bellirica*	Bahera	Combretaceae	T	A	Fruit: cough, stopping bleeding in fresh wound, sores in mouth, Seed oil: controlling grey hair.
70.	*Terminalia chebula*	Haritaki	Combretaceae	T	R	Fruit: piles, skin disease, asthma, constipation.
71.	*Tinospora cordifolia*	Gulancha	Menispermaceae	Cl	L	Leaf: fever, Jaundice, Psoriasis, throat problems.
72.	*Uraria hamosa*	Salpani	Fabaceae	H	L	Young shoot: cough, chest pain, respiratory trouble, blood dysentry, piles.
73.	*Vitex negundo*	Beguni	Verbenaceae	S	A	Leaves: joint pains, partial paralysis; Roots: pains in arms and legs.
74.	*Wedelia calendulacea*	Bhringaraj	Asteraceae	H	A	Leaf: headache, hair fall,dysentry, worms.
75.	*Woodfordia fruticosa*	Dhadki	Lythraceae	S	R	Flower: teething in infants,diarrhoea in pregnant women.

* Plant type: T - Tree, S - Shrub, H - Herb, Cl. - Climber, Cr. - Creeper.

** Trend of occurrence: A - Abundant, L - Limited, R - Rare.

diversity in the forest. Haphazard and unscientific exploitation to meet the demands of the middlemen has resulted in drastic reduction in the density of the medicinal plants and virtual extinction of some valuable species. Some endangered species call for immediate attention for planned propagation while totally extinct ones demand rehabilitation. However, such *in-situ* conservation and revival of extinct species can not be done without protecting the territories of the forests. Forest fringe dwellers have a big role in this matter.

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SUMMARY

An exploration was undertaken for identification of medicinal plants frequently used by the forest fringe people of Nayagram Range under Midnapore West Forest Division of South West Bengal. A total of 75 species having medicinal value could be identified and presented along with their identifying characters like botanical name, local name, family, plant type etc. and uses of the plant components against different diseases. The species diversity in medicinal plants belongs to 34 dicotyledonous plant families and 4 monocotyledonous families. In dicotyledons, the maximum number of genera belong to the family Fabaceae and the maximum number of species belong to the genus *Terminalia*. In monocotyledons, the family Liliaceae is represented by a maximum number of genera. The medicinal utility of the plant species has also been highlighted.

वनाधारित औषध पादपों की तालिका – दक्षिणी पश्चिम बंगाल में किया गया एक विशेष अध्ययन

नीलांजना दास व आर०एन० चट्टोपाध्याय

सारांश

दक्षिणी पश्चिम बंगाल के पश्चिमी मिदानापुर मण्डल में पड़ने वाले नयाग्राम परिक्षेत्र वन के निकट रहने वाले लोगों द्वारा बहुधा उपयोग किए जाने वाले औषधि पादपों की जानकारी प्राप्त करने के लिए एक अन्वेषण कराया गया । इसमें कुल मिलाकर औषधि गुणों वाली 75 जातियां पहचानी गई जिन्हें उनकी पहचान वाले लक्षणों जैसे वानस्पतिक नाम, स्थानीय नाम, कुल पादप का प्ररूप आदि और विभिन्न बीमारियों के उपचार में काम आने वाले उनके अंगों के उपयोग सहित प्रस्तुत किया गया है । औषध पादपों की विविधता उन्हें 34 द्विबीजपत्रीय पादप कुलों और 4 एकबीजपत्रीय कुलो में रखती है । द्विबीजपत्रों में, प्रजातियों की अधिकतम संख्या फैबेसी या पृथुशिम्बि कुल में आती है तथा जातियों की अधिकतम संख्या *टर्मिनेलिया* या अर्जुन प्रजाति की है । एकबीजपत्रीयों में लिलियेसी या नलिनी कुल में प्रजातियों की संख्या अधिकतम है । पादप जाति की औषधीय उपयुक्तता पर भी प्रकाश डाला गया है ।

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