

## Ethnobotanical Investigation of Medicinal Plants used by Rural Communities of District Chatra, Jharkhand, India

Rajnandani Kumari<sup>1</sup>, Anil Kumar<sup>2</sup> and Baidyanath Kumar<sup>3</sup>

<sup>1</sup> & <sup>2</sup>: Department of Botany, Magadh University, Bodh Gaya- 824231

<sup>3</sup>: Academic Director, Life Science Research Centre, Patliputra Patna-800001

Corresponding Address: Dr. Baidyanath Kumar

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**Abstract:** Ethnobotany is the branch of life science which deals with the study of the dynamic relationship between plants and people. In Chatra district majority of people live in rural areas. In almost all villages there is one or more traditional herbal practitioners locally called Kavirajas or Vaidyas. The main objective of this study is to document the species of medicinal plants used by tribal and non-tribal communities of Chatra. Plant parts used for treating various diseases and their mode of administration were determined. The use values of plant species were also computed. A total of 60 informants were interviewed regarding the medicinal plants utilized for treating diseases. Medicinal plants were identified following standard monograph.

It was observed that the differences in educational status of informants did not have significant impact on the knowledge on indigenous medicinal plants. It was also observed in the present survey that their knowledge of medicinal plants was passed down from their ancestors through oral traditions. A total of 134 species of medicinal plants belonging to 115 families of flowering plants have been documented to be used by rural, tribal and non-tribal communities from twelve blocks of Chatra district (Jharkhand). The most representative family was Fabaceae with 16 species, followed by Asteraceae (10 species), Euphorbiaceae (6 species), Caesalpiniaceae, Lamiaceae, Mimosaceae and Solanaceae (5 species each). Acanthaceae, Combretaceae and Malvaceae were represented by only four species of medicinal plants. Other plants included least number of medicinal plants.

The use value of the present medicinal plants was also computed to quantify the importance of specific plant species. It was found that the 88 plant species had lowest use value < 0.200. The use value of *Mesua ferra*, *Saraca indica*, *Aloe vera*, *Coleus barbetus*, *Psidium guajava* and *Piper betel* was 0.527, 0.521, 0.521, 0.511 and 0.561 respectively and, therefore, considered to be the most important medicinal plant species of district Chatra.

It can be concluded that the knowledge and usage of conventional medicine for the treatment of various diseases among the rural, tribal and non-tribal communities is still a major part of their life and culture.

**Key words:** Ethnobotany, Medicinal plants, Chatra district, Use value, Traditional medicine

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### I. Introduction

Ethnobotany is the branch of life science which deals with the study of the dynamic relationship between plants and people (Robert Voeks, 2017) [1]. It traces its early history to the colonial quest for precious spices such as cinnamon, clove, nutmeg, and other tropical treasures. As colonial merchants and settlers unwittingly spread tropical microbes, the search expanded to botanical remedies for the flotilla of new and geographically expanding diseases. Entrepreneurs of science sought fame and profit as they scoured these newfound lands for “green gold,” and so was born the ethnobotanical enterprise (Robert Voeks, 2017) [1].

The development of Ethnobotany has challenged the prevailing trend in academic studies of the twentieth century of disciplinary specialization. Ethnobotany reflects congruence with our human efforts to understand our place in the world, and is considered parallel to other interdisciplinary fields such as environmental history, political ecology, cultural ecology, environmental ethics, ecological economics and ecological restoration. Ethnobotany is greatly linked to taxonomy, nutrition, pharmacognosy, phytochemistry, palynology, ecology and conservation biology (Nolan and Turner, 2011) [2].

Ethnobotanists have a deep interest in human adaptations and innovations, which allow some people to live in places where many others would not be able to survive. They believe that the collective environmental knowledge of humanity is essential effort to conserve the biodiversity of earth and have helped us to identify the close correspondence between the earth’s biological diversity and its cultural diversity (Wade Davis, 2001; Carlson and Maffi, 2004) [3, 4]. Regions of high biological diversity correlate with the regions of highest linguistic and cultural diversity (Stepp *et al.*, 2005) [5].

Chatra is one of the twenty-four districts of State Jharkhand, India. This district covers an area of 3706 km<sup>2</sup>. In 2011, Chatra had population of 1,042,886 of which male and female were 533,935 and 508,951 respectively. According to the 2011 census this district has a population of 1,042,304 of which male and female are 533,935 and 508,951 respectively. The district has a population density of 275 inhabitants per square kilometre (710/sq mi). Its population growth rate has been estimated to be 28.98%. Chatra has a sex ratio of 951 female for every 1000 males, and a literacy of 98.5%. Chatra district includes 12 blocks viz. Chatra, Kunda, Hunterganj, Pratappur, Lawlong, Gidhour, Pathalgada, Simaria, Tandwa, Itkhori, Kanhachatti and Mayurhand. It is situated at coordinates 24.1526° N, 84.8568° E; latitude 24.2033393 (24° 12' N) and longitude 84.879994 (84° 56' E). Jharkhand has a tropical climate with annual average rainfall of 900 mm and temperature varies between 4<sup>0</sup>C to 47<sup>0</sup>C. The forest area is 23,605 Km<sup>2</sup> which is 29.61% of its geographical area. The reserved forests constitute 18.58%, protected forests 81.28% and unclassified forests 0.14%. It has one National Park and eleven Wildlife Sanctuaries covering an area of 2,182.15Km<sup>2</sup> constituting 2.74% of the total geographical area of the state. The forest cover of Jharkhand is 22,997 Km<sup>2</sup>. In terms of forest density canopy classes, the state has 2,590 Km<sup>2</sup> areas under very dense forest, 9,917 Km<sup>2</sup> areas under moderately dense forest and 10,470 Km<sup>2</sup> areas under open forest. The tree cover of the state is 2,914 Km<sup>2</sup> covering 3.66% of the geographical area (India State of Forest Report, 2011). District Chatra has a Total Forest Cover (TFC) of 1,777 Km<sup>2</sup>, of which Very Dense forests (VDF) constitute 251 Km<sup>2</sup>, Moderately Dense Forests (MDF) 863 Km<sup>2</sup> and Open Forest (OF) 663 Km<sup>2</sup> covering 47.62% of its total geographical area. The state has five forest types which belong to two forest type groups' viz. Tropical Moist Deciduous and Tropical Dry Deciduous forests.

The traditional knowledge held by regional peoples is an important resource that should be conserved. This knowledge continues to decline through time and there are only few indigenous, rural communities with wide traditional and botanical knowledge. Medicinal plants have played a significant role in maintaining human health and improving the quality of life for thousands of years and have served as valuable components of medicines, food, beverages, cosmetics, dyes and others (Chopra *et al.*, 2006; Jain, 1991; Dananjeyan and Bama, 2010; Pradhan and Rahman, 2011; Mondal and Rahman, 2011; Marandi *et al.*, 2015) [6, 7, 8, 9, 10].

In Chatra district majority of people live in rural areas. In almost all villages there is one or more traditional herbal practitioners locally called Kavirajas or Vaidyas. These traditional herbal practitioners efficiently treat various diseases. Apart from traditional practitioners, peoples of tribal communities give some folklore medicines. The knowledge of ethnomedicine has been carried out from generation to generation among ethnic people orally and the medicinal plants survived in their minds and soul. A considerable ethnomedicinal works has been carried out by ethnobotanists on Jharkhand state (Hembrom, 1991; Singh, 2008; Tudu and Sinha, 2007) [12, 13, and 14]. But no serious effort has been made regarding the ethnomedicinal importance of medicinal plants of Chatra district of Jharkhand and hence the present investigation was undertaken. The present investigation is aimed to highlight the traditional uses of medicinal plants surveyed in Chatra district.

## II. Materials and Methods

**Study Sites:** The ethnobotanical survey was conducted in the twelve blocks of Chatra district viz. Chatra, Kunda, Hunterganj, Pratappur, Lawlong, Gidhour, Pathalgada, Simaria, Tandwa, Itkhori, Kanhachatti and Mayurhand among peoples of tribal and non-tribal communities (male, female, educated and illiterate individuals) of different age groups from January to December 2018 (Figure-1).



Figure-1: Map of Chatra district Jharkhand (Google Map, 2019)

**Data Collection:** Data were collected through a semi-structured interview of 60 informants of each of the twelve blocks of Chatra district who are knowledgeable on medicinal plants. Informants were composed of the tribal chieftains, traditional healers and community elders. This semi-structured interview was composed of questions on medicinal plants, its utilization as traditional medicine, the diseases treated by the plants, the plants used for various diseases, the parts used, how the parts of plant consumed.

**Specimen Collection:** The medicinal plants and their parts were collected and identified following standard monograph (Haines, 1921-1925). The habitat, morphological characteristics, and reproductive parts of the plants were recorded. Herbaria of each specimen were prepared and preserved in laboratory, Department of Botany, Magadh University, Bodh Gaya.

**Data Analysis:** The information on the tribal and non-tribal individuals of Chatra with special reference to socio-demographic profile and on the medicinal plants was based on the interview. The use value was calculated to quantify the ethnobotanical data gathered. The Use Value was determined by the method suggested by Polat *et al.*, 2015) [16]. It is defined as the ratio of the number citations per species (U) to the number of informants (N) and is given by the formula:  $UV = U/N$ . High UV indicates high use-reports for a plant implying its relative importance to the local community. Low UV indicates few reports related to its use (Abe *et al.*, 2013; Abu-Irmaileh and Afifi, 2003; Tekleymanot and Giday, 2007) [17, 18, 19].

### III. Results

A total of 60 informants selected from twelve blocks of Chatra district (five respondents from each block) participated in the ethnobotanical surveys have been presented in Table-1. The informants were selected on the basis of their knowledge on the medicinal plants they used. The average number of plant species cited by all of the informants was 25.

**Table-1: Demographic profiles of the interviewed respondents in 12 blocks of Chatra**

Blocks	Number of respondents	Average age group			Gender		Educational attainment		
		18-30	31-50	50-Up	Male	Female	Elementary	High School	Graduate
Chatra	5	1	2	2	3	2	1	3	1
Kunda	5	1	1	3	3	2	1	3	1
Hunterganj	5	0	1	4	4	1	1	3	1
Pratappur	5	0	1	4	2	3	1	3	1
Lawlong	5	1	2	2	1	4	3	2	0
Gidhour	5	1	2	2	1	4	3	2	0
Pathalgada	5	0	3	2	4	1	3	1	1
Simaria	5	0	3	2	3	2	3	1	1
Tandwa	5	1	1	3	1	4	2	2	1
Itkhori	5	1	1	3	1	4	2	2	1
Kanhachati	5	1	1	3	1	4	1	2	2
Mayurhand	5	0	1	4	3	2	1	2	2
Total	60	7	19	34	27	33	22	26	12

From the results it was observed that the differences in educational status of informants did not have significant impact on the knowledge on indigenous medicinal plants. It was also observed in the present survey that their knowledge of medicinal plants was passed down from their ancestors through oral traditions. When rural, tribal and non-tribal communities of Chatra encounter diseases, they use medicinal plants first. When their traditional herbal medicines can no longer cure the diseases, they use other medicines or go to the block hospital for consultation and treatment.

The use of traditional herbal medicine is an integral part of healthcare of the tribal and non-tribal communities of Chatra district of Jharkhand. The result the present investigation is limited because of the small number of informants. However, the reliability of informants for ethnobotanical studies was followed based on the recommendations of ethnomedicinal formulations used by traditional herbal practitioners of Ranchi (Chandra *et al.*, 2007) [20]. It was observed that most of the traditional healers belong to the older generation of age group 50 and more. The respondents of age group 18-30 years had little knowledge about medicinal plants. This indicates a decline in knowledge of the use of medicinal plants that pose a potential disappearance of this ancestral knowledge in the future. There were more women informants (33) in this ethnobotanical survey compared to men (27). More medicinal plant species were cited by the women informants. This is because the majority of traditional healers among tribal and non-tribal communities in Chatra were women.

The medicinal plants collected from all the twelve blocks of Chatra, their vernacular names, parts used, mode of administration, use value and diseases treated have been presented in Table-2.

**Table-2: Medicinal plants of Chatra**

Family	Scientific name	Vernacular names	Plant parts used	Mode of administration	Diseases/Ailment to be treated	Use value
Acanthaceae	<i>Adhatoda vasica</i> (Linn) Nees	Vasaka	Leaves	Leaf decoction orally	Cough, Fever, Stomachache, Tuberculosis, Malaria, Constipation, Sprain	0.355
Acanthaceae	<i>Andrographis paniculata</i> (Burm.f.) Nees	Serpentina	Leaves	Leaf decoction orally	Cough, diarrhea, stomach ache	0.111
Amaranthaceae	<i>Achyranthus aspera</i> . Linn.	prickly chaff flower, Apamarga, Chirchiri	Leaves, seeds, Flower spikes	Apply decoction to affected parts	Dropsy, hydrophobia, snake bites, ophthalmia and cutaneous disease	0.035
Acoraceae	<i>Acorus calamus</i> Linn.	sweet flag or calamus	Root	Root decoction	Gastrointestinal problem including ulcers, inflammation, gastritis, intestinal gas (flatulence), rheumatoid arthritis and stroke	0.131
Asclepiadaceae	<i>Calotropis procera</i> (Ait) R. Br	Aak, Madar	Leaf latex, roots	Bark powder, leaf sap and latex	Emetic, cathartic and digitalic properties, leprosy and elephantiasis, snakebites, asthma	0.114
Asclepiadaceae	<i>Gymnema sylvestre</i> R. Br.	Gurmer ; destroyer of sugar (Madhumeh Nasak)	Leaves	Leaf extract	Anti-diabetic properties; lower blood sugar	0.112
Anacardiaceae	<i>Buchananea latifoli</i> Roxb.	Chirouli nut; Chirounji	Roots, leaves, fruits	Leaf decoction, fruits, root powder	Stringent, cooling, depurative properties, useful in treatment of diarrhea, skin diseases, cough and asthma.	0.113
Anacardiaceae	<i>Semecarpus anacardium</i> L. f.	Marking nut tree, Phobi nut tree and Varnish tree	Leaves, flowers, seeds	Decoction, extract	Cardiac stimulant, enhancer of white blood cells and used to cure cardiac debility. Bhallataka is good for both male and female reproductive systems, in women it stimulates uterus due to its hot potency. In men it is used for improving sperm count and sexual power.	0.115
Anacardiaceae	<i>Mangifera indica</i> L.	Aam	Various parts including fruits	Fruit juice and powdered seeds	Used as a dentifrice, antiseptic, astringent, diaphoretic, stomachic, vermifuge, tonic, laxative and diuretic and to treat diarrhea, dysentery, anaemia, asthma, bronchitis, cough, hypertension, insomnia, rheumatism, toothache, leucorrhoea, haemorrhage and piles.	0.114
Apocyanaceae	<i>Catharanthus roseus</i> (Linn.) Don	Sadabahar, Periwinkle	Leaves, flowers, roots	Leaf decoction, root powder	Treatment of muscle pain, depression of central nervous system, wasp stings, heals wounds, diabetes. Alkaloids used in the treatment of cancer.	0.115
Apocyanaceae	<i>Nerium indicum</i> Mill.	Kaner	Stem, leaves, flowers	Leaf and stem extracts; flower dye	cardiac illnesses, asthma, corns, cancer, and epilepsy, a green dye from the flower is used in the treatment of skin diseases and also possess wound healing and anti-inflammatory property, hot water extract of the leaves and seeds are used for upper respiratory tract and gastrointestinal infections, juice from the stem bark is used to cure ear pain	0.113
Apocyanaceae	<i>Rauwolfia serpentina</i> (L.) Benth. Ex Kutz	Indian snakeroot, devil pepper, or serpentine wood	Leaves, stem, flowers, roots	Extracts of plant parts that contain many alkaloids	high blood pressure and mental illness; reserpine has been used to treat mild to moderate high blood pressure, schizophrenia, and some symptoms of poor circulation.	0.115
Apocyanaceae	<i>Tabernaemontana coronaria</i> R. Br.	Tagar, Crape Jasmine	Leaves, flowers, roots	Milky juice of leaves; flower; root extract	Milky juice of leaves shows anti-inflammatory activity; applied to wounds. Flowers mixed with oil used in skin diseases. Root extract relieves toothache, also used as a vermicide.	0.015

Apiaceae	<i>Centella asiatica</i> (Linn.) Urban	Gotu kola, Bramhani buti	Leaves	Leaf decoction orally	Repair of nervous tissue due to spinal injury, neuromuscular disorder, skin treatment.	0.121
Apiaceae	<i>Cuminum cyminum</i> L.	Jeera	Seeds	Seed paste	Treatment of respiratory problems, allergic rhinitis, dyspepsia, metabolic syndrome, diabetes mellitus, inflammatory diseases, different types of human cancer, dyslipidemia, hypertension	0.112
Asparagaceae	<i>Chlorophytum tuberosum</i> (Roxb.) Baker	Safed musli	Leaves and roots	Leaf decoction, Dried root, tubers	Popular tonic and aphrodisiac, crushed tubers used to treat guinea-worm	0.111
Asteraceae	<i>Saussurea lappa</i> Decne.	Kooth root	Leaves and roots	Leaf decoction, root powder	Used for carminative, aphrodisiac, anthelmintic, tonic, stimulates the brain; used in diseases of liver, kidney and blood; also used for treating deaf, headache, paralysis, asthma, cough, old fever, inflammation, and ophthalmic conditions	0.012
Asteraceae	<i>Sphaeranthus indicus</i> L.	Globe Thistle	Whole plant	Decoction and powder	Used to treat vitiated conditions of epilepsy, mental illness, hemicrania, jaundice, hepatopathy, diabetes, leprosy, fever, pectoralgia, cough, gastropathy, hernia, hemorrhoids, helminthiasis, dyspepsia and skin diseases	0.151
Asteraceae	<i>Tagetes erecta</i> Linn.	Genda	Whole plant	Decoction and plant extract	Shows anthelmintic, aromatic, digestive, diuretic, sedative and stomachic properties; used internally to treat indigestion, colic, severe constipation, dysentery, cough and fever, and externally to treat sores, ulcers, eczema, sore eyes and rheumatism	0.076
Asteraceae	<i>Eclipta alba</i> (L.) Hassk.	Bhringraj	Whole plant	Extract and oil	diverse medicinal values and use it commonly for treatment of gastrointestinal disorders, respiratory tract disorders (including asthma), fever, hair loss and graying of hair, liver disorders	0.295
Asteraceae	<i>Artemisia vulgaris</i> L.	Damong maria	Leaf and flower	Decoction	Fever, sore throat, colds, cough and phlegm	0.551
Asteraceae	<i>Cyanthillium cinereum</i> (L.) H.Rob.	Kulantro	Leaf, root	Use for bathing; Smell heated roots	Measles	0.321
Asteraceae	<i>Chromolaena odorata</i> (L.) R.M.King & H.Rob.	Papaltok	Leaf, flower	Apply pounded leaves on wounds; Drink decoction	Wounds; Stomach ache, diarrhea, fever, vomiting	0.251
Asteraceae	<i>Blumea balsimifera</i> (L.) DC.	Sambong	Leaf, root, flower	Drink decoction ; use for bathing; fresh leaves applied as cold compass	Kidney stones, hypertension, cold, cough; Pregnancy Stomachache, fever	0.241
Asteraceae	<i>Pseudelephantopus spicatus</i> (B.Juss. ex Aubl.) Rohr ex C.F.Baker	Dila-dila	Leaf, root	Drink decoction, eat fresh leaves, apply heated leaves on affected body part	Skin infection; rabies and snake Snake bite, wounds	0.073
Asteraceae	<i>Ageratum conyzoides</i> (L.) L.	Baho-baho	Leaf, flower	Apply pounded leaves and flowers on	Wounds	0.035

Brassicaceae	<i>Lepidium sativum</i> L.	Curly grass, Peppergrasses	Leaves	wounds Leaf decoction	used in folk medicine for treatment of hyperactive airways disorders, such as asthma, bronchitis and cough	0.035
Bombacaceae	<i>Bombax malabaricum</i> DC. B. thorelii	Cotton tree, Silk cotton, Kapok	Leaves, flowers, bark	Leaf decoction, bark powder	Different plant parts are used as treatment for various conditions and diseases like cholera, fractures, toothache, coughs, urinary problems, influenza, and snake bites among others; flowers are astringent and refrigerant, and used to treat cutaneous troubles.	0.031
Burseraceae	<i>Commiphora mukul/C. wightii</i> (Arn.) Bhandari	Guggul	Sap	Gum resin	Gum resin is used for arthritis, lowering high cholesterol, "hardening of the arteries" (atherosclerosis), acne and other skin diseases, and weight loss.	0.021
Caricaceae	<i>Carica papaya</i> L.	Papeeta	Fruits, leaves	Whole fruits, ripe or unripe; leaf decoction	Used for treatment of a numerous diseases like warts, corns, sinuses, eczema, cutaneous tubercles, glandular tumors, blood pressure, dyspepsia, constipation, amenorrhoea, general debility, expel worms and stimulate reproductive organs.	0.112
Cucurbitaceae	<i>Citrulus colocynthis</i> (L.) Schrad	Colocynth, bitter apple, bitter cucumber	Leaves, fruits	Leaf decoction, fruit juice	Considered as cathartic, ecboic, emmenagogue, febrifuge, hydragogue, purgative, and vermifugal; the colocynth is used for amenorrhea, ascites, bilious disorders, cancer, fever, jaundice, leukemia, rheumatism, snakebite, tumors (especially of the abdomen), and urogenital disorders	0.035
Caesalpiniaceae	<i>Cassia angustifolia</i> Vahl.	Senna	Leaves, flowers, bark	Leaf decoction, bark powder	Used to treat constipation and also to clear the bowel before diagnostic tests such as colonoscopy. Senna is also used for irritable bowel syndrome (IBS), anal or rectal surgery, tears in the lining of the anus (anal fissures), hemorrhoids, and weight loss.	0.021
Caesalpiniaceae	<i>Cassia fistula</i> Linn.	Amaltas; Golden shower, Indian laburnum	Leaves, flowers, fruits, bark	Leaf decoction, fruit pulp, bark powder	Astringent, cooling, purgative, febrifuge, tonic, laxative, anthelmintic, emetic, antiperiodic, febrifuge, diuretic, depurative, carminative, anti-inflammatory, diuretic and ophthalmic	0.023
Caesalpiniaceae	<i>Cassia occidentalis</i> Linn.	Septicweed, coffee senna	Leaves, flowers	Leaf decoction	Used as a traditional medicine for the treatment of various diseases. This plant extracts are known to have antibacterial, antifungal, antimalarial, anti-inflammatory, antioxidant, hepatoprotective and Immunosuppression activity	0.121
Caesalpiniaceae	<i>Cassia tora</i> Linn.	Tora	Root, leaves, seeds, flowers	Leaf decoction, powdered seeds	Exhibit external germicide and antiparasitic character; used for treating skin diseases such as leprosy, ringworm, itching and psoriasis and also for snakebites; used as balm for arthritis	0.012
Caesalpiniaceae	<i>Saraca indica</i> (Linn.) Beddome	Ashoka	Leaves, Bark	Leaf and bark extract	Used as a uterine tonic and has been indicated in menstrual irregularities ESP in DUB; as a uterine stimulant and increases uterine contractions, also stimulates the ovarian tissue	0.521
Calophyllaceae	<i>Mesua ferrea</i> Linn.	Nagkesar	Leaves, flowers	Decoction powder	Used for the treatment of excessive thirst; for skin infections such as itching, eczema and scabies; flowers are also helpful for asthma, cough, cold and fever.	0.527
Colchicaceae	<i>Colchicum</i>	Yellow	Leaves,	Leaf extract;	Used as a carminative, laxative, and	0.314

ae	<i>luteum</i> Linn.	colchicum; Hirantulya	flowers, roots	paste of corm	an aphrodisiac; colchicines are effective in the treatment of gout, rheumatism, and diseases of liver and spleen; externally, the corms are applied as paste to lessen inflammation and pain.	
Cyperaceae	<i>Cyperus scariosus</i> R. Br.	Nagarmotha	Leaves	Leaf decoction	Used in the treatment of fevers, digestive system disorders, dysmenorrhea and other maladies. Modern alternative medicine recommends using the plant to treat nausea, fever and inflammation; for pain reduction; for muscle relaxation and for many other disorders.	0.012
Cornaceae	<i>Alangium salvifolium</i> (L.F) Wangerin	Ankol or Ankola, sage-leaved alangium	Roots, fruits	Extracts of roots and fruits	Used as astringent, laxative, refrigerant. it is used for the treatment of rheumatism, leprosy, gastric ulcers, Wound healing, epilepsy, scabies, gonorrhea, jaundice, hepatitis, diabetes, syphilis and asthma	0.013
Costaceae	<i>Cheilocostus speciosus</i> (J. Koningh) C. specth	Crepe ginger	Rhizome	Extract of rhizome	Rhizome has been used to treat fever, rash, asthma, bronchitis, and intestinal worms; mentioned in the Kama Sutra as an ingredient in a cosmetic to be used on the eyelashes to increase sexual attractiveness	0.016
Combretaceae	<i>Terminalia arjuna</i> (Roxb. ex DC) Wt and Arn	Arjuna	Fruits	Fruit powder	Used to balance the three "humors": kapha, pitta, and vata. It has also been used for asthma, bile duct disorders, scorpion stings, and poisonings	0.431
Combretaceae	<i>Terminalia bellirica</i> (Gaerth.) Roxb.	Bahera	Fruits	Fruit powder	Used to protect the liver and to treat respiratory conditions, including respiratory tract infections, cough, and sore throat	0.452
Combretaceae	<i>Terminalia chebula</i> Retz.	Black-or chebulic myrobalan	Fruits	Fruit powder	Used for high cholesterol and digestive disorders, including both diarrhea and constipation, and indigestion	0.456
Combretaceae	<i>Tinospora cordifolia</i> (Willd) Miers ex Hook. F. & Thoms	Giloy, gurcha	Leaves and stem	Extracts of leaves and stem	Used for diabetes, high cholesterol, allergic rhinitis (hay fever), upset stomach, gout, lymphoma and other cancers, rheumatoid arthritis (RA), hepatitis, peptic ulcer disease (PUD), fever, gonorrhea, syphilis, and to boost the immune system	0.235
Celastraceae	<i>Celastrus paniculatus</i> Willd.	Malkagni, black oil plant	Fruits and Seeds	Fruit extract, seed oil	Seeds are used to alleviate cognitive issues and promote intestinal health. The seeds can also be made into oil, which is sometimes used during massage. The oil is used to alleviate skin inflammation and has a mild sedative effect	0.113
Convolvulaceae	<i>Operculina turpethum</i> Linn. Silva Manso	Shweta (white); Tribhandi	Leaves, stem, roots	Churn prepared from root, stem and leaves	Root bark and seed are used in the for the treatment of skin disorders such as vitiligo and several diseases such as cervical lymphadenitis, fistulas, constipation, chronic gout, fever, bronchitis, ulcers, hemorrhoids, tumors, obesity, jaundice, herpes, and induced lacrimation; root powder for the treatment of rheumatism, flatulence, paralysis, scorpion sting, and snake bite, hematemesi, herpes, and tuberculosis, and for the treatment of corneal opacity and conjunctivitis, fresh juice of leaves is employed; <i>Avipattikar Churna</i> is used predominantly in disorders pertaining of stomach and intestines.	0.115
Euphorbiaceae	<i>Jatropha curcas</i> L.	Jayatri; Tuba-tuba	Root	Root decoction	Root decoction of <i>Jatropha curcas</i> is used for the treatment of eczema, scabies, ringworm, gonorrhea,	0.021

					dysentery, diarrhea, and the oil extract from the roots is used as an anthelmintic agent.	
	<i>Homalanthus populneus</i> (Geiseler) Pax	Balante	Root	Root decoction and powder	Spasm	0.034
	<i>Euphorbia tithymaloides</i> L.	Susong dalaga	Root	Root decoction	Enhances lactation	0.034
E	<i>Euphorbia hirta</i> Linn.	Asthma weed, Dudhi	Whole plant	Decoction	Used in the treatment of cancer, diarrhea, dysentery, intestinal, asthma, bronchitis, fever, eyelid styes, cough, asthma, bronchial infections, bowel complaints, helminthic infestations, wounds, kidney stones and abscesses etc. Decoction of dry herbs is used for skin diseases	0.124
	<i>Euphorbia thymifolia</i> Linn.	Chicken weed	Whole plant	Decoction and infusion	Used as decoction or infusion against dysentery, enteritis, diarrhoea and venereal diseases. The dried leaves and seeds are slightly aromatic and are used as a stimulant, astringent, anthelmintic and laxative	0.121
	<i>Mallotus philippensis</i> (Lam) Muell. Arg	Kamla	Leaves, fruits	Decoction and extract	Leaves are bitter, cooling and appetizer. Fruit is heating, Purgative, anthelmintic, vulnerary, detergent, maturant, carminative, alexiteric and useful in treatment of bronchitis, abdominal diseases, spleen enlargement	0.114
Fabaceae	<i>Bouhinia retusa</i> L.	Kachnar	Leaves, stem, flowers	Decoction and powder	Used for the treatment of bleeding hemorrhoids, cough, diarrhea, dysentery, heartburn, hematuria, indigestion, malaria, menorrhagia, skin diseases, sore throat, TB, dyspepsia, bronchitis, leprosy, ulcer, obesity and worms. It is also used as an astringent, tonic and anthelmintic	0.113
Fabaceae	<i>Bouhinia variegata</i> (L.) Benth	Kachnar	Leaves, stem, flowers	Decoction and powder	Used for the treatment of bleeding hemorrhoids, cough, diarrhea, dysentery, heartburn, hematuria, indigestion, malaria, menorrhagia, skin diseases, sore throat, TB, dyspepsia, bronchitis, leprosy, ulcer, obesity and worms. It is also used as an astringent, tonic and anthelmintic.	0.113
	<i>Butea monosperma</i> (Lam.) Taub.	Palash	Leaves, flowers	Leaf decoction, flower juice	Widely used in ayurveda, unani and homeopathic medicine. Flowers are astringent to bowel, in heal "Kapha", leprosy, strangury, gout, skin diseases, thirst sensation; flower juice is used to treat eye diseases.	0.112
	<i>Abrus precatorius</i> Linn	Precatory pea or bean	Leaves, roots, seeds	Leaf decoction, root extract	Used to treat tetanus, and to prevent rabies; leaves are used to cure fever, cough and cold. The roots are used to treat jaundice and haemoglobinuric bile.	0.111
	<i>Dolichos biflorus</i> Linn.	Sem	Seeds	Seed extract	Seeds are mainly used as tonic, astringent, diuretic, and are also recommended in asthma, bronchitis, urinary discharges, hiccoughs, heart trouble and other diseases of the brain	0.111
	<i>Dalbergia sissoo</i> Roxb.	Sissoo	Leaf, bark	Leaf juice, bark paste	Used in treatment of gonorrhoea and skin ailments; the leafy juice is used for eye ailments; the woody bark paste is used as anthelmintic, antipyretic and analgesic; wood is used for boils, leprosy and nausea.	0.012
	<i>Glycyrrhiza glabra</i> Linn.	Licorice	Leaves, root	Leaf decoction,	Used in treating coughs and colds, chronic fatigue, gastric and duodenal	0.116



				root extract	ulcers, and canker sores, abdominal pain, inflammation, muscle spasms, bronchitis, and as a heart tonic	
	<i>Macuna pruriens (L.) DC</i>	Velvet bean, Bengal velvet bean	Leaves, Seeds	Leaf decoction, seeds	Seed are used for the management of male infertility, nervous disorders, and also as an aphrodisiac	0.021
	<i>Pongamia glabra Vent.</i>	Indian beech Pongam oil tree	Leaves, root	Leaf and root paste	Applied as crude drug for the treatment of tumors, piles, skin diseases, and ulcers; root is effective for treating gonorrhoea, cleaning gums, teeth, and ulcers, and is used in vaginal and skin diseases	0.031
	<i>Pterocarpus marsupium Roxb.</i>	Vijaysar	Leaves, heart wood, flowers, bark	Extract of heart wood, bark, flowers and leaves	The heart wood, leaves, flowers and bark have useful medicinal properties. The heart wood is astringent, bitter, acrid, antiinflammatory, anthelmintic and anodyne. It is used for the treatment of elephantiasis, leucoderma, diarrhoea, dysentery, rectalgia, cough and greyness of hair.	0.041
	<i>Sesbania grandiflora Pers.</i>	Vegetable hummingbird; Agati	Leaves, flowers, roots, seeds	Leaf decoction, extract	Used as aperients, diuretic, emetic, emmenagogue, febrifuge, laxative, tonic properties which helps to cure many ailments externally as well as internally; because of its laxative properties it checks for anemia, tumor and also helps to improve memory	0.031
	<i>Tephrosia purpurea (L.) Pers</i>	Sarphonk, Sharpunkha	Leaves, flowers, seeds	Leaf decoction	Plant shows anthelmintic, alexiteric, restorative, and antipyretic properties; used in the treatment of leprosy, ulcers, asthma, and tumors, as well as diseases of the liver, spleen, heart, and blood.	0.051
	<i>Pithecellobium dulce (Roxb.) Benth.</i>	Kamatsile	Stem, fruit peel	Gargle decoction	Toothache	0.221
	<i>Pterocarpus indicus Willd.</i>	Narra	Stem	Leaf decoction	Tuberculosis	0.031
	<i>Senna alata (L.) Roxb.</i>	Akapulko	Leaf	Leaf juice on affected parts	Ringworm and other fungal infections	0.036
	<i>Psoralea carylifolia Linn.</i>	Kushtanashini	Leaves, flowers	Extract and paste	Used in the treatment of psoriasis, leucoderma; as a cardiac tonic, vasodilator and pigmentor.	0.112
Gentianaceae	<i>Hoppea dichotoma B. Hayne ex Willd</i>	Ram Jeeta	Leaf, root	Leaf decoction, root extract	Haemorrhoids piles, antidotes for venomous stings, bites; root used in treatment of paralysis, epilepsy, convulsions, spasm	0.012
Hypoxidaceae	<i>Curculigo orchoides Gaerth</i>	Golden eye-grass, Kali musli	Root, rhizome	Root and rhizome extract	The rhizomes of the plants are used for the treatment of decline in strength, jaundice and asthma; root is useful in treatment of heating, aphrodisiac, alternative, appetizer, fattening and piles, biliousness, fatigue, blood related disorders etc.	0.112
Hydrophyllaceae	<i>Hydrolea zeylanica (Linn.) Vahl</i>	Water olive, blue water leaf	Leaf	Pulp made from leaves	The pulp of leaves is used as a poultice, and has a cleansing and healing effect on neglected and callous ulcers; also possess antiseptic property.	0.013
Liliaceae	<i>Aloe vera (Linn.) Webb &amp; Benth</i>	Ghritkumari	Fleshy and succulent leaves	Gell	Antioxidant and antibacterial properties, accelerates the healing of burns, reduces dental plaque, helps treat canker sores, reduces constipation, prevent skin wrinkles, and lowers blood sugar levels.	0.526

	<i>Asparagus racemosus Willd</i>	Satawar	Leaves	Decoction	Used for upset stomach (dyspepsia), constipation, stomach spasms, and stomach ulcers. It is also used for fluid retention, pain, anxiety, cancer, diarrhea, bronchitis, tuberculosis, dementia, and diabetes	0.112
Lamiaceae	<i>Clerodendrum serratum (Linn.) Moon</i>	Ban-Bakri, Bharangi	Leaves, Root	Leaf juice, root extract	Root is useful in asthma, cough and scrofulous affections. It is given in fever and is useful in sinusitis. Juice of leaves is used with ghee as an application to herpetic eruptions and pemphigus. Leaves are vermifuge and bitter tonic	0.026
	<i>Mentha viridis Linne</i>	Spearmint, peppermint	Leaves	Leaf juice	Used in the treatment of fevers, headaches, digestive disorders and various minor ailments; the herb is antiemetic, antispasmodic, carminative, diuretic, restorative, stimulant and stomachic	0.421
	<i>Coleus barbetus (Andrews) Benth</i>	Patharchoor	Leaves	Leaf decoction and Paste	It is used to treat allergies, dry eye, skin conditions such as eczema and psoriasis, obesity, painful menstrual periods, irritable bowel syndrome (IBS), urinary tract infections (UTI), bladder infections, advanced cancer, blood clots, sexual problems in men, trouble sleeping (insomnia) etc.	0.521
	<i>Gloriosa superba Linn</i>	Lily	Leaves tubers	Juice	Plant juice used as an antimalarial agent; used traditionally for the treatment of bruises, colic, chronic ulcers, haemorrhoids and cancer, and is also employed as a tonic and purgative	0.121
	<i>Ocimum sanctum Linn.</i>	Tulsi	Leaves, stem, flowers, seed, roots	Leaf decoction and extract of various parts	Recommended for the treatment of bronchitis, malaria, diarrhea, dysentery, skin disease, arthritis, eye diseases, insect bites and so on	0.325
Linaceae	<i>Linum usitatissimum Linn.</i>	Flax, Tisi, Alsi	Seeds		Used for constipation, controlling levels of cholesterol and blood sugar in the body.	0.012
Lythraceae	<i>Lawsonia inermis Linn</i>	Henna	Leaves, seeds, bark	Leaf decoction, seed extract, bark powder	Shows analgesic, hypoglycemic, hepatoprotective, immunostimulant, anti-inflammatory, antibacterial, antimicrobial, antifungal, antiviral, antiparasitic, antitrypanosomal, antidermatophytic, antioxidant, antifertility, tuberculostatic and anticancer properties	0.013
Malvaceae	<i>Abelmoschus moschotus Medik</i>	Musk okra	Leaf, seeds	Leaf juice, emulsion of seeds	Used as an antidote for snakebites; emulsion from the seeds is considered to be anti-spasmodic and is used externally; extensively used as an insecticide and a aphrodisiac.	0.014
	<i>Bombax ceiba L.</i>	Red silk cotton	Leaves, roots	Leaf juice, root extract	Used to treat cutaneous troubles; young roots exhibit diuretic property and also as and tonic; used in the treatment of cholera, tubercular fistula, coughs, urinary complaints, nocturnal pollution, abdominal pain due to dysentery, and impotency	0.034
	<i>Helicteres isara L.</i>	Avartani, Marorphali	Leaf, seed	Extract of leaf and seed	Used as a folk medicine to treat snake bite, diarrhoea and constipation of new born baby.	0.021
	<i>Hibiscus rosa-sinensis Linn.</i>	Chinese Hibiscus, Shoebblack, Gurhal	Leaves, flowers	Decoction of leaves and flowers	The flowers are aphrodisiac, demulcent, emmenagogue, emollient and refrigerant; used internally in the treatment of excessive and painful menstruation, cystitis, venereal diseases, feverish illnesses, bronchial catarrh, coughs and to promote hair	0.012

					growth	
Magnoliaceae	<i>Michelia champaca</i> Linn.	Champa	Flowers, stem bark	Flower extract and bark powder	Flowers and stem bark are useful in diabetes, quick wound healing, cardiac disorders, gout, dysuria	0.021
Moringaceae	<i>Moringa oleifera</i> Lamk.	Munga, Sohjan	Leaves, roots, seeds, bark, fruit and flower	Decoction and extract of various parts	Leaves, roots, seed, bark, fruit, flowers and immature pods act as cardiac and circulatory stimulants, possess antitumor, antipyretic, antiepileptic, antiinflammatory, antiulcer, antispasmodic, diuretic, antihypertensive, cholesterol lowering, antioxidant, antidiabetic	0.031
Musaceae	<i>Musa paradisiaca</i> Linn.	Kela	Flowers and fruit	Flower extract and fruit pulp	The flower of this plant is used to treat ulcers, dysentery, and bronchitis and cooked flowers are good food for diabetics. The astringent ashes of the unripe banana peel and leaves are used in the treatment of dysentery and diarrhea and also for the treatment of malignant ulcers.	0.024
Mimosaceae	<i>Prosopis spicigera</i> Linn	Jandi, Ghaf	Bark, leaves	Gum, leaf smok	Plant produces gum showing cooling and anthelmintic property; used as tonic, cures leprosy, dysentery, bronchitis, asthma, leukoderma, hemorrhoids and muscle tremors; smoke of the leaves is good for eye troubles	0.026
	<i>Acacia catechu</i> (L.) Willd, Olive	Kher, Katha	Leaves, stem bark	Leaf decoction, bark extract	Used for diarrhea, swelling of the nose and throat, dysentery, swelling of the colon (colitis), bleeding, indigestion, osteoarthritis, and cancer. People apply catechu directly to the skin for skin diseases, hemorrhoids, and traumatic injuries; to stop bleeding; and for dressing wounds	0.025
	<i>Acacia nolotica</i> (Linn.) Del (Benth) brenan	Babul or Kikar	Leaves, stem fruits, seeds	Leaf decoction, fruit decoction	The plant acts as a powerful astringent. A decoction of the fruit is considered a febrifuge, and the seeds have antimalarial, antidiabetic, antihypertensive and antispasmodic activities	0.016
	<i>Albizia labbek</i> (Linn.) Benth	Lebbek, Shirish	Leaves, bark	Decoction, bark extract	<b>Lebbeck</b> is an astringent, also used by some cultures to treat boils, cough, to treat the eye, flu, gingivitis, lung problems, pectoral problems, is used as a tonic, and is used to treat abdominal tumors. The bark is used medicinally to treat inflammation	0.026
	<i>Mimosa pudica</i> L.	Lajvanti	Whole plant	Decoction and extract	possesses antibacterial, antivenom, antifertility, anticonvulsant, antidepressant, aphrodisiac, and various other pharmacological activities; used in the treatment of urinogenital disorders, piles, dysentery, sinus, and also applied on wounds	0.013
Myrtaceae	<i>Psidium guajava</i> Linn.	Amrood	Leaf extract and Fruit	Decoction and fruit pulp	effective in diarrhea, dysentery, gastroenteritis, hypertension, diabetes, caries, pain relief, cough, oral ulcers and to improve locomotors coordination and liver damage inflammation	0.511
	<i>Syzgium cumini</i> (Linn.) Skeels	Skeel, Jamoon	Fruit and bark	Fruit pulp and bark powder	Infusion of fruit or mixture of powdered bark and fruit is given orally to treat diabetes. Juice obtained from the seeds is applied externally on sores and ulcers. Powdered seeds are mixed with sugar are given orally 2–3 times daily in the treatment of dysentery	0.213
Meliaceae	<i>Azadirachta</i>	Neem	Leaves,	Leaf	Neem tree is used in	0.312

	<i>indica A. Juss</i>		stem and seeds	decoction, paste	many medicinal treatment like skin diseases, healthy hair, improve liver function, detoxify the blood, Pest and disease control, fever reduction, dental treatments, cough, asthma, ulcers, piles, intestinal worms, urinary diseases etc	
Moraceae	<i>Ficus benghalensis L.</i>	Bayan, Bargad	Leaves, bark, fruit	Leaf decoction, fruit extract	Used as an astringent to bowels; useful in treatment of biliousness, ulcers, erysipelas, vomiting, vaginal complains, fever, inflammations, leprosy	0.024
	<i>Ficus glomerata Roxb</i>	Goolar, Fig	Leaves, fruits	Leaf decoction, fruit extract	Used for various diseases/disorders including diabetes, liver disorders, diarrhea, inflammatory conditions, hemorrhoids, respiratory, and urinary diseases.	0.025
Nymphaea ceae	<i>Nymphaea pubescens Willd</i>	Kamal	Root, flower	Extract and decoction	Rootstock is used to treat dyspepsia, diarrhoea, piles, urinary ailments, cystitis, nephritis, enteritis, fevers, insomnia, jaundice, urinary troubles and haemorrhoids. Flower acts as an aphrodisiac, blood purifier and is used to treat palpitation of the heart.	0.215
	<i>Nelumbo nucifera Gaerth</i>	Lotus, Kamal	Various plant parts	Extract of plant parts	buds, flowers, anthers, stamens, fruits, leaves, stalks, rhizomes and roots have been used as herbal medicines for treatment of many diseases including cancer, depression, diarrhea, heart problems, hypertension and insomnia	0.251
Nyctagina ceae	<i>Boerhaavia diffusa Linn.</i>	Punarnava	Whole plant	Extract	Used for anti-diabetic and diuretic, pain relief, anti-inflammation, and treating indigestion	0.026
Oleaceae	<i>Nyctanthus arbor-tristis Linn.</i>	Night Jasmin, Parijat	Leaves and seeds	Leaf decoction and extract	Used in various ailments like fever, enlargement of the spleen, malaria, blood dysentery, cough and gastritis. Juices of leaves is used as digestives, antidote to reptiles venome. Seeds are used to cure scurfy infection of scalp, piles and skin diseases.	0.035
Pandanaceae	<i>Pandanus odoratissimus Roxb.</i>	Kewda	Leaves and roots	Leaf decoction and root extract	Used in living fences, coastal windbreaks, and it is planted for soil stabilization and as an ornamental; roots are used for the treatment of skin diseases, ulcers, dyspepsia, diabetes, fever and leprosy, and they are also considered antipyretic, expectorant and diuretic	0.061
Piperaceae	<i>Piper betel Linn.</i>	Pan	Leaves	Leaf decoction and extract	Betel leaves are mainly used as mouth freshener and is also well known for curing many communicable and non-communicable diseases like cold, cough, bronchial asthma, rheumatism, stomachalgia and used to treat other diseases like bad breath, boils and abscesses, conjunctivitis, constipation, swelling of gums, cuts	0.562
	<i>Cubela officinalis L. f.</i>	Lemon balm,	Leaves, roots	decoction	Used for the treatment of different kinds of disorders including seizure, ulcers, gout, rheumatism, inflammation, dizziness, tremor, paralysis, diarrhea, and hyperglycemia	0.031
Pedaliaceae	<i>Sesamum indicum Linn.</i>	Sesamum, Til	Leaves, Seeds	Leaf decoction, seed extract	Used as mild laxative, emollient and demulcent; the seeds and fresh leaves used as a poultice; antibacterial activity of seeds against <i>Staphylococcus</i> and <i>Streptococcus</i> as well as common skin fungi, such as athlete's foot fungus has also been	0.213

					well recognized	
Phyllanthaceae	<i>Phyllanthus niruri</i> Linn. Schum. & Thonn	gale of the wind, stonebreaker or seed-under-leaf.	Leaves	Leaf extract	Used as a folk medicine for treating kidney stones, gallbladder stones, liver related diseases such as liver cancer and jaundice, apart from these it is also administered for diuretic, hypoglycemic and hypertension cases and it also shows anti-inflammatory, anti-tumor, antinociceptive and antimicrobial	0.025
	<i>Phyllanthus fraternus</i> Linn. G.L.Webster	Bhumymlaki, Gripe weed	Leaves, fruits, roots	Decoction and extract	Used against jaundice and is considered acrid, carminative, cooling and useful in the treatment of thirst, bronchitis, asthma, leprosy, anaemia, venereal diseases, problems of the genito-urinary tract, anuria, biliousness and hiccups. The fruits are used in the treatment of ulcers, wounds, sores, scabies, ringworm and other skin problems. Fresh roots are taken against jaundice, and crushed with milk as a galactagogue. A decoction of roots and leaves is used to treat malaria. The plant sap is applied to treat bruises, sores and ulcers, and mixed with oil against ophthalmia and conjunctivitis. Powdered roots and leaves are made into a poultice with rice-water to treat oedema and ulcers.	0.021
	<i>Emblica officinalis</i> Gaertn.	Amla	Fruit	Extract and powder	Used as antioxidant, immune modulatory, antipyretic, analgesic, cytoprotective, anti ulcer, immune modulatory, anti inflammatory, antitussive and gastroprotective	0.253
Plumbaginaceae	<i>Plumbago zeylanica</i> Linn.	Chitrak	Leaves	Decoction	Used in treating intestinal troubles, dysentery, leucoderma, inflammation, piles, bronchitis, itching, diseases of the liver, and consumption; leaves used for treating laryngitis, rheumatism, diseases of the spleen, ring worm, scabies, and it acts as an aphrodisia	0.231
Poaceae	<i>Saccharum officinarum</i> Linn.	Ganna	Stem	Juice	Used as aphrodisiac, laxative, cooling, demulcent, antiseptic, and tonic; sugarcane juice is considered good for patients with jaundice	0.341
	<i>Bambusa arundinacea</i> Willd	Vamsa, Bans	Leaf, root, shoot	Decoction	Used for the treatment of cough, skin diseases, wounds, digestive disorders, nausea, gynecological disorders and fever; possess possess Anti-inflammatory, Anti-ulcer, Anti-diabetic, Anti-oxidant, anthelmintic, astringent, emmenagogue activity	0.013
Primulaceae	<i>Embelia ribes</i> Burm. F.	Vidanga	Fruit and root	Decoction and Powder	Used for fungal infections of skin, worms in stomach, heart diseases, facial paralysis, blood motions and for back ache during menses	0.024
Punicaceae	<i>Punica granatum</i> Linn.	Pomegranate, Ananas	Leaves, fruits	Decoction and fruit juice	Used in natural and holistic medicine to treat sore throats, coughs, urinary infections, digestive disorders, skin disorders, arthritis, and to expel tapeworms.	0.0121
Putrangiva ceae	<i>Putranjiva roxberghii</i> Wall.	Putranjivaka	Leaf, fruit	Decoction and leaves and fruits	Used for the for the treatment of eye disorders, burning sensation, elephantiasis, difficulty in micturition, azoospermia and habitual abortions	0.112
Rubiaceae	<i>Anthocephalus coddamba</i> (Roxb.) Mia	Kadamb	Leaf and fruit	Decoction and leaves and fruits	Used for various ailments such as fever, uterine complaints, skin diseases, inflammation, anemia,	0.111

					dysentery, leprosy, diabetes mellitus, fever, haemoptysis, cough, vomiting, wounds, ulcers, debility and antimicrobial activity.	
Rhamnaceae	<i>Zizyphus jujuba Lam</i>	jujube red date, Ber	Fruit	Decoction and pulp	Used for improving muscular strength and weight, for preventing liver and bladder diseases and stress ulcers, and as a sedative; also used to reduce constipation and to reduce symptoms of some medications	0.113
Sapotaceae	<i>Madhuca indica Gmelin</i>	Mahua	Leaves, fruit	Fruit pulp	Used as anti diabetic, antiulcer, hepato protective, anti pyretic, anti fertility, analgesic, anti oxidant, swelling, inflammation, piles, emetic, dermatological, laxative, tonic, anti burn, anti earth worm, wound healing headache	0.212
	<i>Mimusops elengi Linn.</i>	Bakula	Bark, flowers, fruits, seeds	Paste, powder and decoction	Bark, flowers, fruits, and seeds are used as astringent, cooling, anthelmintic, tonic, and febrifuge; mainly used for dental ailments such as bleeding gums, pyorrhoea, dental caries, and loose teeth	0.211
Santalaceae	<i>Santalum album Linn.</i>	Chandan, Sandalwood	Bark, leaves	Decoction, oil	Sandalwood oil has been widely used in folk medicine for treatment of common colds, bronchitis, skin disorders, heart ailments, general weakness, fever, infection of the urinary tract, inflammation of the mouth and pharynx, liver and gallbladder complaints and other maladies	0.215
Sapindaceae	<i>Sapindus mukoro ssi Guerth</i>	Washnut, Ritha	Fruits	Extract, powder	Used for removing lice from the scalp. joint pain and the roots are used in the treatment of gout and rheumatism	0.031
	<i>Schleichera oleasa (Lour.) Oken</i>	Kusum	Leaves, flowers	Decoction, extract	Used as antimicrobial, antioxidant, anticancer activity	0.020
Solanaceae	<i>Solanum surattiens L. Burm.f</i>	Kateli	Root, stem, flowers, and seeds	Decoction	Used in bronchitis, cough, constipation and in dropsy, decoction used in gonorrhoea and promotes conception. Fruits, flowers and stem: prescribed in vesicular and watery eruption, juice of the berries beneficial in sorethroat, fine powder mixed with honey cures children chronic cough	0.116
	<i>Solanum nigrum Linn.</i>	black nightshade	Leaves, fruits	Decoction and Paste	Used as a veterinary medicine. It is used against itching, skin diseases and eczema. It reduces gas formation in the stomach. In America, Africa and other parts of the world, it is used as a food crop though complained of toxicit	0.114
	<i>Datura metel Linn</i>	devil's trumpet, Datura	Leaves, fruit	Decoction, extract	Used additionally to treat hydrophobia, epilepsy, convulsion, syphilis, inflammation of the breasts, smallpox, mumps and leprosy	0.115
	<i>Withania somnifera (L.) Dunal</i>	Ashwagandha, Indian ginseng	Leaves, flowers, fruits	Decoction and paste	Used as an aphrodisiac, liver tonic, anti-inflammatory agent, and more recently to treat asthma, ulcers, insomnia, and senile dementia; also used to treat anxiety, cognitive and neurological disorders, inflammation, and Parkinson's disease	0.421
	<i>Hyoscyamus niger L.</i>	Henbane	Leaves, flowers	Decoction	Used in traditional herbal medicine for ailments of the bones, rheumatism, toothache, asthma, cough, nervous diseases, and stomach pain; also used as analgesic, sedative,	0.124

					and narcotic in some cultures.	
Simarouba ceae	<i>Allanthus excelsa Roxb.</i>	Cora, Tree of haven	Leaves, bark	decoction	Bark used in India as a powerful fever-cure and tonic. Leaves and bark in good repute as a tonic after labor, and the juice of the leaves and fresh bark employed by the Konkans as a remedy for after-pains.	0.026
Vitaceae	<i>Cissus quadrangularis Linn.</i>	Veldt grape, devil's backbone, adam ant creeper, asthisa mharaka, hadjod and pirandai	Leaves, fruits	Decoction, extract	Used to treat hemorrhoids, bone loss, allergies, asthma, and diabetes.	0.216
Zygophyll aceae	<i>Tribulus terrestris Linn.</i>	Abrojo	Leaves	Decoction, paste	Used to enhance libido, to keep the urinary tract healthy and to reduce swelling; also used to increase testosterone levels	0.312
Zingiberac eae	<i>Curcuma angustifolia</i>	Tikhur	Rhizome	Extract and decoction	Used to soothe coughs and bronchitis; Essential oils are used in antifungal medications; also exhibit antibacterial activity	0.020
	<i>Curcuma longa Linn.</i>	Turmeric	Rhizome	Extract and powder	Used as a spice in Indian food; exhibit a wide range of biological activities e.g. anticancer, antimicrobial, antiinflammatory and free radical scavenging activity	0.324
	<i>Curcuma caesis Roxb.</i>	Kalihaldi	Rhizome	Extract and powder	Used in treatment of leprosy, cancer, wounds, impotency, fertility, tooth ache, vomiting, allergies, leucoderma, asthma, tumours, piles, bronchitis, enlargement of the spleen, epileptic, menstrual disorder, smooth muscle relaxant activity, anthelmintic, aphrodisia	0.056

A total of 134 species of medicinal plants belonging to 115 families of flowering plants have been documented to be used by rural, tribal and non-tribal communities from twelve blocks of Chatra district (Jharkhand). The most representative family was Fabaceae with 16 species, followed by Asteraceae (10 species), Euphorbiaceae (6 species), Caesalpiniaceae, Lemiaceae, Mimosaceae and Solanaceae (5 species each). Acanthaceae, Combretaceae and Malvaceae were represented by only four species of medicinal plants. Other plants included least number of medicinal plants.

The use value of the present medicinal plants was also computed to quantify the importance of specific plant species. It was found that the 88 plant species had lowest use value < 0.200. The use value of *Mesua ferra*, *Saraca indica*, *Aloe vera*, *Coleus barbetus*, *Psidium guajava* and *Piper betel* was 0.527, 0.521, 0.521, 0.511 and 0.561 respectively and, therefore, considered to be the most important medicinal plant species of district Chatra. Other medicinal plant species showed moderate use value (0.213-0.412) (Table-2).

#### IV. Discussion

The main ailments in the study area were fever, antimicrobials, inflammation, toothache, ophthalmic problems, rheumatism, cancers, snake bites, asthma, cough and cold, skin disorders, dysentery, diabetes, wound healing, jaundice and stomach problems (Table-2). Different types of preparations were used from plant species by tribal and non-tribal communities that included juice, paste, decoction, powder and whole plant extract.

All medicinal plant species surveyed were used by people in more than one form of combinations. Majority of plant species were used medicinally in the form of decoction obtained from the leaves, roots, seeds, flowers and bark. The present observations are more or less similar with the previous reports which have been indicated earlier in relation to medicinal plants uses by the Indian traditional system of medicine like Siddha and Ayurveda (Kirtikar and Basu, 2001) [21]. The present reports also gain support from the observation of Nandagoapalan *et al.*, (2015; Ragragio *et al.*, 2013; Tantengco *et al.*, 2018) [22, 23, 24] who have observed similar results on medicinal plants. However, the therapeutic importance of these plant species has less information on their active phytochemical and therefore, the active principles responsible for pharmacological action requires further investigation at scientific level to validate the claim.

## V. Conclusions

From the present observation it can be concluded that the knowledge and usage of conventional medicine for the treatment of various diseases among the rural, tribal and non-tribal communities is still a major part of their life and culture. People of Chatra have a strong faith in the efficacy and success of traditional medicine and the results of the present study provide evidence that the medicinal plants continued to play a vital role in the healthcare system of tribal and non-tribal community of Chatra.

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