

Ethnobotanical Studies in Nawarangpur District, Odisha, India

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ABSTRACT

Traditionally, plants have been used as a source of medicine in India by indigenous people inhabiting various terrains for the control of different ailments afflicting human. An ethno botanical survey was undertaken in Nawarangpur District, Odisha, India. The plants and their traditional use are part of the natural and cultural heritage of the region. The study was carried out regarding the medicinal plants used by the local peoples during 2000 to 2004. Finally, the data were assessed to which extent plants are vulnerable due to collection and habitat destruction. An ethno botanical survey was undertaken in the Nawarangpur District, Odisha, India. Data were collected through field assessments from traditional healers and locals by means of personal interviews and semi-structured questionnaires. Voucher specimens were collected following standard methods, identified with the help of pertinent floras and taxonomic experts and deposited in the Herbarium, RRL-B, India for future references. A total of 69 plant species belonging to 43 families are reported during the study. The major life forms were herbs, trees, shrubs, climbers, small tree and creeper. Several medicinal plants recognized for the treatment of various diseases were collected. The root parts were widely used, followed by leaf, bark, seed and stem. This study reveals that medicinal plants still play a vital role in the primary healthcare of this local community. Traditional medicines also have the potential to form the basis of pharmaceutical drugs for the treatment of a range of diseases. Further, the information requires validation for further clinical usage.

Keywords: Ethno botany, Medicinal plant, Traditional medicine, Nawarangpur district.

INTRODUCTION

India is well known as an “Emporium of medicinal plants”. It possesses about 8% of the estimated biodiversity of the world with around 12600

species and is one of the 12 mega biodiversity centers with 2 hot spots of biodiversity in the Western Ghats and North-eastern region. It's also rich in ethnic diversity, there are about 67.37 million tribal people belonging to 537 tribal groups living in different geographical locations with various subsistence patterns^{1,2}. These tribal groups living in diverse, rich areas possess a wealth of knowledge and skills on the utilization and conservation of food and medicinal plants^{3,4}. According to the World Health Organization (WHO), almost 65% of the world's population has incorporated the value of plants as a methodology of medicinal agents into their primary modality of health care⁵. It is often noted that 25% of all drugs prescribed today come from plants^{6,7}. This estimate suggests that plant-derived drugs make up a significant segment of natural product– based pharmaceuticals.

Ethno botany is a multidisciplinary science which is defined as the interaction between plants and people⁸. Documenting the indigenous knowledge through ethno botanical studies is important for the conservation and utilization of biological resources⁹. The Ethno botanical investigation has led to the documentation of a large number of wild plants used by tribal's for meeting their multifarious requirements¹⁰.

Of the 30 districts of Orissa, Nawarangpur lying on the western part of Orissa bordering Chhattisgarh suffer from non-utilization of its forest resources though it has vast potentialities. Nawarangpur district harbours a rich diversity of ethno botanical species, which generate considerable benefits from social and economic perspectives. Until now, people are preparing medicines from their available species of plants, which were used to treat common diseases. Ethno medicinal uses of plants in different parts of Orissa are well studied^{11,12}.

However, due to population pressure, accelerated urbanization, recurring drought, and deforestation, most of the medicinal plants are either destroyed or on the verge of extinction¹³. The aim of this study was, therefore, to identify and document the species of the plants associated with medicinal parts, methods of preparation of medicine and major uses in Nawarangpur district, Odisha, India.

MATERIALS AND METHODS

Description of Study Area

The ethno botanical study was conducted in the Nawarangpur district of the Odisha state of India during the year 2000-2004. It is lying between 19° 10' 42" and 20° 6' 12" N latitudes and between 81° 51' 30" and 82° 52' 36" E longitudes. With an area of 5290.1 sq. km., Nawarangpur is a landlocked district, surrounded on the west and north by Bastar and Raipur districts of Chhattisgarh state, and on the east and south by the Kalahandi and Koraput districts of Orissa. The whole district is more or less an elevated plateau of Eastern Ghats with occasional valleys and peaks ranging from 2,000 ft to 3,000 ft. (Figure 1). The soil of the district is of three different types; red, black cotton and lateritic soils. The climate of Nawarangpur is characterized by an equable temperature all through the year. May is the hottest month with mean daily maximum temperature of 39.62°C and the mean daily minimum of 11.7°C. The minimum temperature goes as low as 9.7°C during the middle of December and the maximum goes up 40.2°C during the middle of May. The average annual rainfall is 1423 mm.

Fieldworks and collection of data

The study involved intensive explorations and critical study of specimens for the last four years. The field trips were organized in such a way so as to cover all the areas of the district at regular intervals in

different seasons between 2000 to 2012, 2000 to 2004. As a result, it became possible to record the seasonal variations in the vegetation, including distributional patterns and collect most of the plants in different developmental stages of their life cycle. Plant specimens were collected in sets of four both in flowering and fruiting stages taking due care to collect the healthy specimens. Field observations on phenology, habit, habitat, local names, local uses, frequency of occurrence etc. were recorded in the field note books at the time of collection and the collected specimens were tagged with field book numbers.

Processing of voucher specimens for herbarium preparation and identification

The voucher specimens were brought to the laboratory and processed for herbarium specimen preparation. Care was taken to identify the specimens in the field itself while the specimens were fresh. Their identity was ascertained in the Herbarium with the help local flora, monographs, revisions and other taxonomic literature¹⁴. For confirmation, the Central National Herbarium (CNH), Howrah and Forest Research Institute Dehradun were consulted. Voucher specimens are preserved in the Herbarium of the Regional Research Laboratory, Bhubaneswar, Odisha.

RESULT AND DISCUSSION

The results of the ethno botanical survey are presented in table 1. A total of 69 plant species belonging to 43 families are reported. For each species the following ethno botanical information were provided: taxon name, family, vernacular name, plant parts used, locality, flowering season, fruiting season, voucher number, their use in treatment of diseases and habit of plant. Out of 69 plants recorded from study area, highest number of plants belongs to herb (25 species) and trees (25 sp.) followed by shrubs (9 sp.), climbers (6 sp.), small tree (3 sp.) and creeper

(1 sp.) in descending order (figure 2). In this study, members of the family Fabaceae were the most commonly used plants for the treatment of various diseases. Other families like Euphorbiaceae Lamiaceae, Verbanaceae, and Liliaceae were also dominant as shown in figure 3. Comparison of the plant parts used as a medicinal source indicates that the root predominates followed by leaf, bark, seed, stem, fruit, whole plant, flower, tuber, twig, and latex as shown in figure 4. The common diseases treated using medicinal plants are stomach ache, joint pain, scabies, lactation, rheumatism, infections, dysentery, diarrhoea, bleeding of nose, skin disease, migraine, snake bites, boils vomiting, fever, skin problems, cold & cough, toothache, stomach ache, wounds, burns, constipation, roundworms, fids weakness, leprosy, night blindness, blood dysentery, indigestion, diabetes, asthma and jaundice. Different types of preparation made from medicinally important plants included decoction, juice, powder, paste, oil and whole plant extract. Some plants were even used in more than one form of preparations. It is observed that in majority of cases a single plant is administered singly but for a good number of diseases also the recipe includes a combination of many plants and plant parts. At the same time it was seen that a single herbal recipe is effective for treatment of a number of ailments, which shows that a single plant is used for more than one ailment. The crude is either used singly or in combination with other materials of plant, animal or mineral origin. Such medicines are prepared under special method of heating, roasting, extraction with water, oil, milk, fat, or even animal urine, fermentation under specifically controlled condition or regulated grinding.

CONCLUSION

Herbal medicine has long been recognized as one of the oldest forms of remedies used by humans. Many people in

developing countries still rely on traditional healing practices and medicinal plants for their daily healthcare needs, in spite of the advancement in modern medicine. However, documentation of this indigenous knowledge of healing system still remains at minimum level. It thus becomes necessary to acquire and preserve this traditional system of medicine by proper documentation and identification of specimens. Combining concepts derived from the disciplines of agriculture, archaeology, biochemistry, genetics, horticulture, ecology, conservation biology, and botany, the field of ethno botany holds extraordinary promise for helping us to build a better future. Ethno botany can strengthen our links to the natural world. It is at once a vital key to preserving the diversity of plants as well as to understanding and interpreting the knowledge by which we are, and will be, enabled to deal with them effectively and sustainably throughout the world. The findings of this study predicted that, most of the medicinal plants (42.0%) used by the community of study area contain medical substances in the root, leaf and stem part of surveyed plants.

In conclusion, Nawarangpur district is a hub of medicinal plants as revealed in this study. However, there is need to scientifically ascertain the authenticity of the claimed use these plants.

Competing interest

The authors declare that they have no competing interests.

Authors' contributions

All authors have equal contribution for this work and all have read and approved the final manuscript.

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Table 1. List of plants of Nawarangpur district with their family name, local names, part used and traditional medicinal uses

Sl/No.	Taxon Name	Family Name	Vernacular name	Parts Used	Forest Pockets	Flowering season	Fruiting season	Herbarium voucher number	Ethno botanical uses	Growth Form
1	<i>Cycas circinalis</i> L.	CYCADACEAE	Arguna (O); Rengua (P).	Bark & Seed	Podagud a	May-Aug.	Sept.-Oct.	Dhal,10106	The bark and seeds are ground to a paste with mustard oil and applied on swellings	Small tree
2	<i>Cissampelos pareira</i> L. var. <i>hirsuta</i> (Burch.-Ham.ex DC.) Forman	MENISPERMACEAE	Akanbindi (O); Subudhibars o (K); Tamalo (G).	Root & Leaf	Kapur dam, Bijayapadar Podagud a.	Apr.-Aug	May-Oct.	Dhal & Brahman, 9587, 9599, 9210, 9321.	Powdered root and leaves mixed with ginger (<i>Zingiber officinale</i>) juice and honey (each 5 ml) is administered twice daily for 5 days against dry cough.	Herb
3	<i>Cocculus hirsutus</i> (L.) Diels	MENISPERMACEAE	Dahdahiya (O); Musakani (K); Karvada (B).	Root & whole plant	Bharsundi	Mar.-May.	Mar.-May.	Dhal & Brahman, 9782.	Plant decoction (2 tea spoonful, 2 times daily) is drunk as a cooling tonic to treat abdominal disorders. Root paste is taken thrice a day for liver dysfunction.	Herb
4	<i>Stephania japonica</i> (Thunb.) Miers	MENISPERMACEAE	Okanobindi (O); Akanabin di (P)	Root	Chikli	Oct.-Nov	Dec.-May	Dhal, 9156	Powdered root is administered along with honey in empty stomach to cure kurmi in case of child below 6 years.	Herb
5	<i>Hybanthus enneaspermus</i> (L.) F.v. Muell.	VIOLACEAE	Madanamast aka (O).	leaf	Indravati	June-Oct	June-Oct	Dhal & Brahman, 9770	Leaf decoction is administered once a day for one week to check	Herb

									bleeding piles	
6	<i>Casearia Graveolens</i> Dalz.	FLACOURTIACEAE	Kirchi (O); Reri, Rari (K).	Fruit	Bijayapadar.	Feb.-May	Apr.-May	Dhal & Brahman, 9051.	The crushed fruit paste is mixed in ponds, lakes to kill fishes.	Tree
7	<i>Calophyllum inophyllum</i> L.	CLUSIACEAE (GUTTIFERAE)	Polang (O); Alexandrian laurel (E).	Seed	Tentulikhunti	Oct.-Nov	Feb.-Apr	Dhal & Brahman, 9802.	Seed oil is used externally for scabies, eczema etc.	Tree
8	<i>Mesua ferrea</i> L.	CLUSIACEAE (GUTTIFERAE)	Nageswara (O).	Leaf	Papadahandi.	Mar.-May.	Oct. Nov.	Dhal & Brahman, 9803.	Powdered leaf are administered twice daily for one week against constipation	Tree
9	<i>Bombax ceiba</i> L.	BOMBACACEAE	Simili (O); Piraroda (P).	Seeds & root	Bijaya Padar hilly areas	Jan-Mar	Mar.-May	Dhal & Brahman, 9013.	A glass full of water (150 ml) in which the root (2' long) is soaked overnight is taken on empty stomach for 5 days against amoebic dysentery.	Tree
10	<i>Pterospermum Xylocarpum</i> (Gaertn.). Sant & Wagh	STERCULIACEAE	Kamala gundi, Muchukund (O); Gadigamcha (K).	Flower	Hattigam	Oct.-Dec	Apr.-May	Dhal, 9812.	5 gm of the flower paste in given twice a day for abdominal pain	Tree
11	<i>Tribulus terrestris</i> L.	ZYGOPHYLLACEAE	Gokhura (O); Sanghura (B).	Leaf	Sanatamara.	Mar.-June	July-Oct.	Dhal & Brahman, 9495.	Leaf juice (5ml) mixed with 10-15 drops of ginger juice (<i>Zingiber officinale</i>) is given twice a day for one week against ringworms.	Herb
12	<i>Garuga pinnata</i> Roxb.	BURSERACEAE	Mohi, Kathkumsum (O); Garuguda (P); Nijawa (K)	Leaf & fruit	Barli	Jan.-Mar.	Apr.-Aug.	Dhal & Brahman, 9114.	Leaf juice mixed with 2-3 ml leaf juice of Basanga (<i>Justicia adhatoda</i>) and honey (2 ml) is given twice a day for 2 weeks	Tree

									against asthma	
13	<i>Protium serratum</i> (Wall. ex Colebr.) Engl.	BURSERACEAE		Bark	Sanatem ara	Apr.- May	Apr.- May	Dhal 9501.	Bark paste is applied on scabies	Tree
14	<i>Celastrus paniculata</i> Willd.	CELASTRACEAE	Pengu (O);Kujari (K,G,P)	Seed	Singisari	Apr.- July.	May- Dec	Dhal 9446.	The seed oil is massaged against paralysis with hot water sponging.(Tree
15	<i>Xylia xylocarpa</i> (Roxb.) Taub.	CAESALPINIACEA E	Kongada (O);Tingan (K)	Seed	Barli	Apr.- May	Sept.- Dec	Dhal 9115.	Seed paste is administered thrice a day for 2 days against snake bite if the patient will be treated within 2 hours of the biting	Tree
16	<i>Butea superba</i> Roxb.	FABACEAE	Palasa noi (O); Morda (K); Budel(G)	Leaf	Pannaber a	Jan.-Mar	May-Oct	Dhal & Brahmam, 9360.	The bark paste (5 gm) is administered twice a day for 7 days against abortion	Small tree
17	<i>Clitoria ternatea</i> L.	FABACEAE	Aparajita	Root & flowe r	Raighara and Papadaha ndi	Sept.- Apr	Sept.- Apr	Dhal & Brahmam, 9285, 9245.	Root paste is locally used against snake bite	Climber
18	<i>Desmodium gangeticum</i> (L.)DC.	FABACEAE	Salparni (O).	Leaf	Singisari & Nabarang pur	May- July	Aug.- Oct.	Dhal 9479 & 9476.	Raw leaf juice is administered one teaspoonful two times daily in case of chronic dysentery	Herb
19	<i>Pueraria tuberosa</i> (Roxb. exWilld.) DC.	FABACEAE	Bhuikakharu (O); Marda tunga (K); Patal kurma (P); Pthal- badra (G)	tuber s	Hattigam.	Feb.- Mar	Apr.- Aug.	Dhal, 9060.	Dried tuber powder mixed with dried anthers of <i>Musa paradisiaca</i> is taken once a day for 15 days to increase lactation after post delivery.	Climber
20	<i>Tephrosia purpurea</i> (L.) Pers.	FABACEAE	Kulathia ,Bana kultha (O); Uttar	Leaf & root	Chandah andi and Indravati	Aug.- Sept.	Oct.- Nov.	Dhal & Brahmam, 9339,	Leaf juice mixed with curd is given to check loose motions	Herb

			(K); Daida (G)					9429.	Root paste is locally applied on chest to relieve from chest pain	
21	<i>Terminalia arjuna</i> (Roxb.ex DC.) Wight. & Arn.	FABACEAE	Arjuna (O); Hatana (K); Kahua (B)	Bark & stem	Bijayapadar	May-Aug.	Sept.-Dec.	Dhal & Brahman, 9609.	Stem decoction with goat milk is given to women (3:2) against debility	Tree
22	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	FABACEAE	Bahada (O); Lupurg (K)	Fruit, bark & stem	Raighara	Feb.-Mar.	Apr.-Aug.	Dhal & Brahman, 9297.	The fruit juice mixed with Rasi (<i>Sesamum orientale</i>) is applied regularly for 1-2 months to check graying of hair	Tree
23	<i>Diospyros melanoxylon</i> Roxb.	EBENACEAE	Kendu (O); Duringi (K); Terel (G).	Flower	Birijadahada.	Apr-May	Feb.-Mar.	Dhal & Brahman, 9600.	Flower powder (10 gm) mixed with black pepper (<i>Piper nigrum</i> L.) 3:2 is taken twice a day for 15 days against leucorrhoea.	Tree
24	<i>Symplocos racemosa</i> Roxb	SYMPLOCACEAE	Ludho (O); Ludam (P).	Stem & bark	Pannabera.	Oct.-Jan	Feb.-May	Dhal & Brahman, 9567.	Stembark decoction with honey (3:2) is given to children below 10 years against liver complaints	Tree
25	<i>Nyctanthes arbor-tristis</i> L.	OLEACEAE	Gangaseoli, Singharar (O); Dokkedi (K); Charisiri (B); Sihara (G).	Stem, bark & seed	Nabarangpur	Sept.-Feb.	Sept.-Feb.	Dhal, 9577.	Dried seed powder with Brassica oil is locally applied for removal of dandruff	Tree
26	<i>Holarrhena pubescens</i> (Buch.-Ham.) Wall.	APOCYNACEAE	Kurchi, Kurmi (O); Kurchi (K); Kuar (B).	Stem, bark & root	Bijaypada r.	May-July	Sept.-Nov	Dhal & Brahman, 9105.	Stem bark decoction with honey is given twice a day for 10 days against glandular tumours 5 ml of root juice is taken	Tree

									twice a day for 7 days against neurological disorders	
27	<i>Rauvolfia tetraphylla</i> L.	APOCYNACEAE	Patal garud (O).	Root	Umerkote.	Most part of the year	Most part of the year	Dhal, 9181.	Decoction of stem bark with black pepper (<i>Piper nigrum</i> L.) is given twice a day for 7 days against pneumonia	Shrub
28	<i>Wrightia tinctoria</i> (Roxb.) R. Br.	APOCYNACEAE	Pita karuan (O); Set kure (K); Dhuba kure (G).	Latex & root	Pannabera	Mar.-May	June-Oct.	Dhal & Brahman, 9555	Latex with mustard oil (2:1) is locally applied for paralysis	Tree
29	<i>Hemidesmus indicus</i> (L.) R. Br	APOCYNACEAE	Anantamula, Dudhi (O); Trajamala (K); Godmela (B); Indian Sarsaparilla (E).	Root & leaf	Nabarangpur.	Aug.-Oct	Dec.-Mar.	Dhal, 9456.	Root powder with cow milk is used for nervous weakness	Creeper
30	<i>Strychnos nux-vomica</i> L.	STRYCHNACEAE	Kochila (O); Kuchla (K,G,P); Nuxvomica (E).	Bark & seed	Podagoda.	Feb-Apr.	July-Oct	Dhal, 9919	Bark paste (3 gm) is given to children once a day after dinner for one week against bedwetting	Tree
31	<i>Swertia angustifolia</i> Buch.-Ham. ex D.Don	GENTIANACEAE	Chireta (O); Bonga marchi (K); Marchi (P).	Root	Dabugan.	Oct.-Dec.	Oct.-Dec.	Dhal & Brahman, 9940.	5 ml root juice is given once a day for 3 days against throat infection	Herb
32	<i>Argyreia nervosa</i> (Burm.f.) Boj.	CONVOLVULACEAE	Munda noi (O); Gagudi (K); Marang (B).	Root & whole plant	Pipladongar.	Aug.-Sept	Oct.-Dec	Dhal, 9938.	Powdered root with cow milk (2:1) is given twice a day for 15 days against painful discharge of urine.	Climber
33	<i>Evolvulus alsinoides</i> (L.) L.	CONVOLVULACEAE	Bichhamalia (O); Tandi		Pannabera.	July-Feb	July-Feb	Dhal, 9558.	Plant decoction is given twice a day for 3 days	Herb

			kode (G).						aganist dysentery	
34	<i>Cuscuta reflexa</i> Roxb.	CUSCUTACEAE	Nirmuli (O); Jansing (K).	Whole plant	Nabarang pur	Oct.-Jan	Oct.-Jan	Dhal & Brahmam, 9110.	Plant paste mixed with the paste of Ginger (<i>Zingiber officinale</i> Rosc.) is massaged locally to relieve from chest pain.	Climber
35	<i>Datura metel</i> L.	SOLANACEAE	Kala dudura, Dudura (O); Dudura (P).	Seed		Sept.- May	Sept.- May	Dhal, 9404.	Seed paste with <i>Pongamia</i> oil (2:1) is externally used for leucoderma	Shrub
36	<i>Oroxylum indicum</i> (L.) Vent	BIGNONIACEAE	Phemphana (O); Dhan grikhara (K); Pampena (P).	Stem, bark & seed	Singisari.	July- Aug.	Oct.- Mar.	Dhal, 9995.	Stembark boiled in Kusum (<i>Schleichera oleosa</i> (Lour.) Oken. seed oil and used as massage oil in case of leucoderma	Tree
37	<i>Stereospermum chelonoides</i> (L.f.) DC	BIGNONIACEAE	Padal (O); Hussi (K).	root	Podagud a.	Mar.- May.	Aug.-Oct	Dhal, 9205.	Decoction of the root (10 ml) is given twice daily for one month against asthma.	Tree
38	<i>Martynia annua</i> L.	MARTYNIACEAE	Bagha nakhi (O); Banasarsar (B); Bilai sarsar (P).	Seed	Nabarang pur, Behe da	Aug.- Sept	Oct.- Dec.	Dhal & Brahmam, 9098. K.S. Murty s.n. (Acc.no- 2322)	Seed oil is externally applied in case of rheumatism and spondylitis	Herb
39	<i>Andrographis paniculata</i> (Burm.f.) Wall. ex Nees in Wall.	ACANTHACEAE	Bhuineem (O); Resan (G); Kalmesh (K); Bhuing kara	Leaf & root	Pannaber a, Beheda	Sept.- Mar	Sept.- Mar	Dhal & Brahmam, 9553, 9331.	10 ml leaf juice is prescribed twice a day for 5 days against colic pain.	Herb
40	<i>Hygrophila auriculata</i> (Schum.) Heine	ACANTHACEAE	Koilikhia (O); Koili kanta (P).	Root	Raighara	Oct.- Feb.	Oct.- Feb.	Dhal, 9377	About 10 gm of dried root powder mixed with milk is given twice a day	Herb

									to remove kidney stones	
41	<i>Clerodendrum serratum</i> (L.) Moon	VERBENACEAE	Penjura (O); Saram lutar (K); Budagocha (P).	Root & leaf	Umerkote, Beheda	Sept.-Nov	Sept.-Nov	Dhal, 9278.	Leaf paste mixed with castor oil (<i>Ricinus communis</i>) is massaged on the breast against breast pain.	Shrub
42	<i>Clerodendrum viscosum</i> Vent.	VERBENACEAE	Madhvi (O); Kalamedhi (K); Chamgar (G).	Leaf	Telia	Jan.-Mar	Apr.-June	Dhal, 9722.	Paste prepared with 4 leaves and 8 black peppers (<i>Piper nigrum</i>) is externally applied twice daily for 7 days against swollen legs	Shrub
43	<i>Vitex negundo</i> L.	VERBENACEAE	Begunia, Nirgundi (O); Sinduari (K); Sursing (G).	Twigs	Raighara	Aug.-Dec	Aug.-Dec	Dhal & Brahman, 9504.	Leaf paste made with rice is rubbed against chest pain	Small tree
44	<i>Colebrookea oppositifolia</i> Sm. Exot.	LAMIACEAE	Marang (G, B).	Leaf & flower	Kapur dam, Podagoda dam and Indravati.	Nov.-Apr	Nov.-Apr	Dhal, 9582, 9439, 9041.	Leaf paste is applied externally against rheumatic joint pain	Herb
45	<i>Leonotis nepetifolia</i> (L.) R. Br	LAMIACEAE	Kanta sidha (O); Janum dhimpo (G, P).	Seed paste	Beheda	Sept.-Jan	Sept.-Jan	Murthy, s.n. (Acc.no. 2319).	The seed paste boiled in karanja oil (<i>Pongamia pinnata</i>) is externally massaged against breast swellings.	Herb
46	<i>Ocimum canum</i> Sims	LAMIACEAE	Bantulsi (O); Hundi pung (K); Goda tulsi (P).	Leaf	Bijayapadar	July-Mar	July-Mar	Dhal & Brahman, 9057.	Leaf decoction with common salt (2:1) is administered twice a day for 7 days against viral fever	Herb
47	<i>Boerhavia diffusa</i> L.	NYCTAGINACEAE	Purunisago (O);	Whole	Chikli	Mar.-July	Mar.-July	Dhal & Brahman,	Whole herb is crushed and mixed with 100 ml of	Herb

			Khaprusago (P); Kenchua (K).	plant				9151.	water (in which rice is washed). This mixture is taken twice a day for 3 days against menorrhagia	
48	<i>Achyranthes aspera</i> L.	AMARANTHACEAE	Apamaranga (O); Rusabaduli (K); Chirchiri (P).	Root	Nabarangpur, Behera	Oct.-Dec.	Oct.-Dec.	Dhal & Brahman, 9704. K.S.Murty s.n. Acc.no-2287.	Root paste with cold water is administered twice a day for 3 days against burning sensation of urination.	Herb
49	<i>Aristolochia indica</i> L.	ARISTOLOCHIACEAE	Gopa kanna, Panairi (O).	Leaf	Kodinga	Aug.-Nov	Dec.-Mar	Dhal, 9969.	The leaf juice (10 ml) is given twice a day for 5 days against bronchitis	Climber
50	<i>Piper nigrum</i> L.	PIPERACEAE	Gol mirch (O); Marich (K); Black pepper (E).	fruit	Dasarathpur	Oct.-May.	Oct.-May.	Dhal, 9165.	The fruit powder (10 gm) is taken thrice a day for 15 days against arthritis.	Herb
51	<i>Dendrophthoe falcata</i> (L.f.) Etting	LORANTHACEAE	Madang (O); Malang (P); Vahalia-banda (K).	Bark	Pannabera	Oct.-Apr.	Oct.-Apr.	Dhal, 9367, 9711.	Bark juice (5 ml) mixed with powdered paste of Mahul flower (<i>Madhuca indica</i>) is given twice a day for 7 days after 3 days of menstruation period, as contraceptive	Shrub
52	<i>Acalypha indica</i> L.	EUPHORBIACEAE	Indian Acalypha (E).	Leaf	Bijayapadar	Feb.-Sept.	Feb.-Sept.	Dhal, 9107.	10 ml of the leaf juice is taken twice a day for 5 days against bronchitis	Herb
53	<i>Euphorbia tirucalli</i> L.	EUPHORBIACEAE	Siju (O).	Root	Dabugan	July-Oct.	July-Oct.	Dhal & Brahman, 9996.	The root juice (10 ml) is given for 15 days to nursing mother to enhance lactation	Shrub
54	<i>Mallotus philippensis</i> (Lam.) Muell.-Arg.	EUPHORBIACEAE	Sinduri (O); Sendrunji	Root &	Pannabera,	Oct.-Apr.	Oct.-Apr.	Dhal, 9333. K.S.Murty	Root bark paste is used to treat rheumatoid	Tree

			(K); Gara sinduri (P,G).	bark	Hattigam			s.n. (Acc.no-2326)	arthritis.	
55	<i>Ricinus communis</i> L.	EUPHORBIACEAE	Jada (O); Bada (K,P) Castor (E).	Seed	Bijayapadar	Jan.-May	Jan.-May	Dhal & Brahman, 9090	The seed oil is massaged on the swellings of rheumatic joints	Shrub
56	<i>Tragia involucrata</i> L.	EUPHORBIACEAE	Bichhuati (O); Sengelsing (K); Jipenda (B).	Root & leaf	Mohara	Sept.-Oct.	Nov.-Apr	Dhal, 9343.	Leaf juice (5ml) is given twice a day for 7 days for whooping cough	Herb
57	<i>Vanda tessellata</i> (Roxb.) Hook.	ORCHIDACEAE	Malang (O); Gaccho janaya (K); Khurgasar (G).	Root	Kangada	Mar.-Apr.	May-Nov.	Dhal, 9490.	Root decoction with common salt (2:1) is administered twice a day for 7 days against hepatitis	Shrub
58	<i>Dioscorea bulbifera</i> L.	DIOSCOREACEAE	Pita-alu, Pita-kanda (O); Pisika (G).	Tuber	Singisari	Aug.-Sept.	Nov.-Mar	K.S. Murty s.n. (Acc. No. 2396).	The juice of the tuber (5 ml) is taken after lunch for 15 days against hypertension	Herb
59	<i>Gloriosa superba</i> L.	LILIACEAE	Nanangalia (O); Lauri-Kuli (K); Dasaruphulo (P).	Root	Nabarangpur	Aug.-Sept	Oct.-Feb	Dhal, 9261.	The root juice (5 ml) is taken after meal twice a day for 10 days against constipation	Herb
60	<i>Smilax zeylanica</i> L.	SMILACACEAE	Mutri, Ramdatuni (O); Atakiri (K); Ranpawan (G,B).	Root	Raighara.	July-Aug	Sept.-Nov	Dhal, 9315.	The root powder (5 gm) mixed with 5 gm of ginger (<i>Zingiber officinale</i>) is given once a day for 1 month against chronic leucorrhoea.	Climber

61	<i>Barringtonia acutangula</i> (L) Gaertn	BARRINGTONIACEAE	Hinjal (O);Dundi (K)	Leaf, stem & bark	Barli.	May-June	Sept.-Oct.	Dhal, 9695.	Stem bark decoction 2 tsp. is drunk twice a day for 3 days against diarrhoea	Tree
62	<i>Careya arborea</i> Roxb.	BARRINGTONIACEAE	Kumbhi (O);Asanda (K,B)	Leaf, stem & bark	Podagud a.	Apr.-May.	June-Oct.	Dhal, 9871.	Stem bark mixed with Neem oil is locally applied in case of leucoderma	Tree
63	<i>Woodfordia fruticosa</i> (L.) Kurz,	LYTHRACEAE	Dhatki (O);Icha (K); Phuldawai (P)	Fruit	Podagud a	Apr.-May	Apr.-May	Dhal & Brahman, 9188.	Unripe fruit paste (5 gm) is given twice daily for 7 days against indigestion	Shrub
64	<i>Centella asiatica</i> (L.) Urban	APIACEAE(UMBELLIFERAE)	Thalkudi (O);Thalkuri (P)	Whole plant	Bijayapadar.	Most part of the year.	Most part of the year.	Dhal, 9070.	Plant decoction mixed with cow milk in 1:5 ratio is taken for 15 days against asthma	Herb
65	<i>Alangium salvifolium</i> (L.f.) Wang.	ALANGIACEAE	Ankula (O);Akel (K); Dhela (G, B).	Root, twig & bark	Bijayapadar.	Mar.-Apr	May-July.	Dhal, 9088.	Root bark paste (5gm) mixed with 7 blackpeppers (<i>Piper nigrum</i>) is administered twice a day for 10 days against hepatitis.	Tree
66	<i>Haldinia cordifolia</i> (Roxb.) Ridsd.	RUBIACEAE	Kaim, Maldu (O); Girta (K).	Bark	Bijayapadar.	June-July	Nov.-Mar.	Dhal, 9083.	Bark paste is locally applied for scabies	Tree
67	<i>Mitragyna parviflora</i> (Roxb.) Korth.	RUBIACEAE	Mundi (O); Krambangi (K).	Root & bark	Bijayapadar.	Apr.-May	Sept.-Oct	Dhal & Brahman, 9073.	Root bark decoction 5 gm is taken once a day against night blindness	Tree
68	<i>Elephantopus scaber</i> L.	ASTERACEAE	Mayurchulia (O); Totachero (K); Chotarasna (P).	root	Jharigan.	Sept.-Feb	Sept.-Feb	Dhal, 9230.	Root decoction (5ml) mixed with 3 black pepper (<i>Piper nigrum</i>) is taken once a day for 7 days against gonorrhoea	Herb

69	<i>Plumbago indica</i> L.	PLUMBAGINACEAE	Rakta chitaparu, Ranga chitaparu (O); Chitaparu (K).	Stem & bark		Dec.- Mar	Dec.- Mar	Dhal, 9915.	Stem bark paste is locally applied on anus in case of external piles	Herb
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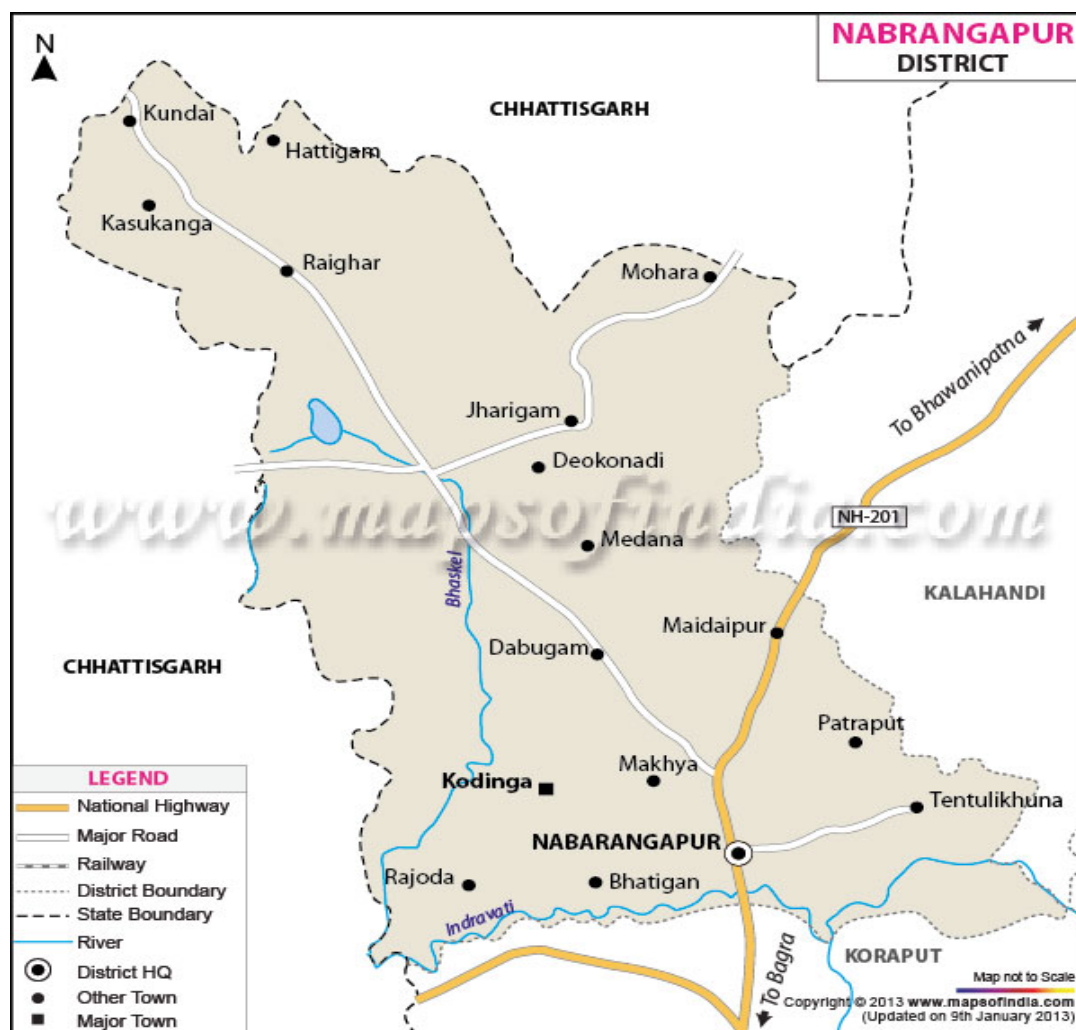


Figure 1. Location map of the study area

Source: www.mapsofindia.com

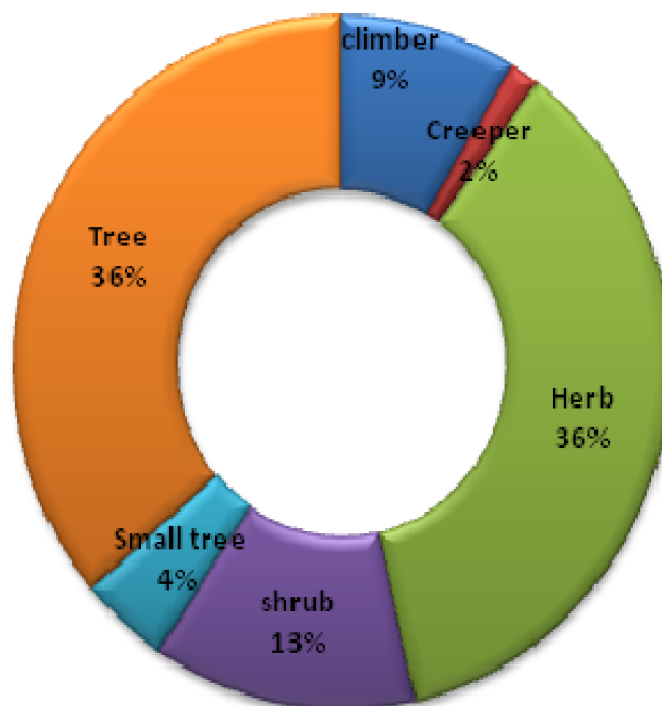


Figure 2. Habit wise analysis of documented plants

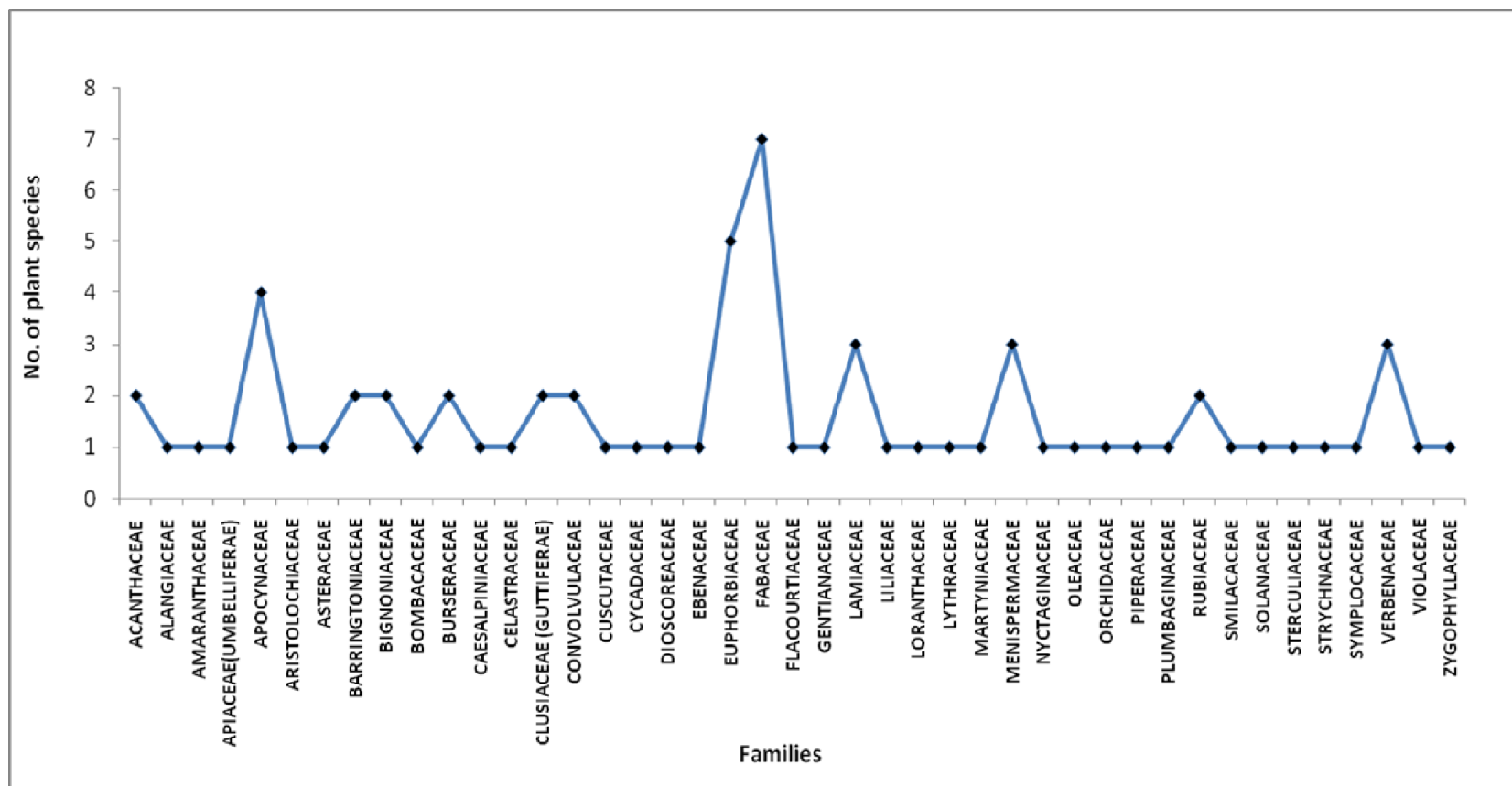
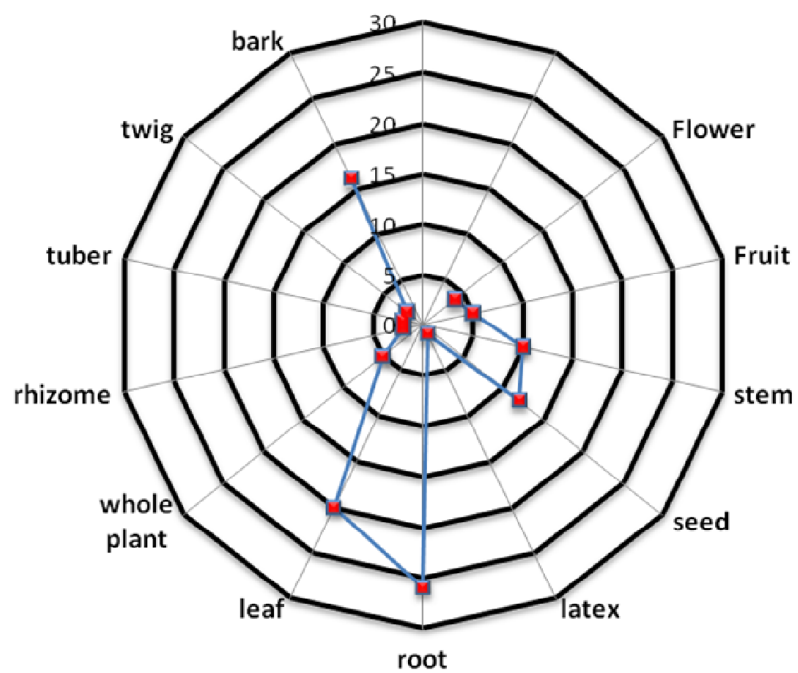


Figure 3. Distribution of plants species according to their families



Percentage of plant parts used

Figure 4. Percentage of plant parts used