

An observation on the phytotherapeutic uses of plants by the tribal people of some forest areas in Birbhum and Burdwan districts, West Bengal, India

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ABSTRACT

In this study observations have been made on traditional knowledge related with ethnomedicinal uses of plants by the tribal people of different forest areas of Birbhum and Burdwan districts, West Bengal, India. A total of 29 medicinal plants have been recorded from the study areas which are used by the tribal people in formulation of 19 types of herbal preparation for curing 15 types of diseases and ailments. Many of these preparations are new as they have not been recorded earlier in standard literature. The investigated plant taxa have alphabetically been enumerated providing their botanical names along with families, local or tribal names, parts used, name of the diseases, mode of administration, locality of collection, etc. Bioassay of these ethnomedicinal claims has to be carried out for their scientific validation in future.

INTRODUCTION

Ethnobotany can be defined as the total natural and traditional relationship and interactions between man and his surrounding plant wealth. In India, organised studies in ethnobotany have been initiated long ago and during last few decades scientific studies have been proceeded on various lines of work like ethnobotany of specific tribes, of certain regions, of particular plant groups or diseases and on many other miscellaneous sub- or interdisciplinary approaches (Bandyopadhyay and Mukherjee, 2005; 2009; Bhattacharyya and Mukherjee, 2006; Chanda and Mukherjee, 2012; Jain, 1965; 1981; 1987; 1991; 1997; Maheshwari, 2000; Mandal, 1988; Mandal and Yonzone, 1988; Rahaman, 2012; Rahaman and Mandal, 1998; Singh and Pandey, 1998; Trivedi and Sharma, 2004). The present investigation provides the significant informations regarding ethnomedicinal uses of plants by the Santal tribe of Birbhum and

Burdwan districts of West Bengal (Fig. 1) which are new to the existing inventory of Indian Ethnobotany. The data of this study can be used in future for preparing a full length detailed inventory of ethnobotany of these respective districts as well as West Bengal.

The district Birbhum is quite rich in natural resources. It extends over about 4528.61 sq km and is situated between 87° 10' and 88° 02' East longitude and between 23°33' and 24°35' North latitude. Tribal population of the district is 6.7% of its total population (Census of India, 2001).

The district Burdwan extends over about 7024 sq km and it is situated between 87° 54' and 87° 90' East longitude and between 23°04' and 23°06' North latitude. The total population of the district is 6,895,514 (Census, 2001). It is bounded on the north by Birbhum and Murshidabad districts, on the east by Nadia district, on the southeast by Hooghly district and on the southwest by Bankura and Purulia districts. The northwest part of the district is bounded by Dhanbad district of Jharkhand. The tribal people of these two districts are dependent to some extent upon the forest flora for their livelihood.

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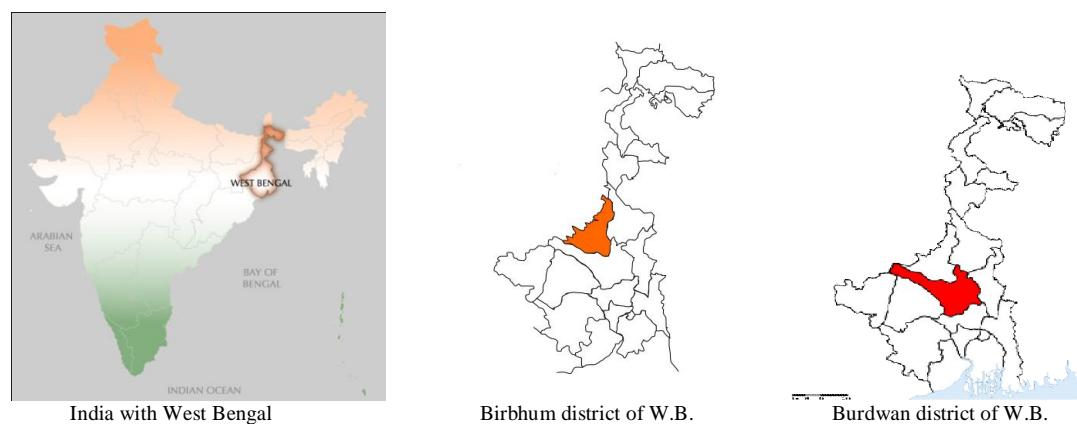


Fig. 1: Map of the study area.

MATERIALS AND METHODS

Frequent field trips were conducted to collect the ethnomedicinal information from different tribal areas of Birbhum and Burdwan districts of West Bengal for last two years. Prior Informed Consent (PIC) has been taken from the respective tribal medicine men and other knowledgeable persons. The informations have been collected from the informants of the study areas following the standard methods (Jain, 1987; Jain and Mudgal, 1999). A standard questionnaire was employed to collect the information about local name of the plants, plant parts used, preparation of herbal medicine, its mode of administration, etc. To confirm the authenticity of the collected data, it has always been cross checked by interviewing other tribal medicine men of the same and different localities. The collected plant species have been identified with the help of different floras (Guha Bakshi, 1984; Sanyal, 1994; Varma, 1981). The collected plant specimens have been preserved following the standard method (Jain and Rao, 1977) and kept in the Visva-Bharati Herbarium (VBH) of the Botany Department, Visva-Bharati, Santiniketan for future references.

RESULTS AND DISCUSSION

A total of 29 ethnomedicinal plants have been recorded from the study area which are used by the tribal people in formulation of 19 types of ethnomedicine that cure 15 types of diseases and ailments. Among 19 ethnomedicinal formulations, 10 formulations are administered in the form of single drug preparation (monoherbal) for treatment of hemi-crania, body ache, cold and cough, measles, pox, toothache, etc. In 9 cases, multiple herb preparations (polyherbal) are used in treatment of intermittent fever, burn, stomach ache, acidity, white discharge, dysentery, dyspepsia, etc. Through statistical analysis it has been found that different plant parts are used in different frequencies (**Table-1**).

Of the total 29 plants involved in formulation of ethnomedicines, materials of 24 plants are collected by the tribal people from the wild, 2 from cultivation and 3 plant materials are procured from commercial sources (**Table-2**).

Table 1: Percentage composition of different plant parts used as drugs.

Plant parts	Total No.	Percentage (%)
Bark	12	41.37
Bulb	04	13.79
Flowers and Fruits	04	13.79
Roots and rhizomes	03	10.34
Seeds	01	03.44
Stem	02	06.89
Whole plant	03	10.34

Table 2: Percentage composition of sources of the recorded plant.

Sources	Total No.	Percentage (%)
Wild (Natural)	24	82.75
Commercial	03	10.34
Cultivated	02	06.89

Lime [$\text{Ca}(\text{OH})_2$] and salt (NaCl) are also procured from the commercial sources which are used by the tribal people as ingredients in preparation of herbal drug. These investigated plant taxa spread over 25 species, 24 genera and 19 families of dicotyledons and 4 species, 4 genera and 3 families of monocotyledons (**Table-3**). Habitually the investigated taxa fall under 4 groups like Trees, Shrubs, Herbs and Climbers. The numbers of species present in each group and their respective percentage have been defined as: Trees-15 (51.72%), Shrubs- 2 (6.89%), Herbs-10 (34.48) and Climbers-2 (6.89%) (**Table-4**). The data collected in this study have been compared with the standard literature on medicinal and ethnomedicinal studies of West Bengal as well as India and some of the uses have been found new ones as they have not been reported earlier (Acharya and Mukherjee, 2010; Agarwal, 1986; Bandyopadhyay and Mukherjee, 2006; Chanda and Mukherjee, 2011; Chopra et al., 1956; Das et al., 2009; Ghosh et al., 2011; 2012; Jain, 1981; 1991; 1997; Kirtikar and Basu, 1991; Maheshwari, 2000; Mitra and Mukherjee, 2009; Mondal and Mandal, 1994; Mondal and Rahaman, 2012; Mondal et al., 1998; Mukherjee and Bauri, 2011; Rahaman, 2012; Rahaman and Das, 2012; Rahaman and Pradhan, 2011; Rahaman and Saha, 2011; Rahaman et al., 2008; 2009; Tarafder, 1983; 1984; Trivedi and Sharma, 2004; Uphof, 1968). The investigated plant species have been enumerated along with their botanical names, families, local names, tribal names, parts used, mode of administration, locality of collection, etc.

Table . 3: Percentage composition of the recorded plant species and their groups.

Plant groups	Dicotyledonous plants		Monocotyledonous plants	
	Total No.	Percentage (%)	Total No.	Percentage (%)
Families	19	86.36	03	13.63
Genera	24	85.71	04	14.28
Species	25	86.20	04	13.79

Table 4: Percentage composition of investigated taxa based on habit.

Habit	Total No.	Percentage (%)
Climbers	02	06.89
Herbs	10	34.48
Shrubs	02	06.89
Trees	15	51.72

CONCLUSION

The awareness has been created regarding the documentation of indigenous knowledge of any traditional society worldwide. Like other indigenous knowledge system, this traditional knowledge of herbal medicine practised among the Santal community of Birbhum and Burdwan districts should be conserved through its documentation before its loss from the respective tribal societies forever. The data documented here in this study will be helpful in preparation of the district as well as state level inventory of ethnobotany and ethnomedicine. The information of this investigation has to be exploited further for their scientific validation.

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Enumeration of the investigated taxa:

A. Monoherbal preparation –

1. Botanical name and family – *Acacia nilotica* (Lam.) Willd. ex Del subsp. *indica* (Benth.) Brenan (Mimosaceae)

Common English name – Indian gum Arabic tree, Black babon.

Local name- Babla

Tribal name – Kikar

Parts used – Leaves

Disease – Toothache

Mode of administration – Fresh leaves (3-7cm) are chewed once in the morning for 7 days.

Field No.- 162, 29.

Locality of collection – Goalpara and Kanakpur.

2. Botanical name and family – *Aerva javanica* Juss. ex Schult. (Amaranthaceae)

Common English name – Kapok bush, Desert cotton.

Local and Tribal name – Bishahari

Parts used – Leaves

Disease – Cuts and wounds

Mode of administration– About 3-5gm fresh leaves are made into paste and applied twice a day for 2 – 3 days on affected areas.

Field No.- 125, 192, 46.

Locality of collection – Khairdanga, Bautia and Fuldanga.

3. Botanical name and family – *Bambusa*

aurundinacea Roxb. (Poaceae)

Common English name – Thorny bamboo

Local and Tribal name – Bans, Ketua

Parts used – Bark

Disease – Cuts and wounds

Mode of administration– Bark paste is mixed with lime (1:1) and applied on affected areas once a day for 4-5 days.

Field No.- 20.

Locality of collection – Goalpara.

4. Botanical name and family – *Cocos nucifera* L. (Arecaceae)

Common English name - Coconut

Local and Tribal name – Narkel

Parts used – Fruits

Disease – Measles and pox

Mode of administration – Water of green coconut applied on the body twice a day for 3 days.

Field No.- 106, 117.

Locality of collection – Raipur and Gonpur.

5. Botanical name and family – *Datura metel* L. (Solanaceae)

Common English name – Datura, Thorn apple, Hindu Datura.

Local - Dhutra

Tribal name – Marang-tunture, Dhatura, Tantara-ba

Parts used – Leaves

Disease – Cold, cough and swelling of throat.

Mode of administration – Slightly warmed fresh leaf (1-2) paste is administered twice daily for 3 days on the swelled throat.

Field No.- 38.

Locality of collection – Ballavpur

6. Botanical name and family – *Elephantopus scaber* L. (Asteraceae)

Common English name – Elephant's foot

Local and Tribal name – Phudna, Gogalata, Shamdulum

Parts used – Roots

Disease – Hemi-crania

Mode of administration – About 10gm of roots are made into paste and applied on affected area of the head once a day for 5-7 days.

Field No.- 121, 209, 145.

Locality of collection – Khairdanga, Gonpur and Illumbazar.

7. Botanical name and family – *Holoptalea integrifolia* (Roxb.) Planch. (Ulmaceae)

Common English name – Indian elm, Kanju, Entire leaved palm.

Local and Tribal name – Pata badam, Charrah

Parts used – Bark

Disease – Body ache

Mode of administration – 50-60 gm bark paste mixed with 10-20 gm salt (NaCl₂) and after mild warming applied on the body twice a day for 2 - 3 days.

Field No.- 160.

Locality of collection – Bidyadharpur.

8. Botanical name and family – *Justicia gendarussa* Burm.f. (Acanthaceae)

Common English name - Warer willow,

Gandarus, Daun Rusa.

Local and Tribal name – Bishalyakarani, Jagatmadan, Vataghni

Parts used – Whole plant

Disease – Body ache

Mode of administration – Whole plants are cut into small pieces and boiled in water. Half cup of the decoction applied as body massage thrice a day for 2-3 days.

Field No.- 57.

Locality of collection – Bautia.

9. Botanical name and family – *Tagetes patula* L. (Asteraceae)

Common English name – French marigold

Local and Tribal name – Genda

Parts used – Leaves

Disease – Cuts and wounds

Mode of administration – 3-5 leaves are made into paste and applied on the affected parts twice a day for 4-5 days.

Field No.- 199.

Locality of collection – Goalpara.

10. Botanical name and family – *Terminalia chebula* (Gaertn.) Retz. (Combretaceae)

Common English name – Chebulic Myrobalan

Local – Haritaki

Tribal name – Rola-daru, Hora-dary

Parts used – Fruits

Disease – Cold and cough

Mode of administration – A fruit is taken by chewing once a day for 3 days.

Field No.- 44,23,180.

Locality of collection – Khairdanga, Ahmmedpur and Bautia.

B. Polyherbal preparation -

1.a) Botanical name and family – *Sida rhombifolia* L. (Malvaceae)

Common English name – Common bala, Broomjute sida.

Local – Lalberela

Tribal name - Kuruni

Parts used – Stem

b) Botanical name and family – *Piper nigrum* L. (Piperaceae)

Common English name – Black pepper

Local and Tribal name – Golmorich

Parts used – Fruits

Disease – Dyspepsia

Mode of administration – About 50-60 gm stem of *S. rhombifolia* L. and 21 fruits of *P. nigrum* L. are made into paste and administered orally once a day for 7 days in the morning in empty stomach.

Field No.- 107, 43.

Locality of collection – Shibarampur and Ahmmedpur.

2.a) Botanical name and family – *Curcuma longa* L. (Zingiberaceae)

Common English name - Turmeric

Local and Tribal name – Halud, Haldi

Parts used – Flowers

b) Botanical name and family – *Nymphaea nouchali* Burm.f. (Nymphaeaceae)

Common English name – Indian red water lily.

Local – Lal shaluk

Tribal name - Sapla-ba

Parts used – Rhizomes

Disease – Menstrual problem

Mode of administration – Rhizomes of *N. nouchali* Burm.f. and flowers of *C. longa* L. are made into paste, then administered orally once a day for 4-5 days.

Field No.- 156, 133.

Locality of collection – Goalpara and Sehera.

3.a) Botanical name and family – *Andrographis paniculata* (Burm.f.) Wall. ex Nees (Acanthaceae)

Common English name - Creat

Local – Kalmegh

Tribal name – Bhui-nimb

Parts used – Whole plant

b) Botanical name and family – *Swertia chirata* Buch.-Ham. (Gentianaceae)

Common English name - Swertia

Local and Tribal name – Chirata

Parts used – Stem

Disease – Stomach ache

Mode of administration – Whole plant of *A. paniculata* (Burm.f.) Wall. ex Nees and stem of *Swertia chirata* Buch.-Ham. (1:1) are made into paste and administered orally once a day for 3 days.

Field No.- 84, 27.

Locality of collection – Ganpur and Bautia.

4.a) Botanical name and family – *Papaver somniferum* L. (Papaveraceae)

Common English name – Opium Poppy

Local and Tribal name – Posta, Pustu

Parts used – Seeds

b) Botanical name and family – *Saccharum officinarum* L. (Poaceae)

Common English name - Sugarcane

Local and Tribal name – Aakh**Parts used** – Stem**Disease** – Stomach ache and dysentery**Mode of administration** – 3-5 gm seeds of *P. somniferum* L. are made into paste and dissolved in a cup of stem juice of *S. officinarum* L., and administered orally once a day for 2-3 days.**Field No.-** 116, 15.**Locality of collection** – Goalpara and Kanakpur.**5.a) Botanical name and family** – *Azadirachta indica* A. Juss. (Meliaceae)**Common English name** – Neem tree, Margosa tree.**Local** – Neem**Tribal name** – Nim-daru, Bokom-dare**Parts used** – Bark**b) Botanical name and family** – *Mangifera indica* L. (Anacardiaceae)**Common English name** – Mango tree, Spring tree, Cuckoo's joy.**Local** – Aam**Tribal name** – Uli-daru, Amati**Parts used** – Bark**c) Botanical name and family** – *Syzygium cumini* (L.) Skeels. (Myrtaceae)**Common English name** – Jambolan, Black plum, Java plum.**Local** – Jam**Tribal name** – Marang-kuda, Jamun**Parts used** – Bark**d) Botanical name and family** – *Terminalia arjuna* (Roxb. ex DC.) Wt. and Arn. (Combretaceae)**Common English name** – White murdah, White winged myrobalan.**Local** – Arjun**Tribal name** – Gara-hatana, Kahuna**Parts used** – Bark**Disease** – Dysentery**Mode of administration** – Bark of *A. indica* A. Juss., *M. indica* L., *S. cumini* (L.) Skeels. and *T. arjuna* (Roxb. ex DC.) Wt. and Arn. made into paste, then mixed with water and filtered. Half cup of it mixed with 3-4 gm lime (Ca(OH)₂) and administered orally once a day for 3 days in the morning.**Field No.-** 205, 12, 30, 169**Locality of collection** – Ballavpur, Kanakpur, Gonpur and Khairdanga.**6.a) Botanical name and family** – *Buchanania lanzan* Spreng. (Anacardiaceae)**Common English name** -

Almondette tree, Cuddapah almond.

Local – Piyal**Tribal name** - Sarop**Parts used** – Bark**b) Botanical name and family** – *Madhuca longifolia* (Koenig) McBride var. *latifolia* (Roxb.) Chevalier (Sapotaceae)**Common English name** – The madhu tree, Mowra butter tree, Illipe butter tree, South Indian Mahua tree.**Local** – Mahua**Tribal name** – Maul-daru, Mahul-dare**Parts used** – Bark**c) Botanical name and family** – *Shorea robusta* Gaertn.f. (Dipterocarpaceae)**Common English name** - Sal**Local and Tribal name** – Sal, Shal.**Parts used** – Bark**d) Botanical name and family** – *Terminalia arjuna* (Roxb. ex DC.) Wt. and Arn. (Combretaceae)**Common English name** - White murdah, White winged myrobalan.**Local** – Arjun**Tribal name** - Gara-hatana, Kahuna**Parts used** – Bark**Disease** – Burn**Mode of administration** – Barks (1:1:1:1) of *B. lanzan* Spreng., *M. longifolia* (Koenig) McBride var. *latifolia* (Roxb.) Chevalier, *S. robusta* Gaertn.f. and *T. arjuna* (Roxb. ex DC.) Wt. and Arn. are cut into small pieces, then boiled with water and applied on the affected areas twice a day for 5-7 days.**Field No.-** 177, 32, 187, 66**Locality of collection** – Khairdanga, Goalpara, Ilumbazar and Raipur.**7.a) Botanical name and family** – *Elephantopus scaber* L. (Asteraceae)**Common English name** – Elephant's foot**Local** – Phudna**Tribal name** – Mara-kata-ba**Parts used** – Roots**b) Botanical name and family** – *Ichnocarpus frutescens* R. Br. (Apocynaceae)**Common English name** – Black creeper**Local** – Shyamllata**Tribal name** – Prir-hore, Saonlar**Parts used** – Roots**Disease** – Intermittent fever**Mode of administration** – Roots (1:1) of *E. scaber* L. and *I. frutescens* R. Br. are cut into small pieces made a small bundle and hang around the neck of the patient for 7 days.**Field No.-** 55, 194.**Locality of collection** – Khairdanga and Bidyadharpur.**8.a) Botanical name and family** – *Lannea coromandelica* (Houtt.) Merrill (Anacardiaceae)**Common English name** – Indian ash-tree

Local and Tribal name – Jiyal, Doka

Parts used – Bark

b) Botanical name and family – *Streblus asper* Lour. (Moraceae)

Common English name – Siamese Rough-Bush

Local – Saorah

Tribal name – Ote-chum, Sahra

Parts used – Bark

Disease – Acidity

Mode of administration – Barks of *S. asper* and *L. coromandelica* (1:1) are made into paste mixed with water and then filtered. Half cup of the soup administered twice a day for 4-5 days before a meal.

Field No.- 15, 82.

Locality of collection – Bannabadanga and Gonpur.

9.a) Botanical name and family – *Achyranthes aspera* L. (Amaranthaceae)

Common English name – Prickly-chaff flower

Local – Apang, Charchare

Tribal name – Rechari, Chir-chitt

Parts used – Whole plants

b) Botanical name and family – *Piper nigrum* L. (Piperaceae)

Common English name – Black pepper

Local and Tribal name – Golmarich

Parts used – Fruits

Disease – White discharge

Mode of administration–10gm of *A. aspera* L. plant and 3 fruits of *P. nigrum* L. are made into paste and administered orally once a day for 3 days in the morning in empty stomach.

Field No.- 48, 173.

Locality of collection – Shibarampur and Sehera.

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