

Wild Plants Used as Cure to Diseases by the People of Tribal Communities in the District of Birbhum, West Bengal, India

Subhra Bandopadhyay, Debnath Palit

Received 30 January 2024, Accepted 23 June 2024, Published on 5 August 2024

ABSTRACT

Sects of indigenous origin especially tribal population residing at the forest-fringes are the traditional users of the folk-medicines derived from the plants grown in proximity to where they live. Such age-old practices through generations have transformed knowledge into neural wisdom in them. This can open up a new dimension for the commercial synthesis of “Bio-medicines” supportive to eradicate the menace of drug resistance. The pharmaceutical industry can promote researches on bio-medical aspects of the ethno-medicinal plants (many being wild) and plant parts which are best addressed as Non-Timber Forest Products, to cure and prevent human diseases. Present study has dealt with these Non-Timber Forest Products to conceptualize and promote natural preventives and

curatives as replacements for chemically synthesized medicines (drugs) having incidence of drug resistance and harmful side effects.

Keywords Non-Timber Forest Products (NTFPs), Drug resistance, Folk-medicine, Neural wisdom.

INTRODUCTION

One can visualize the existence of reality in myths when neural essence is assimilated from the literature and scripts of the Vedic Ages (1500-500 BCE). They provide the best information to establish that all plants are therapeutically potential for curing diseases - common or specific (Sarkar *et al.* 2016, Koner and Mondal 2022). The best of its usage is traditionally followed in the society of indigenous sects in our Nation (Yu *et al.* 2021). The unique medicinal property of the plants does support work on the value addition of Non-Timber Forest Products (NTFPs) for use in the pharmaceutical industry (Dinda *et al.* 2020). NTFPs are largely forest-derivatives that tribal people and other communities too are using for income generation and as tools for curing illnesses in their routined life (Chatterjee and Das 2017, Koner and Mondal 2022). Little work has been done so far on the therapeutic importance of locally available plants. In the present study, care is taken to open up a new scope of research work for using wild plants available locally for therapeutic uses. Bio-chemically exploring the plant can have resulted in the extraction of active

Subhra Bandopadhyay¹, Dr Debnath Palit^{2*}

¹Department of Conservation Biology, Durgapur Government College, Durgapur, Paschim Bardhaman, West Bengal, India.

²Research Guide and Principal, Durgapur Government College, Durgapur, Paschim Bardhaman 713214, West Bengal, India

Email : dgcprincipal2021@gmail.com

*Corresponding author

substances (phyto-chemicals) that the plant keeps within (Prasathkumar *et al.* 2021). These substances of bio-origin may be used in turn, for synthesizing bio-medicines as the benevolent blessings to mankind for elimination of possible menace of drug resistance. The present narrative deals with this tagline in mind and it is attempted to find out the extent of scope for medicinal uses of NTFPs. Objectives of the present study include:

To understand the reality in traditional belief for using wild plants as remedy to diseases.

To realize the impact of folk-medicines on the local commons of tribal populace.

To understand the therapeutic significance of plants and plant parts as viable forms of NTFPs.

To assess the viability of using ethno-medicinal plants for the preparation of bio-medicines as natural replacement to chemically synthesized medicines or drugs.

To provide valid inputs for future researches.

MATERIALS AND METHODS

Study area

District of Birbhum is lying between 23°32'30" and 24°35'0" north latitude and 88°1'40" and 87°5'25" east longitude. The district having 19 Administrative blocks, covers an area of 4545 sq km. It is bounded by the State of Jharkhand on north-west, on east by Murshidabad and Purba Bardhaman districts and on south by districts of Paschim Bardhaman and Purba Bardhaman of West Bengal. Ethnic races like Santal, Kora, and Oraon tribes are distributed as habitation patches (Choudhury *et al.* 2013).

Field survey

With the above background on record, the present study was done in 2021 and 2022 in 24 villages with tribal habitations in Rajnagar, Suri-I, Suri-II, Bolpur-Sriniketan, and Dubrajpur Block were selected to work with tribal people of these areas largely depend on the utilization of NTFPs as the prime source of their livelihood and sustenance. Being cash-poor, the general commons of the tribal populace are basically

dependent on folk-medicines for treatment of the diseases they usually suffer from sustenance (Pradhan and Rahaman 2019).

Tribal habitations in the district of Birbhum were chosen as study-area because tribals are habitual-users of ethno-medicinal plants. The basic methodology of this study rests on qualitative and quantitative sources of data, collected from field surveys with pre-printed questionnaires with tribal populace considered as base population. A multi-stage random sampling method was done for the selection of households from each village. "Contact, connect and communication" was an effective mode employed for interactions. During field survey, hundred wild ethno-medicinal plants were collected and identifications as regards their taxonomic nomenclature were done (Prain 1903, Chase *et al.* 2016, Madani. *et al.* 2017, Paria 2022). The collected plant specimens are kept preserved in Botany Department of Durgapur Government College. Application and usage of the ethno-medicinal plants formed the computation of the principal database. Secondary data were collected from the district Magistrate and Divisional Forest Officer, Block Development Officers, Forest Beat Officers of Birbhum district. Both primary and secondary data form the base-line to interpret the outcome of the present study.

Extensive field visits led to understand the ethno-medicinal impacts on the lives of tribal people. Information on 100 wild ethno-medicinal plants growing wild almost within hand's reach are collected, identified following established procedure. Informative relevance of these plants is shown in Table 1.

RESULTS AND DISCUSSION

Analyzes of applications

Interactive conversations with Majhi-haram @ Gaon-Bura (Village-Heads) and other elderly people of the tribal-inhabited villages disclosed on the therapeutic properties of the ethno-medicinal plants they use in the form of folk-medicines for treatment of diseases or health hazards as may be called many a time varying from common to chronic illnesses (Koner and Mondal 2022, Sarkar *et al.* 2016). A revelation came out from

Table 1. Hundred ethno-medicinal plants growing wild within hand's reach.

Sl. No.	Local name	Botanical name	Family
1	Kunch	<i>Abrus precatorius</i> L.	Fabaceae
2	Bon-Kapas	<i>Abutilon indicum</i> (L.) Sweet	Malvaceae
3	Akashmani	<i>Acacia auriculiformis</i> A.Cunn. ex Benth.	Mimosaceae
4	Babla	<i>Acacia arabica</i> Willd.	Mimosaceae
5	Apang	<i>Achyranthes aspera</i> L.	Amaranthaceae
6	Basak	<i>Adhatoda vasica</i> Nees	Acanthaceae
7	Bel	<i>Aegle marmelos</i> (L.) Correa	Rutaceae
8	Sirish	<i>Albizia lebbek</i> (L.) Benth.	Mimosaceae
9	Chhatim	<i>Alstonia scholaris</i> (L.) R.Br.	Apocynaceae
10	Kanta-Notey	<i>Amaranthus spinosus</i> L.	Amaranthaceae
11	Notey	<i>Amaranthus viridis</i> L.	Amaranthaceae
12	Kajubadam	<i>Anacardium occidentale</i> L.	Anacardiaceae
13	Kalmegh	<i>Andrographis paniculata</i> Nees	Acanthaceae
14	Nona-Ata	<i>Annona reticulata</i> L.	Annonaceae
15	Kadam	<i>Anthocephalus cadamba</i> (Roxb.) Bosser	Rubiaceae
16	Anantalata	<i>Antigonon leptopus</i> Hook. & Arn.	Polygonaceae
17	Sialkanta	<i>Argemone mexicana</i> L.	Papaveraceae
18	Neem	<i>Azadirachta indica</i> A.Juss	Meliaceae
19	Janti	<i>Barleria cristata</i> Lam.	Acanthaceae
20	Bansh	<i>Bambusa arundinacea</i> Willd.	Poaceae
21	Tal	<i>Borassus flabellifer</i> L.	Arecaceae
22	Simul	<i>Bombax ceiba</i> L.	Bombacaceae
23	Punornova	<i>Boerhavia repens</i> L.	Nyctaginaceae
24	Piyal	<i>Buchanania lanzan</i> Spreng.	Anacardiaceae
25	Palash	<i>Butea frondosa</i> Roxb.	Fabaceae
26	Akanda	<i>Calotropis procera</i> (Aiton) W.T. Aiton	Apocynaceae
27	Sibjal phool	<i>Cardiospermum halicacabum</i> L.	Sapindaceae
28	Bandarlathi	<i>Cassia fistula</i> L.	Caesalpiniaceae
29	Nayantara	<i>Catharanthus roseus</i> (L.) G. Don	Apocynaceae
30	Thankuni	<i>Centella asiatica</i> Urb.	Apiaceae
31	Bethosak	<i>Chenopodium album</i> L.	Chenopodiaceae
32	Chorkanta	<i>Cryosophogon aciculatus</i> Trin.	Poaceae
33	Harjora	<i>Cissus quadrangularis</i> L.	Vitaceae
34	Harhura	<i>Cleome viscosa</i> L.	Capparidaceae
35	Ghetu	<i>Clerodendrum viscosum</i> Vent.	Verbenaceae
36	Telakucha	<i>Coccinia grandis</i> (L.) Voigt	Cucurbitaceae
37	Kanshira	<i>Commelina benghalensis</i> L.	Commelinaceae
38	Bon-Tulsi	<i>Croton bonplandianus</i> Baill.	Euphorbiaceae
39	Swarnalata	<i>Cuscuta reflexa</i> Roxb.	Cuscutaceae
40	Doob ghas	<i>Cynodon dactylon</i> (L.) Pers.	Poaceae
41	Mutha ghas	<i>Cyperus rotundus</i> Kunth	Cyperaceae
42	Sisu	<i>Dalbergia sissoo</i> Roxb.	Fabaceae
43	Gulmohar	<i>Delonix regia</i> Raf.	Caesalpiniaceae
44	Surjasisir	<i>Drosera burmanni</i> DC.	Droseraceae
45	Kend	<i>Diospyros melanoxylon</i> Roxb.	Ebenaceae
46	Keshuth	<i>Eclipta prostrata</i> L.	Asteraceae

Table 1. Continued.

Sl. No.	Local name	Botanical name	Family
47	Hingche	<i>Enhydra fluctuans</i> Lour.	Asteraceae
48	Sursuri ghas	<i>Eragrostis tenella</i> Benth.	Poaceae
49	Eucalyptus	<i>Eucalyptus globulus</i> Labille	Myrtaceae
50	Bhui ankra	<i>Evolvulus nummularius</i> L.	Convolvulaceae
51	Bot	<i>Ficus benghalensis</i> L.	Moraceae
52	Dumur	<i>Ficus hispida</i> L.f.	Moraceae
53	Jagna-Dumur	<i>Ficus racemosa</i> Wall.	Moraceae
54	Ashwattha	<i>Ficus religiosa</i> L.	Moraceae
55	Gime shak	<i>Glinus oppositifolius</i> (L.) Aug. DC.	Molluginaceae
56	Ulatchandal	<i>Gloriosa superba</i> L.	Liliaceae
57	Gurmara	<i>Gymnema sylvestre</i> R.Br.	Apocynaceae
58	Hatisur	<i>Heliotropium indicum</i> L.	Boraginaceae
59	Anantamul	<i>Hemidesmus indicus</i> (L.) R.Br.	Apocynaceae
60	Kurchi	<i>Holarrhena antidysenterica</i> (L.) Wall. ex A.DC.	Apocynaceae
61	Kulekhanra	<i>Hygrophila spinosa</i> T. And.	Acanthaceae
62	Kolmi	<i>Ipomoea aquatica</i> Forssk.	Convolvulaceae
63	Shyama lata	<i>Ichnocarpus frutescens</i> (L.) W.T. Aiton	Apocynaceae
64	Lal Verenda	<i>Jatropha gossypifolia</i> L.	Euphorbiaceae
65	Verenda	<i>Jatropha curcas</i> L.	Euphorbiaceae
66	Jarool	<i>Lagerstroemia speciosa</i> Pers.	Lythraceae
67	Chotra	<i>Lantana camara</i> L.	Verbenaceae
68	Shwetdron	<i>Leucas aspera</i> Spreng.	Lamiaceae
69	Mahua	<i>Madhuca indica</i> J. F. Gmel.	Sapotaceae
70	Susni	<i>Marsilea quadrifolia</i> L.	Marsileaceae
71	Baghnokh	<i>Martynia annua</i> L.	Martyniaceae
72	Lajjabati	<i>Mimosa pudica</i> Mill.	Mimosaceae
73	Bon Karla	<i>Momordica dioica</i> Wall.	Cucurbitaceae
74	Sajne	<i>Moringa oleifera</i> Lamk.	Moringaceae
75	Padma	<i>Nelumbo nucifera</i> Gaertn.	Nelumbonaceae
76	Shalook	<i>Nymphaea lotus</i> L.	Nymphaeaceae
77	Sada Tulsi	<i>Ocimum basilicum</i> L.	Lamiaceae
78	Kalo Tulsi	<i>Ocimum sanctum</i> L.	Lamiaceae
79	Khet-papra	<i>Oldenlandia corymbosa</i> L.	Rubiaceae
80	Amrul	<i>Oxalis corniculata</i> L.	Oxalidaceae
81	Gandal pata	<i>Paederia scandens</i> (Lour.) Merr.	Rubiaceae
82	Keya	<i>Pandanus fascicularis</i> Lam.	Pandanaceae
83	Kanakchura	<i>Peltophorum pterocarpum</i> Backer	Caesalpiniaceae
84	Khejur	<i>Phoenix acaulis</i> Buch-Ham. ex Roxb.	Arecaceae
85	Bhuin-amla	<i>Phyllanthus niruri</i> L.	Euphorbiaceae
86	Karanja	<i>Pongamia pinnata</i> Pierre	Fabaceae
87	Redy	<i>Ricinus communis</i> L.	Euphorbiaceae
88	Kash	<i>Saccharum spontaneum</i> L.	Poaceae
89	Kalkasundi	<i>Senna occidentalis</i> (L.) Link	Caesalpiniaceae
90	Swet Berela	<i>Sida cordifolia</i> L.	Malvaceae
91	Shal	<i>Shorea robusta</i> C.F. Gaertn.	Dipterocarpaceae
92	Amra	<i>Spondias pinnata</i> (L.f.) Kurz.	Anacardiaceae
93	Kalo Jam	<i>Syzygium cumini</i> (L.)	Myrtaceae

Table 1. Continued.

Sl. No.	Local name	Botanical name	Family
		Skeels.	
94	Arjun	<i>Terminalia arjuna</i> W. & A.	Combretaceae
95	Tentul	<i>Tamarindus indica</i> L.	Caesalpinaceae
96	Segun	<i>Tectona grandis</i> L.f.	Verbenaceae
97	Kolke	<i>Thevetia nerifolia</i> Juss.	Apocynaceae
98	Tridaksha	<i>Tridax procumbens</i> L.	Asteraceae
99	Nishinda	<i>Vitex negundo</i> L.	Verbenaceae
100	Kul	<i>Ziziphus mauritiana</i> Lam.	Rhamnaceae

the interaction to the effect that the diseases which the practitioners of folk-medicines treat; can be broadly categorized into following 2 groups:

1. **Acute diseases** This class commonly covers

diseases like fever including Malaria, cough and cold, Diarrhoea and dysentery, Colic pain, Constipation, Wound/injury including bone fracture, snake bite, scorpion bite and animal bites (such as bites of dog, cat, mongoose, and jackal), skin diseases (Eczema/ Scabies), Nausea/ vomiting, Measles, Conjunctivitis, muscle cramp.

2. **Chronic diseases** This category generally includes diseases like Tetanus, Tumour, Piles, Respiratory disorder, Bronchitis, Rheumatism and Arthritis, Hepatitis, Asthma, Gastric and Mouth ulcer, Obesity, Diabetes, Tuberculosis, Leprosy, Leucorrhoea, Migraine, Epilepsy, Cancer, Sexually transmitted Infections (STIs) such as Gonorrhoea and Syphilis, Anaemia, Gallstones, Hypertension, Bleeding Gum (Gingivitis), Diphtheria, Urinary Tract infection,

Table 2. Therapeutic uses of 35 wild plants ('A' = Acute diseases and 'B' = Chronic diseases).

Sl. No.	Therapeutic utility	Local name	Botanical name
1	(A) Fever, Colic pain and Animal bites (B) Tumour, Bronchitis, Tetanus and Hepatitis	Kunch	<i>Abrus precatorius</i>
2	(A) Cough and Cold and Diarrhoea. (B) Asthma and killing of Intestinal Parasites.	Basak	<i>Adhatoda vasica</i>
3	(B) Diabetes, Gastric Ulcer and removal of intestinal parasites.	Bel	<i>Aegle marmelos</i>
4	(A) Bleeding gum and Scorpion bite (B) Leprosy and Epilepsy	Sirish	<i>Albizia lebbek</i>
5	(A) High Fever and Malaria. (B) Cancer, Tumour and Ulcer.	Chhatim	<i>Alstonia scholaris</i>
6	(A) Colic pain and Snake bite (B) Diabetes, Rheumatism and Ulcer	Kanta-Notey	<i>Amaranthus spinosus</i>
7	(A) Diarrhoea, Fever and Skin diseases (B) Diabetes, Anaemia and Gallstones	Kajubadam	<i>Anacardium occidentale</i>
8	(A) Fever, Colic pain, Appetite loss and Diarrhoea (B) Hypertension, Diabetes and Tuberculosis	Kalmegh	<i>Andrographis paniculata</i>
9	(A) Malaria and Skin diseases (B) Diabetes, Rheumatism and Bleeding Gum	Neem	<i>Azadirachta indica</i>
10	(A) Nausea and Vomiting (B) Diabetes and Respiratory disorder	Tal	<i>Borassus flabellifer</i>
11	(A) Fever and Cough and Cold (B) Asthma	Piyal	<i>Buchanania lanzan</i>
12	(B) Piles and Tumours	Palash	<i>Butea frondosa</i>
13	(A) Scabies and Wound/Injury (B) Hypertension, Diabetes and Cancer	Nayantara	<i>Catharanthus roseus</i>
14	(A) Fever and Skin diseases (B) Anaemia, Gastric Ulcer and Leprosy	Thankuni	<i>Centella asiatica</i>
15	(A) Cough and Cold, Muscle Cramps, Measles, Dysentery and Snake bite (B) Diabetic Retinopathy and Epilepsy	Doob ghas	<i>Cynodon dactylon</i>
16	(A) Diarrhoea (B) Hepatitis, Respiratory disorders and Diphtheria.	Keshuth	<i>Eclipta prostrata</i>
17	(B) Asthma, Obesity, Diabetes, Tuberculosis, Leprosy and Piles	Jagna Dumur	<i>Ficus racemosa</i>
18	(A) Snake bite (B) Obesity and Diabetes	Gurmara	<i>Gymnema sylvestre</i>

Table 2. Continued.

Sl. No.	Therapeutic utility	Local name	Botanical name
19	(A) Fever and Colic pain (B) Rheumatism, Ulcer and STI	Hatisur	<i>Heliotropium indicum</i>
20	(B) Rheumatism, Leprosy and STI	Anantamul	<i>Hemidesmus indicus</i>
21	(A) Dysentery, Malaria and Snake bite (B) Leprosy	Kurchi	<i>Holarrhena antidysenterica</i>
22	(B) Rheumatism, STI and Liver dysfunction	Kulekhanra	<i>Hygrophila spinosa</i>
23	(A) Wound/Injury, Eczema, Scabies and Constipation (B) Rheumatism, Ulcer, STI and Leprosy	Lal-verenda	<i>Jatropha gossypifolia</i>
24	(B) Asthma and Jaundice	Shwetdron	<i>Leucas aspera</i>
25	(B) Diabetes, Rheumatism and Ulcer	Mahua	<i>Madhuca indica</i>
26	(A) Diarrhoea and Skin diseases (B) Hypertension and Respiratory disorders	Susni	<i>Marsilea quadrifolia</i>
27	(A) Measles, Wound/Injury and Constipation (B) Diabetes, Conjunctivitis, Goiter, Asthma, Epilepsy and Ulcer	Sajne	<i>Moringa oleifera</i>
28	(B) Cancer, Kidney dysfunction, Hypertension, STI, Diabetes and Piles	Padma	<i>Nelumbo nucifera</i>
29	(B) Diabetes, Gastric Ulcer, Liver and Kidney dysfunctions, Cancer and Arthritis	Tulsi	<i>Ocimum sanctum</i>
30	(A) Dysentery and Colic pain (B) Jaundice and Arthritis	Gandalpata	<i>Paederia scandens</i>
31	(B) Jaundice, Diabetes, Gallstone, Liver dysfunction and Urinary Tract Infection	Bhui-Amla	<i>Phyllanthus niruri</i>
32	(A) Asthma and Tuberculosis	Swet-Berela	<i>Sida cordifolia</i>
33	(B) Diabetes, Anaemia, Tumour and Hypertension	Arjun	<i>Terminalia arjuna</i>
34	(A) Colic pain, Diarrhoea and Snake bite (B) Obesity, Respiratory disorders and Renal Cell Carcinoma	Tentul	<i>Tamarindus indica</i>
35	(B) Jaundice, Arthritis, Leucorrhoea, Obesity, Diabetes, Liver and Ocular disorders	Kul	<i>Ziziphus mauritiana</i>

dysfunctions of liver and kidney, Jaundice, Insomnia, Goiter, Paralysis, Ocular disorders, killing of intestinal parasites (Taeniasis and Ascariasis).

With this understanding in mind, 35 plants out of hundred wild plants (as noted in Table 1) are short-listed based on category-wise therapeutic utility and mentioned in Table 2. Significant findings of the study are :

Practitioners of folk-medicines have no formal medical education.

They depend on the neural wisdom gained from their forefathers.

They do symptomatic treatment of diseases.

They make medicines from local plants that grow wild at the neighbourhood vicinity.

Beside plant body, plant-parts like stem, bark, leaf, roots, fruits, seeds, are used as ingredients of

folk-medicines.

Harmful side effects of folk-medicines are interestingly negligible.

CONCLUSION

Treatment with folk-medicines using plant-parts of the ethno-medicinal plants is practised through generations. The silent learning and knowledge flowing down the generations in tribal populace are assimilated in the form of neural wisdom. Present study endorses the reality of using folk-medicines for the treatment and cure of diseases and the practice is found to have won the confidence of the general commons of the covered tribal villages (Santhosha and Kar 2017). The established applicability of this neural wisdom is viable for ushering up new approaches for researches to make in the field of pharmaceutical industries. This will become a natural blessing to promote manufacture of bio-medicines out of those phyto-chemicals (active principles) present

in different parts of the ethno-medicinal plants within the meaning of NTFPs (Dinda *et al.* (2020).

It is supposed that there is the immense potentiality of NTFPs for use as viable bio-medicines if manufactured in commercial scale. This will prevent the incidence of drug resistance and allied menace of side effects that we generally experience while taking chemically synthesized medicines/ drugs. Genetic interaction of human beings with the environment will best be supported through applications of biologically compatible drug administration. Nature will be happy then and Earth will turn to be the blissful shelter where human beings will love to live in.

ACKNOWLEDGMENT

Authors are grateful to acknowledge the help and co-operation received from the Department of Conservation Biology of Durgapur Government College during the course of conducting field study and in identification of plant specimens collected. Authors are indebted to Sri Sandip K. Dutta, Special Secretary to Government of West Bengal for extending his cordial co-operation and support. Authors are also thankful to the District Magistrate of Birbhum, Divisional Forest Officer of Birbhum Forest Division and other Officers of Block Administration of different Development Blocks for extending logistic and administrative support to ease of doing field visits, interactions with tribal commons and collections of materials.

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