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Ethno-medicinal Plants used to Cure Different Diseases by Rural Folks and Tribes of North Eastern Tarai Districts of Uttar Pradesh, India

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ABSTRACT

The present study was undertaken to collect information from local folks, tribes and traditional healers on medicinal plants and their uses and the types of diseases treated in tarai regions mainly districts viz., Bahraich and Shrawasti of Uttar Pradesh during August 2007 to March 2010. The indigenous knowledge was gathered through interactions and questioners with tribal rural and traditional healers. The study provides information on 68 plant species belonging to 41 families, Apocynaceae and moraceae contributed maximum species. The various ethno medicinal plants parts used against the diseases like bronchitis, cardiovascular diseases, diabetes, gastro intestinal disorder, gynaecological disorder, jaundice, neurological diseases, ophthalmic infection, piles, skeletal diseases, skin diseases and snakebite were bark, flowers, rhizomes, roots, leaves, seeds, gum and sometimes whole plants. In spite of the modernization process, the rural folk and the tribal of the districts still hold on their traditional faith and depend on indigenous plants for their various needs, especially medicines. Since, there is insensitivity among the youngsters for this wealth of knowledge, this will be dwindling soon.

Key words: Traditional knowledge, medicinal plant, Bahraich, Shrawasti, diseases

INTRODUCTION

Allopathic drugs have brought a revolution throughout the world but the plant based medicines have its own unique status. Nearly 80% of the world population depends upon traditional system of health care (WHO, 1993; Ishtiaq *et al.*, 2006b; Hamayun *et al.*, 2006; Kumar and Chandrashekar, 2011). It is well known that this system offers minimal side effects and relatively low cost as compared to other systems of medicine. This is the reason that patients in developing countries such as Bangladesh (90%), Myanmar (85%), India (80%), Nepal (75%), Srilanka (65%) and Indonesia (60%) have strong conviction in this system (Malik *et al.*, 2011). It is estimated that more than half of the drug under clinical use at present owe their origin to plants. India is called as botanical garden of the world (Joseph and Jini, 2011) and represented by over 17000 species of flowering plants distributed in 9 phyto-geographical regions of which more than 43% are reported to be of medicinal importance (Pushpangadan, 1995; Pattanaik *et al.*, 2006). India is one of the leading countries in Asia in terms of the wealth of traditional knowledge systems related to herbal

medicine and employs a large number of plant species includes Ayurveda (2000 species), Siddha (1121 species), Unani (751 species) and Tibetan (337 species) (Kumar *et al.*, 2011). In spite of the modernization process, the rural folk and the tribal of the state still hold on their traditional faith and depend on indigenous plants for their various needs, especially medicines. Plants accumulate a diverse array of natural products which are thought to be involved in their interactions with the environment. These chemicals function in interactions with microbes, animals and even other plants, as well as protecting the plant from ultraviolet radiation and oxidants. Some compounds may attract beneficial insects or microbes, whereas others kill or repel predators. The medicinal value of plants has assumed a more important dimension in the past few decades owing largely to the discovery that extracts from plants contain not only minerals and primary metabolites but also a diverse array of secondary metabolites with antioxidant potential (Akinmoladun *et al.*, 2007; Ashawat *et al.*, 2007; Chanda *et al.*, 2011). These secondary metabolites, however, are likely to be essential for the successful competition or reproduction of a given plant species in its natural environment. Secondary compounds are often involved in key interactions between plants and their abiotic and biotic environments that influence those (Facchini *et al.*, 2000). Throughout history secondary metabolites of plants have been utilized by humanity. There are approximately 4 major classes of secondary compounds that are significant to humans. The classes are the alkaloids, phenylpropanoids, flavonoids and the terpenoids (Edwards and Gatehouse, 1999). These secondary metabolites are used in preparation of medicines. Plant which are used for extraction of these secondary metabolites, are known as medicinal plants.

Human communities have developed knowledge and practices by trial and errors experimentations (Siddique *et al.*, 2004) and by intuitive methods etc., leading to unique creation known as Traditional Knowledge (TK). The indigenous traditional knowledge of medicinal plants of various ethnic communities, where it has been transmitted orally for centuries is fast disappearing from the face of the earth due to the advent of modern technology and transformation of traditional culture. Indian traditional medicine is based on different systems such as Ayurveda, Siddha and Unani used by various communities (Gadgil, 1996). In recent times, many important medicinal plants are being depleted very swiftly due to unscientific exploitation, natural calamities road construction, uprooting, cutting and overgrazing ignorantly or determinately which may lead towards complete extinction of some of these species (Ishtiaq *et al.*, 2006a; Kumar *et al.*, 2011; Prakash *et al.*, 2011) and the growing biopiracy and misappropriation of Traditional Knowledge, held by the various communities especially of the developing world, have raised concerns for a new system of legal protection of TK. Hence, there is an urgent need to document the ethno biological information presently existing among the diverse communities before the traditional knowledge is completely lost (Rao, 1996). In present scenario there is a vast area of research in phyto-medicine which increases the global tendency for reinforcement and documentation of traditional system of medicine. The present study is therefore, undertaken to interact with local folks, tribes and traditional healers to share their knowledge on medicinal plants and their uses and the types of diseases treated, to world through documentation.

MATERIALS AND METHODS

North eastern tarai regions mainly Bahraich and Shrawasti districts of Uttar Pradesh is located between 28° 15' N latitude and 81° 11' E longitude with a total area of 6702 sq. kms. towards the Northern region of the state Uttar Pradesh. The study involves intensive explorations and critical study of specimens for 3 years. Regular field trips were made in such a way so as to cover all the

areas of the district as regular intervals in different seasons from August 2007 to March 2010. First-hand information was gathered through interactions with tribal and rural people including members of forest protection committees. Also interactions were made by local traditional healers to tap the information of medicinal plants commonly used by these traditional healers by questionnaire. Medicinal properties of plants were learned through informal interviews. A number of group discussions were also conducted during the period of investigation. To ascertain the uses of these medicinal plants the earlier published scientific literature sources referred to are: Sharma *et al.* (1985), Jain (1991), Kirtikar and Basu (1991), Ambasta *et al.* (1992) and Chopra *et al.* (1996). In the following enumeration, plant names have been arranged alphabetically in disease wise. The correct botanical name is followed by family, local name, parts use with their medicinal uses. An effort was made to crosscheck the folklore claims. This study involves checking and rechecking of a particular folklore claim by the different dwellers of the same area in different pockets. This has cleared many doubts regarding the use and identity of plant specimens. The details have been provided in Table 1 with correct botanical identification followed by family, vernacular names, parts used and mode of administration in respect to different diseases.

RESULTS AND DISCUSSION

The study provides information on 68 plant species belonging to 41 families (Table 1). Apocynaceae and moraceae contributed maximum species (Fig. 1). Of the plants species described, 4 species are monocotyledons, 64 are dicotyledons, 19 species are herbs, 18 are shrubs, 26 are trees and 5 are climbers (Fig. 4). The most important medicinal species were: *Acacia nilotica*, *Aegle marmelos*, *Lawsonia inermis*, *Mangifera indica*, *Mimosa pudica*, *Saraca indica*, *Terminalia chebula*. The plant parts used for medical preparation were bark, flowers, rhizomes, roots, leaves, seeds, gum and whole plants. In some cases the whole plant including roots was utilized. The most frequently utilized plant parts (Fig. 3) were leaves (52) followed by root (24), whole plant (22), bark (20), fruit (17), seeds (11) and rhizome (5), flower (3), stem (2) and latex (2). The paper presents a brief account of the uses of various ethno medicinal plants parts against the diseases like bronchitis, cardiovascular diseases, diabetes, gastro intestinal disorder, gynaecological disorder, jaundice, neurological diseases, ophthalmic infection, piles, skeletal diseases, skin diseases and snakebite by the people of Bahraich and Shrawasti district and highlights the need for further investigation on biochemical and pharmaceutical aspects. The largest number of 19 plant species were used to treat skin diseases (blood purification, scabies, leprosy and itching), 18 plant species were used for gastrointestinal ailments (constipation, diarrhoea, dysentery, gastric and stomach-ache), each 15 plant species were used for jaundice and piles, 14 plant species were used for diabetes, 13 plant species were used for skeletal diseases (pain on limbs, gout, rheumatism and arthritis), 10 plants species each were used for respiratory tract infection (bronchitis and asthma) and gynaecological disorders (gonorrhoea, leucorrhoea and menstrual problems), 7 plant species each were treated for, neurological diseases, ophthalmological ailments and snakebite and 3 plant species were used for cardiovascular diseases (Fig. 2). Such is the enormous potential hidden in these plants gifted by Nature (Ahmad *et al.*, 2003; Sahu *et al.*, 2010). Most of the interviews were familiar with the species dealing with common ailments like cough, cold, fever and skin diseases. Although our ancient sages through hit and trial method developed herbal medicines, the reported uses of plant species do not certify efficacy (Tarafdar, 1986). The present preliminary report on ethno-medicinal uses of some plants species need to pharmacologically screened, chemically analysed and tested for bioactive activities (Chandler *et al.*, 1979; Fairbairn, 1980).

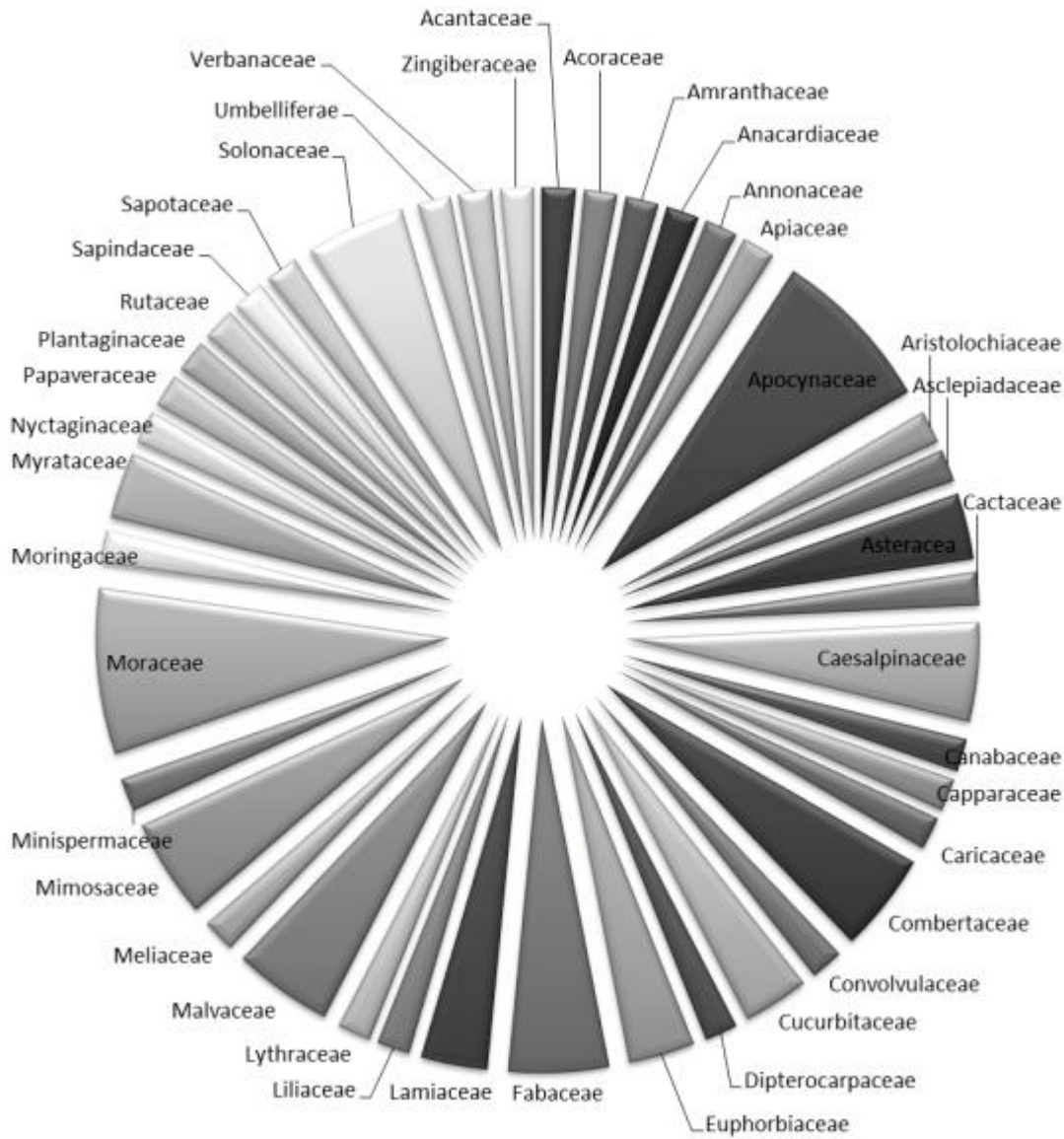


Fig. 1: Families of ethno-medicinally important plants

Pharmacological screening of plant extracts provides insight to both their therapeutic and toxic properties and helps in eliminating the medicinal plants or practices that may be harmful. Modern allopathic medicine, even as of to date, is dependent upon medicinal plants for discovery of newer and better drugs (Cotton, 1996; Rahmatullah *et al.*, 2010). Some information recorded in the study particularly for *Aristolochia indica* L., *Ficus racemosa* L., *Hygrophila auriculata* K. Schum and *Syzygium cerasoides* (Roxb.) Raizada were found to be either not known or little known, whereas *Asparagus racemosus* Willd, *Holarrhena pubescens* (Buch.-Ham.) Wall ex.G-Don. and *Rauwolfia serpentina* (L.) Kurz were found to be used very common by other tribes indicating the authenticity of their usefulness (Saxena *et al.*, 1988; Sarkar *et al.*, 1999). The study area is rich

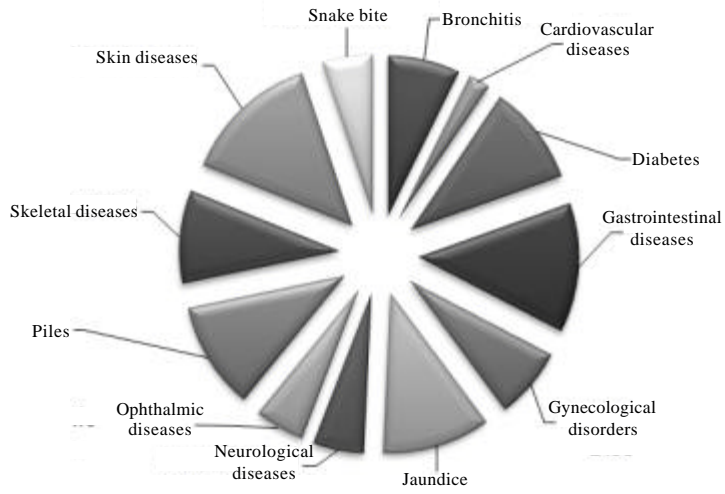


Fig. 2: Ethno-medicinally use of plants

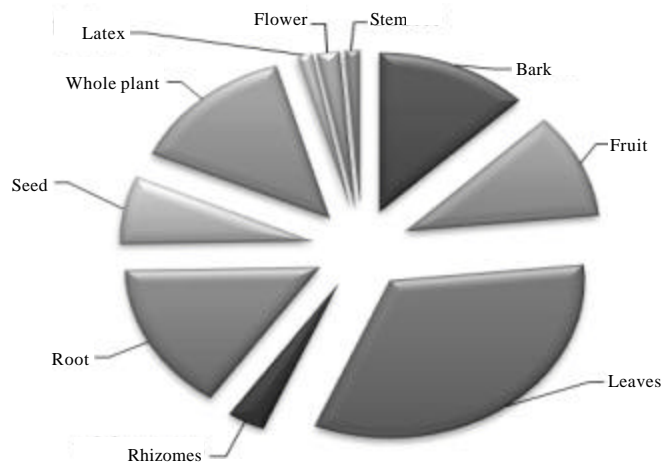


Fig. 3: Plants parts used for ethno-medicinal purpose

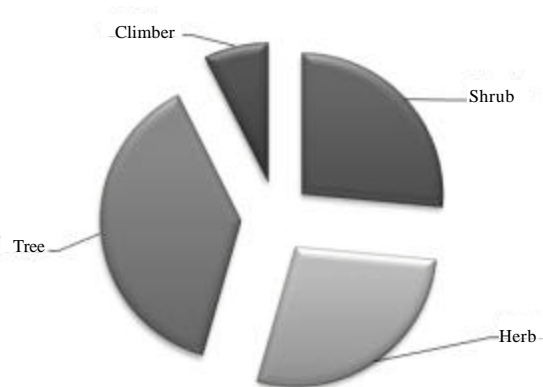


Fig. 4: Habit of ethno-medicinally important plants

Table 1: Important ethno-medicinal plants of district bahraich and shrawasti district

Disease				
Botanical name	Family	Local name	Part used	Mode of administration
Bronchitis diseases				
<i>Abutilon indicum</i> L.	Malvaceae	Kanghi atibala	Leaf	Leaf decoction is used to control the disease.
<i>Abrus precartorius</i> L.	Fabaceae	Kaincha	Seed	Seeds are made into powder and given in small doses to subside pain due to asthma
<i>Achyranthes aspera</i> L.	Amranthaceae	Latjira, chirchira	Whole plant	Plant juice are taken twice
<i>Acorus calamus</i> L.	Acoraceae	Bach	Root	Root is used internally in bronchitis and sinusitis
<i>Bacopa monneri</i>	Plantaginaceae	Jal brahmi	Whole plant	Dried plant powder is given internally in the treatment of Asthma
<i>Hygrophila auriculata</i> K. Schum	Acanthaceae	Koilekha	Leaf	Powdered leaves are taken twice a day for a week against bronchitis, cough and epidemic fever
<i>Madhuca longifolia</i> var <i>latifolia</i> (Roxb)	Sapotaceae	Mahua	Flower	Decoction of flowers boiled in water is given twice a day against cold, cough and headache
<i>Mimosa himalayana</i> Gamble	Mimosaceae	Khirkichi	Root.	Roots are made into powder mixed with honey in equal quantities and is given, one teaspoonful thrice a day for fifteen days against bronchial asthma
<i>Sida acuta</i> , Worm f.	Malvaceae	Bariari	Root	Root decoction is taken internally for breathing problems and cough
<i>Tinospora cordifolia</i> Willd.	Menispermaceae	Gurach	Whole plant	Plant Juice is taken against bronchial diseases
Cardiovascular diseases				
<i>Terminalia alata</i> Heyne ex Roth	Combretaceae	Asna	Bark	Bark is boiled in water this water is taken internally to relieve chest pain
<i>Terminalia arjuna</i> (Roxb)	Combretaceae	Arjuna	Fruit	Powder of fruit is given internally with warm water once daily before going to bed to cure cardiac problem
<i>Terminalia chebula</i> Retz.	Combretaceae	Harre, harida	Fruit	One teaspoonful of ground powder of fruit is given internally with warm water once daily before going to bed to cure chest pain
Diabetes				
<i>Acacia nilotica</i> ssp. <i>Indica</i> L.	Mimosaceae	Babul	Whole plant	Powder mix with <i>Pongamia pinnata</i> and Neem eaten twice a day
<i>Aegle marmelos</i> L.	Rutaceae	Bel, bilva	Leaves	Fresh leaves are given in the morning daily to control the blood sugar
<i>Annona squamosa</i> L.	Annonaceae	Santa, sitaphal	Leaves and barks	Powder of leaves and bark given daily to control sugar
<i>Callicarpa macrophylla</i> Vahl.	Verbanaceae	Daia, priyangu	Leaves, Flower	Decoction of leaves and flower taken once daily.
<i>Cassia fistula</i> L.	Caesalpiniaceae	Amaltas	Leaves	Dried leaves powder twice daily
<i>Catharanthus roseus</i> L. G. Don	Apocynaceae	Sadabahar	Leaf	Leaf extract mixed with bark and flower extract of <i>Madhuca longifolia</i> is given one cup twice daily

Table 1: Continued

Disease				
Botanical name	Family	Local name	Part used	Mode of administration
<i>Coccinia grandis</i> (L.) J. Voigt	Cucurbitaceae	Bankundri	Leaf, root	Juice of leaves and roots are taken twice
<i>Madhuca longifolia</i> var <i>latifolia</i> (Roxb.) Chev	Sapotaceae	Mahula	Bark and flower	Bark and Flower extract mixed with leaf extract of <i>Catharanthus roseus</i> is given one cup twice daily to the diabetic patients
<i>Mangifera indica</i> L.	Anacardiaceae	Aam	Leaves	One teaspoonful leaf powder taken in empty stomach for 21 days
<i>Momordica charantia</i> L.	Cucurbitaceae	Karella	Fruit, leaves	Extract of leaves is given in empty stomach and fruit in a meal daily for a month
<i>Moringa oleifera</i> Lam.	Moringaceae	Sahinjan, mungan,	Leaves	Young leaves taken daily before breakfast
<i>Saraca asoca</i> (Roxb.) De Wilde	Caesalpinaceae	Asoka	Leaves	One teaspoonful of leaf powder with water is taken daily
<i>Syzygium cerasoides</i> Roxb.	Myrtaceae	Madanua	Barks	One teaspoonful of sunlight dried bark powder is given daily with water
<i>Syzygium cumini</i> L.	Myrtaceae	Jamun	Fruit, seeds, Leaves	About ½ teaspoon seed/leaf powder mixed with honey or gur is taken twice daily for 20-30 days. Fruit juice is also good
Gastro intestinal diseases				
<i>Acacia nilotica</i> ssp. <i>Indica</i> L.	Mimosaceae	Babul	Leaves	Fresh leaves warm out and given orally in diarrhoea
<i>Aegle marmelos</i> L.	Rutaceae	Bel, Bilva	Fruit, seed, leaves	Ripe fruit pulp is given in the morning twice a day for 2-3 days to improve digestive disorder. Dried fruit and seed powder is used in the treatment of chronic dysentery, dyspepsia. Seven leaves with 5 <i>Piper nigrum</i> for seven days will be effective for worms and dysentery
<i>Ageratum conyzoides</i> L.	Asteraceae	Jangali pudina, visadodi	Leaves	Leaf juice is taken internally in dyspepsia
<i>Aristolochia indica</i> L.	Aristolochiaceae	Hooka-bel, ishar mul	Root	Decoction of root is given in constipation and abdominal colic
<i>Asparagus racemosus</i> Willd	Liliaceae	Satawari	Tuber	Fresh tuber is taken internally twice a day for one week
<i>Carica papaya</i> L.	Caricaceae	Papita	Fruit	Ripe fruit pulp is given I twice a day for 2-3 days to improve digestive disorder
<i>Cassia fistula</i> L.	Caesalpinaceae	Amaltas	Root	Root of plant is chew twice for 3 days against stomach-ache
<i>Cassia tora</i> L.	Caesalpinaceae	Chakvad, chakunda	Seeds	Seed powder and leaf juice is taken as remedy for flatulence and abdominal pain from intestinal worms
<i>Ficus racemosa</i> L.	Moraceae	Gular	Leaves, stem	Fresh juice (50-100 mL) of leaves is given with water for about 10 days to treat gastro intestinal problems
<i>Holarrhena antidysentrica</i> Roth	Apocynaceae	Dudhi, kurchi	Bark	Barks paste taken with little quantity of salt twice daily

Table 1: Continued

Disease				
Botanical name	Family	Local name	Part used	Mode of administration
<i>Litsea glutinosa</i> CB Robbin	Lauraceae	Maida, garibjuar	Bark	Bark powder boiled with water and water separated and taken every morning in stomach worms
<i>Madhuca indica</i> Gmelin	Sapotaceae	Mahua	Bark	Bark juice is used as drug for intestinal problems like ulcers
<i>Mimosa pudica</i> L.	Mimosaceae	Chhui-mui,	Root, leaves	Extract of root and leaves is used as drug for intestinal problems
<i>Morus alba</i> L. (<i>Morus indica</i> L)	Moraceae	Toot, tont, sahtoot	Fruit	Ripen fruits used in diarrhoea
<i>Mucuna pruriens</i> (L.) DC	Fabaceae	Kiwach, kaunch,	Seeds	Treating intestinal gas, diarrhoea
<i>Rauwolfia serpentina</i> L.	Apocynaceae	Jhabarbarua,	Leaves	Juice of tender leaves is given on empty stomach pain
<i>Shorea robusta</i> Gaertn. f.	Dipterocarpaceae	Sal	Seeds	Seeds are powdered and given internally for stomach pain
<i>Tinospora cordifolia</i> Willd.	Menispermaceae	Gurach	Whole plant	Plant juice is taken against stomach disorder
Gynaecological disorders				
<i>Abrus precatorius</i> L.	Fabaceae	Gumchi	Whole plant	Two spoonful decoction of whole plant is taken orally twice a day for a week to treat gonorrhoea
<i>Abutilon indicum</i> L.	Malvaceae	Kanghi, atibala	Root, bark	Root and bark powder with honey once in a day, For 6 months for safe pregnancy and gonorrhoea
<i>Acacia nilotica</i> ssp. <i>Indica</i> L.	Mimosaceae	Babul	Bark	Bark powder is taken in gonorrhoea and leucorrhoea
<i>Argemone mexicana</i> L.	Papaveraceae	Bhundo katila	Root	Root decoction is used to treat gonorrhoea
<i>Asparagus racemosus</i> Willd	Liliaceae	Satawari	Root/rhizome	Root paste is applied externally on abdomen for quick delivery. Rhizome juice is used internally for the treatment of leucorrhoea
<i>Linum usitatissimum</i> Linn	Liniaceae	Alsi	Bark leaves	Fresh leaves and bark are taken orally to treat gonorrhoea
<i>Mimosa pudica</i> L.	Mimosaceae	Chhui-mui	Leaves	Vaginopathy, tumour of the uterus
<i>Saraca asoca</i> (Roxb.) De Wilde	Caesalpiniaceae	Asoka	Root	Root bark decoction along with milk is taken internally in empty stomach twice for a month for irregular menstruation
<i>Sida acuta</i> , Worm f.	Malvaceae	Bariari	Plant	Plant decoction is taken internally for leucorrhoea
<i>Terminalia arjuna</i> (Roxb)	Combretaceae	Arjun	Bark	Bark is boiled with water and after boiling water is taken internally in empty stomach
Jaundice				
<i>Abutilon indicum</i> L.	Malvaceae	Kanghi, atibala	Root, bark	Root and bark pastes are taken orally to cure liver disorder
<i>Aegle marmelos</i> L.	Rutaceae	Bel, Bilva	Fruit	Fruit pulps are taken orally
<i>Argemone mexicana</i> L.	Papaveraceae	Bhundo katila	Whole plant	Plant juice is taken orally to cure jaundice to cure jaundice

Table 1: Continued

Disease				
Botanical name	Family	Local name	Part used	Mode of administration
<i>Asparagus racemosus</i> Willd	Liliaceae	Satawari	Tuber	The tuber made into paste and taken internally to cure jaundice
<i>Bacopa monneri</i>	Plantaginaceae	Jal brahmi,	Whole plant	Decoction of dried plant powder daily two to three times
<i>Boerhavia diffusa</i>	Nyctaginaceae	Gadpuraina	Whole plant	Fresh aerial plant boiled with water and extract taken by twice daily
<i>Cassia fistula</i> L.	Caesalpiniaceae	Amaltas	Root	Root is taken orally in empty stomach ones in a week for 5 weeks
<i>Centella asiaticao</i> L.	Umbelliferae	Brahmi	Whole plant	Plant extract mixed with rhizome past of <i>Curcuma domestica</i> is given internally before breakfast in jaundice
<i>Curcuma domestica</i> L.	Zingiberaceae	Hardi, haldi	Rhizo me /tuber	Raw tuber/rhizome paste is taken orally for 7 days
<i>Lawsonia inermis</i> Linn.	Lythraceae	Mehandi	Root	Extract of root is given twice a day as health tonic for liver and general weakness
<i>Mimosa pudica</i> L.	Mimosaceae	Chhui-mui	Root/rhizome	Decoction of rhizome given daily
<i>Momordica charantia</i> L.	Cucurbitaceae	Karella	Fruit, leaves	Extract of leaves and fruit is given before breakfast
<i>Phyllanthus fraternus</i> Webster	Euphorbiaceae	Bhuiamla, dalgola,	Whole plant	About 10gpaste of whole plant is given thrice daily for one week for both infective hepatitis and chronic liver problems associated with liver cirrhosis due to alcoholism
<i>Ricinus communis</i> L.	Euphorbiaceae	Redi, arandi	Leaves	Leaf juice mixed with seven cumin seed is used internally for jaundice
<i>Solanum nigrum</i> L.	Solonaceae	Makoi	leaves	Fresh leaves juice twice daily
Neurological diseases				
<i>Abrus precatorius</i> L.	Fabaceae	Gumchi	Whole plant	Leaf made into a paste and then applied locally to cure muscle contusion
<i>Acorus calamus</i> L.	Acoraceae	Bach	Root	Used as rejuvenator of the brain and nervous system and to cure brain disorder
<i>Bacopa monneri</i>	Plantaginaceae	Jal brahmi,	Whole plant	Used as brain tonic to sharpens dull memory and improves intelligence
<i>Bombax cieba</i>	Malvaceae	Semul	Bark	Bark is boiled with water and extract is taken as analgesic, and in haemorrhage
<i>Calotropis gigantean</i> R. Br.	Asclepiadaceae	Akahuwa, AK	Leaves	Two younger leaves are taken before sunrise in case of migraine.
<i>Cannabis sativa</i>	Canabaceae	Bhang	Leaves	Against anaemia of brain and migraine
<i>Centella asiaticao</i> L.	Umbelliferae	Brahmi	Whole plant	Used as brain tonic to sharpens dull memory and improves intelligence
Ophthalmic diseases				
<i>Achyranthes aspera</i> L.	Amranthaceae	Latjira, chirchira	Root	Chewing root for a week to cure night blindness
<i>Butea monosperma</i> Lamk.	Fabaceae	Dhak, palash	Root	Extract from the root as eye drop in night blindness

Table 1: Continued

Disease				
Botanical name	Family	Local name	Part used	Mode of administration
<i>Coccinia grandis</i> (L.) J. Voigt	Cucurbitaceae	Bankundri	Root	Paste of root as eye drops once a day for three days
<i>Mimosa pudica</i> L.	Mimosaceae	Chhui-mui	Leaves	Paste of leaves applied externally in conjunctivitis
<i>Opuntia dillenii</i> Haw	Cactaceae	Nagapheni	Pulp	Decoction of the pulp is applied externally in case of eye diseases
<i>Ocimum sanctum</i> L.	Lamiaceae	Tulsi	Leaves	Juice of the leaf is applied externally in case of night blindness
<i>Solanum xanthocarpum</i> Schrad and Wendl	Solanaceae	Kantakari	Leaves and stem	Juice of leaves as eye drop in eye pain
Piles				
<i>Abutilon indicum</i> L.	Malvaceae	Kanghi, atibala	Seed, leaves	Cooked and eaten daily to cure the piles
<i>Achyranthes aspera</i> L.	Amranthaceae	Latjira, chirchira	Fruit	Application of its fruit powder arrests the bleeding in piles
<i>Aegle marmelos</i> L.	Rutaceae	Bel, bilva	Fruit	Ripe fruit pulp is given twice a day to improve the disorder
<i>Allium cepa</i> L.	Apiaceae	Piyaz	Bulb	Juice of bulb given orally twice daily
<i>Azadirachta indica</i> A. Juss.	Meliaceae	Neem	Fruits, Bark	Bark powder with jiggery every morning, 3, 4 fruits administered with water in bleeding piles
<i>Coccinia grandis</i> (L.) J. Voigt	Cucurbitaceae	Bankundri	Whole plant	Whole plant paste with black pepper powder is given thrice a day in piles
<i>Butea monosperma</i> Lamk.	Fabaceae	Dhak, palash	Bark, Fruits	Bark paste applied on piles and Fruit is cooked as carry and eaten for piles
<i>Carica papaya</i> L.	Caricaceae	Papita	Fruit	Ripe fruit pulp is given twice a day for 2-3 days to improve the disorder
<i>Curcuma domestica</i> L.	Zingiberaceae	Hardi, haldi	Rhizome	Paste of fresh rhizome with equal amount of sugar candy is given empty stomach with cold water for 21 days to cure blood setting piles
<i>Ficus bhengalensis</i> L.	Moraceae	Bargad	Root, Bark	Paste of about 10 g adventitious roots with 3-4 cloves (<i>Syzygium aromaticum</i>) is taken with bark juice in empty stomach, twice a day for 3-4 weeks to cure fissure
<i>Ficus glomerata</i> Roxb.	Moraceae	Gular	Latex	Latex is applied externally on piles
<i>Mimosa pudica</i> L.	Mimosaceae	Chhui-mui	Whole plant	Decoction of whole plant is given in bleeding piles
<i>Momordica charantia</i> L.	Cucurbitaceae	Karella	Fruit	One-tsp. bitter gourd juice with sugar twice a day stops blood oozing from piles
<i>Solanum nigrum</i> L.	Solanaceae	Makoi	Leaves	Leaves juice and leaf paste applied externally
<i>Sphaeranthus indicus</i> L.	Asteraceae	Ghundi	Whole plant	Plant extract with castor oil and cumin seed taken orally for bleeding piles
<i>Terminalia chebula</i> Retz.	Combretaceae	Harre, harida	Seed	Seed paste is applied on piles to stop bleeding and to get relief from pain

Table 1: Continued

Disease				
Botanical name	Family	Local name	Part used	Mode of administration
Skeletal diseases				
<i>Acorus calamus</i> L.	Acoraceae	Bach	Rhizomes	Decoction of rhizome taken orally in arthritis
<i>Alistonia scholaris</i> L.	Apocynaceae	Chatwan, ghatuan	Bark	The bark powder is taken for rheumatic pain
<i>Anisomela indica</i> L.	Lamiaceae	Basinga Kala bhangra	Leaves	Decoction of leaves given orally rheumatism
<i>Callicarpa macrophylla</i> Vahl.	Verbanaceae	Daia	Leaves	Heated leaves applied on rheumatoid arthritis
<i>Cannabis sativa</i>	Canabaceae	Bhang	Leaves	Leaves paste used in fracture
<i>Cassia tora</i> L.	Caesalpiniaceae	Chakvad, chakunda	Leaves	Past pounded with egg albumin to heal bone fracture
<i>Madhuca indica</i> Gmelin	Sapotaceae	Mahua	Whole plant	Decoction taken orally in rheumatism
<i>Mimosa pudica</i> L.	Mimosaceae	Chhui-mui	Mature root	Root decoction given orally
<i>Moringa oleifera</i> Lam.	Moringaceae	Sahejan	Leaf	Young leaf paste with salt is applied for rheumatism
<i>Ricinus communis</i> L.	Euphorbiaceae	Redi, arandi	Karnel, leaves	Paste of karnel in applied locally in arthritis and gout and warm paste of leaves applied on join pain
<i>Schleichera oleosa</i> (Lou.) Oken.	Sapindaceae	Kusum	Seed	Seed oil is applied gently on affected portion to cure rheumatism
<i>Sida acuta</i> , Worm f.	Malvaceae	Bariari	Root	Root decoction is taken internally for rheumatism
<i>Tinospora cordifolia</i> Willd.	Menispermaceae	Gurach	Whole plant	Whole Plant decoction is taken internally for rheumatism
Skin diseases				
<i>Ageratum conyzoides</i> L.	Asteraceae	Jangli pudica	Leaf	Leaf juice is applied externally on leprosy and other skin diseases
<i>Anisomela indica</i> L.	Lamiaceae	Basinga kala bhangra	Leaves	Leaf decoction is used to treat skin diseases
<i>Argemone mexicana</i> L.	Papaveraceae	Bhundo katila,	Whole plant	Plant paste used externally in leprosy
<i>Azadirachta indica</i> A. Juss.	Meliaceae	Neem	Seed, leaves	Leaf paste is used externally for chicken pox, scabies, and leprosy
<i>Calotropis gigantean</i> R. Br.	Asclepiadaceae	Akahuwa, AK	Latex	Latex applied on skin directly to cure from scabies
<i>Cassia fistula</i> L.	Caesalpiniaceae	Amaltas	Leaf, bark	Leaf paste is used as poultice in leprosy and other skin diseases. Bark decoction is used for bath in leprosy and other skin diseases
<i>Coccinia grandis</i> (L.) J. Voigt	Cucurbitaceae	Bankundri	Whole plant	Poultice on skin eruption. Paste, leaves and roots is used externally in treatment of leprosy
<i>Cuscuta reflexa</i> Roxb.	Convolvulaceae	Amarbel/Sewanli	Whole plant	Paste of plant is applied on skin against itching
<i>Cassia fistula</i> L.	Caesalpiniaceae	Amaltas	Bark, leaves	Bark against scabies, tender leaves against ringworm
<i>Cassia tora</i> L.	Caesalpiniaceae	Chakvad, chakunda	Leaf	Paste of leaves is applied on skin to cure skin diseases

Table 1: Continued

Disease				
Botanical name	Family	Local name	Part used	Mode of administration
<i>Ficus religiosa</i> L.	Moraceae	Peepal	Bark	Bark (50 g) crushed with 5 g <i>Curcuma domestica</i> powder is applied externally for skin disease
<i>Ichnocarpus frutescens</i> R.Br.	Apocynaceae	Sukhnidra	Root	Root paste is applied locally to treat (L.) scabies
<i>Schleichera oleosa</i> (Lou.)Oken.	Sapindaceae	Kusum	Fruit	Fruit paste is used in skin itching
<i>Lawsonia inermis</i> Linn.	Lythraceae	Mehandi	Leaf	Leaf paste is applied for leprosy, burn and skin diseases
<i>Mimosa pudica</i> L.	Mimosaceae	Chhui-mui,	Leaf	Leaves paste used externally in Leucoderma, smallpox
<i>Morus alba</i> L. (<i>Morus indica</i> L)	Moraceae	Toot	Leaf	Leaf extract used externally in small pox, bed sores and for fairness
<i>Mucuna pruriens</i> (L.) DC	Fabaceae	Kiwach, kaunch,	Leaf	Leaves paste used in ring worm.
<i>Solanum indicum</i> L.	Solonaceae	Bhatkatia	Leaf	Juice from leaves is applied locally applied to treat skin infections
<i>Terminalia chebula</i> Retz.	(Combretaceae),	Harre, harida	Fruit	Paste of the peel with castor oil and vinegar reduce the scar.
Snake-bite				
<i>Anisomela indica</i> L.	Lamiaceae	Basinga kala bhangra	Leaves	Decoction given orally
<i>Bombax cieba</i>	Malvaceae	Semul	Leaf	Leaf paste is applied in bitten spot in case of snake bite
<i>Cannabis sativa</i>	Canabaceae	Bhang	Leaf	Fresh leaves juice to wash wound.
<i>Capparis zeylanica</i> L.	Capparaceae	Jakham Bel	Seed paste	Seed paste used externally
<i>Calotropis gigantean</i> (L.) R.Br.	Asclepiadaceae	Ak	Leaf	Leaf juice mixed with cardamom, mutton and jaggery is given orally as antidote
<i>Moringa oleifera</i> Lam.	Moringaceae	Sahinjan, mungan,	Leaves, seeds	Leaf and seed juice given orally as antidote.
<i>Rauwolfia serpentina</i> L.	Apocynaceae	Jhabarbarua	Root	Root powder is mixed with black pepper and one tea spoonful is taken with a cup of water twice day for two days

in medicinal plant resources. An attempt was made to collect information on the traditional medicinal knowledge present with the local folks and tribes. However, more in depth information may be explored from the tribes residing in the remote forest areas of the districts.

CONCLUSIONS

The study indicated that, the study area is rich in plants having ethno-medicinal properties that may cures wide spectrum of human ailments and. It is evident from the interviews conducted during study; knowledge of medicinal plants is limited to traditional healers, elders and tribes who are living in rural areas. Due to lack of interest among the new generation as well as their charms toward cities for lucrative jobs, there is possibility of losing this wealth of traditional knowledge in future. Thus there is need to preserves this wealth through proper documentation. This study also highlights the need for further investigation on biochemical and pharmaceutical aspects of these traditional system of medicine.

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