

ETHNOBOTANICAL STUDY OF WILD PLANTS OF PARSA DISTRICT, NEPAL

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ABSTRACT

The present study was carried out to assess ethnobotanical information of some wild plants used by the Tharu community of Parsa district of Nepal. The study was conducted in four villages; Gadi, Madhuban mathwal, Sonbarsa and Shanker Sharaiya. The study focuses on the ethno botanical practices of the Tharu community and documentation of the traditional knowledge for the benefit of mankind. The information presented in this paper was gathered by frequent field visits in the villages, participatory observations, group discussion, interviews with local knowledgeable people in the year 2013 from February to November. A total of 46 ethnomedicinal wild plant species belonging to 31 families and 44 genera are documented in this study. Some new ethno medicinal uses of the plant species like *Ficus benghalensis*, *Gymnema sylvestre*, *Mimosa pudica*, *Oroxylum indicum*, *Hibiscus-rosa sinensis*, *Hydragia anomala*, *Matricaria chamomilla*, *Kalanchoe spathelata*, *Leucas cephalotes*, *Madhuca indica*, *Murraya koenigii*, *Melia azedarachta*, *Mentha arvensis*, *Nephrolepis cordifolia*, *Morus alba*, *Nyctanthes arbortritis*, *Ocimum sanctum*, *Oxalis corniculata*, *Phyllanthus amarus*, *Plumbago zeylanica*, *Pterocarpus marsupium*, *Putranjiva roxburghii* and *Rauwolfia serpentine* among Tharu community of Parsa district of Nepal are discussed in the present study.

Key words: Ethnobotany, Tharu, Medicinal plants, Diseases.

INTRODUCTION

The interactions between plants and people have been established along with the evolution of human beings (Martin 1995). The contribution of plant resources to health of rural people is extremely important because more than 80 percent of the population rely on traditional medicinal systems for their health care (WHO 2002; Shrestha and Dhillon 2003). Nepal comprises about 6,500 flowering plants and there are over 2000 species of plants with ethnobotanical importance out of which about 1,600 species of plants have been estimated

to be used in traditional medicine and a majority of which awaits proper documentation (Shrestha and Shakya 2000). Scientists in Nepal are deeply distressed over the losses of Nepal's biodiversity and indigenous knowledge of the communities and have pledged themselves to find a way to arrest this destruction (Chaudhary 1998, HMG 2001). Ethnobotanical study based upon Tharu community has been also done in Parsa (Yadav 1999), and other parts of the country; Ethnobotanical study of Tharu tribes of Chitwan district (Dangol and Gurung 1991, 2000). Although, ethnobotanical

studies have been done in many different parts of the country but, comparatively very less work has been done in Parsa district. Particularly in four VDC's where this study was carried out, this type of work has been not done before this work. The aim of the present work is to explore new ethnobotanical use of the wild plants in the local community as well as documentation of their use value.



Fig. 1. Map of study area.

STUDY AREA

Parsa District is located between 84°8'E and 85°27'E longitude and 27° and 27°26'N latitude. The altitude of the district varies between 122 to 925 m from sea level. This study was carried out in four villages situated towards the southern side of the forest (Fig. 1). In all villages Tharu community is the major population. Although, the people also go to the health centers for their health treatment but they use plants in different ways for their primary health care.

MATERIALS AND METHODS

In order to document the utilization of the plants a total of four field surveys were carried out from March to November 2013 in the forest and adjoining four villages; Madhuwan mathwal, Gadi, Shanker sharaiya and Sonbarsa. During field stay, plants were enumerated and several times interactions were done with the traditional healers, local knowledgeable old person and other informants like forest officer and few local people. The plants were collected for identification. Structured questionnaires, interviews and participatory observations were used to organize the information of the resource persons. Questionnaires include use of the plants for different purposes including medicinal use, parts of the plants used and detailed information about mode of preparation of medicines such as, decoction, powder, paste, juice and mixture of other plants used as ingredients. The plants were identified on the basis of related flora (HMG Nepal 1970, 1984, 2001, Stainton 1988, Hooker 1883) and verified by cross checking with the authentic voucher specimens presented in the National Herbarium and Plant Laboratory, Godavari, KTM, Nepal. The use of various medicinal plants reported in this study was compared with previously published ethnobotanical literature in Nepal and also adjoining areas of India.

RESULTS AND DISCUSSION

Ethnobotanical uses of the studied plants

Aegle marmelos (L.) Correa (Rutaceae)

Medicinal value: Pulp of ripe fruit is used to cure chronic dysentery. The decoction of the root and stem bark is used to cure intermittent fever.

The slice of pulps of unripe fruit is soaked in oil for a week. It is rubbed over the body before bathing to remove the peculiar burning sensation in the soles of the feet. Decoction of unripe fruit is used to cure acute and chronic diarrhea

Other uses: Mature tree gives timber but as there is no heart wood so not durable.

***Ficus benghalensis* (L.) (Moraceae)**

Medicinal value: 5-6 young leaves or soft part of prop root mixed with little amount of lentil and paste is made by adding water. This paste is applied on face to enhance facial glow. The paste of equal amount of old yellow leaves, seeds of *Vitex negundo*, lotus flower and saffron is applied to the face to beautify it. Milky latex few drops mixed with mustard oil, few drops of this mixture is dropped in ear to kill worms or heal wounds in ear. 20-25 g ash of old leaves mixed with 100 g flax oil. Doing massage with this mixture on head regularly for minimum 15 days controls hair loss and baldness. Fresh young leaves is cooked in equal amount of mustard oil and filtered. This oil is used to cure all problems of hair. Stem bark, Catha and black pepper taken in ratio of 2:1:0.5 and finely grinded and used as tooth powder. It cleans teeth and removes bad odor of mouth. Few drops of milky latex applied on tooth either directly or cotton moist with latex, cures toothache. Decoction of dry leaves powder given in the morning and evening for few days cures excessive sleep problems. Decoction of young 5-6 leaves cures chronic diarrhea and dysentery. About 10 drops of latex taken with a cup of milk helps in the treatment of piles. Powder of aerial root is given to females to cure sterility. Fine stem bark mixed with sugar candy in ratio of 1:2, is taken with half a tea spoon of boiled cow milk in the morning and evening to enhance memory power.

Other uses: The green leaves are used as fodder.

***Ficus racemosa* (L.) (Moraceae)**

Medicinal value: Decoction of bark is made with little amount of Catha and alum. Gargling with this decoction cures mouth problem. Bleeding from any part of the body like nose bleeding, bleeding in urine, excessive bleeding during menstruation or

miscarriage, two or three ripened fruit is taken with sugar or jaggery three times a day. Powder of dry unripened fruit mixed with sugar candy taken with water in morning and evening for 2 days to cure blood dysentery.

Four or five drops of latex putting on sugar crystal (Batasa) used twice or thrice a day controls blood dysentery. The paste of stem bark (about 20-30 g) is applied on soles to control regular nose bleeding problem. Decoction of fresh or dry root is used regularly in morning and evening for one month to check miscarriage. Cotton dipped in latex is applied on anus to cure anal problems like piles or fistula. Ten to twenty drops of latex mixed with equal amount of water is taken to treat bleeding piles. Latex mixed with sugar candy and water is taken used in morning and evening to control leucorrhoea.

Eight to ten drops of latex on sugar crystal (Batasa), if taken daily for few days helps in controlling any type of urine problem. Leaf paste mixed with honey is taken orally to control internal heat of the body especially in summer season. Paste of bark is applied externally to reduce swelling in any part of the body. Fresh juice of ripe fruit is given in diabetes and other and urinary complaints. Paste of the fruit and stem bark in equal amount applied externally to cure leprosy.

***Ficus religiosa* (L.) (Moraceae)**

Medicinal value: Leaf juice is very much useful for patients suffering from jaundice.

***Gardenia jasminoides* (L.) (Rubiaceae)**

Medicinal value: Paste of seed is used in rheumatoid arthritis.

Other uses: It is cultivated as an ornamental plant in the garden. Fruits are used as food and flowers in making necklace. Fruit yields yellow dye to color clothes and food items.

***Garuga pinnata* (L.) (Berseraceae)**

Medicinal value: The juice of the leaves is good for asthma. The fruits are useful in killing roundworm and also in gastropathy. Stem juice is dropped into eyes in conjunctiva.

***Gymnema sylvestre* (R.) Br. (Asclepiadaceae)**

Medicinal value: Leaf decoction is used to increase hemoglobin level. It is also used to cure cough and cold and to reduce body weight. The tribal's use it to cure malaria. It is also used against snake bite and as an antidote.

***Hibiscus rosa-sinensis* (L.) (Malvaceae)**

Medicinal value: Flower extract has been traditionally used for liver disorders, high blood pressure. The paste of young leaves and flowers are applied on forehead in case of headache.

***Holarrhena pubescens* (Wall.) G. Don. (Apocynaceae)**

Medicinal value: The bark powder is used in the treatment of amoebic dysentery and diarrhea. It is also used in the treatment of piles and chest infections. A hot decoction of the bark is used as a gargle in toothache.

Other uses: The wood is used for making picture, frames, toys, spoons, walking sticks and also for furniture and plough.

***Hydrangea anomala* (D. Don.) (Hydrangeaceae)**

Medicinal value: Decoction of leaf or root is used to cure kidney and bladder stone. The paste of bark is used externally to cure wounds or burns. Roots are used in the treatment of malaria.

Other uses: It is also cultivated as an ornamental plant. Dried stem is used as fire wood.

***Imperata cylindrica* (L.) Beauv. (Poaceae)**

Medicinal value: The paste of rhizome is used as skin softener.

Other uses: Leaves are used in thatching roof, making rope and paper.

***Indigofera pulchella* (L.) (Fabaceae)**

Medicinal value: Decoction of the root is used in the treatment of cough. The root is dried and grinded into powder and its paste is applied externally for the treatment of pain in the chest.

Other uses: Flowers are used for vegetable purposes.

***Ipomea muricata* (L.) (Convolvulaceae)**

Medicinal value: Powder of seeds is used for the treatment of diabetic, dysentery, constipation, arthritis, rheumatism, meningitis, kidney ailments and pharyngitis.

Other uses: Green pod is used as vegetable.

***Jasminum auriculatum* (Vahl.) (Oleaceae)**

Medicinal value: The dried root powder is used in the treatment of skin diseases especially for ringworms. Fresh young leaves are chewed to cure ulceration of mouth. Flowers are used in the treatment of tuberculosis by applying its paste externally.

Other uses: The flower is used to worship all forms of Goddess Devi and in various religious ceremonies. It is also used in making perfumes and incense stick.

***Kalanchoe spathelata* (Dc.) (Crassulaceae)**

Medicinal value: In traditional medicine, leaves are used in treatment of hypertension by chewing it in empty stomach. The leaf juice is also used to heal cuts, wounds and insect bites.

***Lagerstroemia parviflora* (L.) (Lythraceae)**

Other uses: It produces valuable timber. It is also used as fuel wood and making wood charcoal.

***Lawsonia inermis* (L.) (Lythraceae)**

Medicinal value: The fresh leaves are grinded and gargled to treat mouth ulcer.

Other uses: Leaves are used in staining body. It is also used as hair dye.

***Leucas cephalotes* (Roth.) Spreng. (Lamiaceae)**

Medicinal value: The syrup obtained from the flowers is used in case of cough and cold. The decoction of the tender part is used in the treatment of malarial fever.

***Litsea monopetala* (Roxb.) Pers. (Lauraceae)**

Medicinal value: The infusion of bark is used with sugar to treat diarrhea and dysentery. The powdered bark is applied to relieve the pains and to the fracture part in case of animal. The leaf decoction is used in the treatment of diarrhea and dysentery.

Other uses: It is used as a fodder tree. Wood is used for making agricultural implements.

***Lygodium japonicum* (Thumb.) Sn. (Schizaeaceae)**

Medicinal value: The decoction of the vegetative parts is used as a diuretic. Decoction of the seeds is used to cure the kidney and urinary problems. Tribal's use the paste of the plant leaf in ringworm, eczema and wounds.

Other uses: It is also used for making basket, hat and boxes.

***Madhuca indica* (Nvchar.) (Sapotaceae)**

Medicinal value: Flowers are effective in increasing flow of milk in lactating mothers. Seeds control diabetes. It stimulates insulin production and also controls the hormones which increase the blood glucose level. The oil extracted from the seeds is also a remedy for skin disease, headache, rheumatism and arthritis. Decoction of bark is an excellent gargle for bleeding and spongy gum, chronic tonsillitis and pharyngitis.

***Mallotus philippensis* (Lam.) Muell. Arg. (Euphorbiaceae)**

Medicinal value: The dry plant parts roots and fruits are used for medicinal purposes in Ayurvedic

medicine to relieve cough, constipation, flatulence, wounds and ulcers.

Other uses: Powder of petal is used to produce red dye for coloring silk and wool.

***Matricaria chamomilla* (L.) (Asteraceae)**

Medicinal value: The infusion of dry flowers is used as herbal medicine for sore stomach and irritable bowel syndrome and powder as a mild laxative.

Other uses: The two spoons of dried flowers are used for the preparation of one cup of tea. It is boiled 10-15 min and this evaporates the volatile oil. This tea is also used as medicine to treat problems of digestive system.

***Melia azedarachta* (L.) (Meliaceae)**

Medicinal value: Aqueous and alcoholic extracts of leaves and seeds controls many insects, mites and nematodes. Leaf decoction is also used in piles, gingivitis, pyrexia and gonorrhoea.

Other uses: The timber is used for making agricultural implements, furniture and boxes.

***Mentha arvensis* (L.) (Lamiaceae)**

Medicinal value: Leaf juice is applied externally on painful joints or muscles.. Tea made from leaves and flowers is an excellent remedy for treatment of indigestion, flatulence, nausea and vomiting.

***Michelia champaca* (L.) Baill. Pierre. (Magnoliaceae)**

Medicinal value: Powdered bark is used in fever. An infusion or decoction of the flowers used for dyspepsia, nausea and fever.

***Mimosa pudica* (L.) (Fabaceae)**

Medicinal value: About 50 mg of leaf juice, if used regularly cures gland tumor. Leaf juice or decoction helps to control sinus disorder. Root tied

on neck cures cough and cold. It is a surprising miracle. One tea spoon fresh leaf juice is used to cure diarrhea and dysentery. Decoction of root is used to remove stone from any part of the body. Leaf juice is used in neurological problems.

***Morus alba* (L.) (Moraceae)**

Medicinal value: The bark decoction is used to treat fever. The root bark powder is used to reduce toothache and dental caries. Fruits are used to purify blood and in constipation.

Other uses: The leaves are used to as feedstock for silkworms. It is also cultivated as an ornamental tree.

***Mucuna pruriens* (L.) Dc. (Fabaceae)**

Medicinal value: The leaf extract is used in snake bite.. The dried seeds are boiled in cow milk, and then seeds are dried in shade after which seeds are powdered and combined with cow milk. This combination is effective in treating male sterility and nervous diseases.

Other uses: It is used as an important forage and green manure crop. Cooked fresh shoot or fruits are edible.

***Murraya koenigii* ((L.) Spreng. Rutaceae)**

Medicinal value: Leaves protects liver. Decoction of root bark is used in case of stomachic. Green leaves are eaten raw to cure dysentery. Decoction of leaves is given in snake bite.

Other uses: The leaves are used in many dishes as flavoring.

***Nephrolepsis cordifolia* (L.) K. Pres. (Nephrolepidaceae)**

Medicinal value: Paste of the leaves is applied on wound to check bleeding. Fresh watery tubers are eaten in stomach ulcer. Decoction of tubers is given to cure cough and intestinal disorders.

***Nyctanthes arbortristis* (L.) (Oleaceae)**

Medicinal value: Juice of the leaves is used as digestive, antidote to reptile venoms, tonic, laxative, diaphoretic and diuretic. Traditionally the powdered stem bark is given in rheumatic joint pain, in treatment of malaria and also used as an expectorant. Root decoction is used in enlargement of spleen.

***Ocimum sanctum* (L.) (Lamiaceae)**

Medicinal value: Leaves are effective in skin rashes, insect bites and itching. The paste or juice of leaves help to reduce acne, pimples and scars. Consuming 10-12 leaves per day helps to reduce stress. Consuming little amount of seeds is effective in premature ejaculation. It also increases quantity of semen. It also reduces blood sugar and blood cholesterol. A mixture of leaves and seeds with black pepper is given to pregnant women suffering from malaria. Fresh flowers are used to treat cough and colds.

***Oroxylum indicum* (L.) Benth. (Bignoniaceae)**

Medicinal value: Gargling with root bark decoction cures mouth ulcer. Root bark powder or infusion is used to cure intestinal problems. It also stimulates appetite. Root bark powder is taken internally or applied on wounds to prevent infection. 20-20 gm of root bark decoction strengthens body immune system. The paste prepared with root bark powder and sesame oil is taken as digestive tonic.

A wooden tumbler of this plant is filled with water at night. This water is taken in the morning, if it is done regularly for few days, malarial fever and even any types of fever can be cured. This is a surprising effect. About 125 mg to 250 mg stem bark powder taken twice or thrice a day regularly with water helps in arthritis problem. Poultice of warm leaf on joints also reduce joints pain.

Other uses: Long young pods are eaten as food.

***Osmanthus fragrans* (Lour.) (Oleaceae)**

Medicinal value: strong smell of the flower has insect-repelling properties. Decoction of bark and root helps reduce skin infection and wound healing.

Other uses: Flowers are used for flavoring tea. It is also used in perfumery and flavoring of food items.

***Oxalis corniculata* (L.) (Oxalidaceae)**

Medicinal value: The decoction of the leaves is used as anthelmintic. It is also used in the treatment of influenza, fever, urinary tract infection, and diarrhea and also in poisonous snake bites. Children's are given the decoction to cure hook worms.

Other uses: Yellow dye is obtained from flowers.

***Passiflora edulis* (Sims.) (Passifloraceae)**

Medicinal value: Decoction or infusion of flower is used to treat, nervous disorder, arthritis, asthma, insomnia, gastro intestinal disorders and menopause symptoms. Fresh leaves are eaten to lower blood pressure.

***Phyllanthus amarus* (Schumach.) Thinn. (Euphorbiaceae)**

Medicinal value: This plant is traditional Ayurvedic herb used for the treatment of jaundice. Leaves of the plant are used in diabetes. Roots rich in water are remedy for menorrhagia. Whole plant is useful in intermittent fever, ulcers and wounds. Roots and fruits are crushed and mixed with goat's milk and this mixture is taken orally to treat liver problem.

***Phyllanthus emblica* (L.) (Euphorbiaceae)**

Medicinal value: In traditional medicine, dried and fresh fruits of the plant are used. It is used to cure sore throat inflammation. Fresh roots are beneficial in jaundice. Decoction of leaves is used as a refrigerant for the scalp.

Other uses: Fruit is used to prepare pickle.

***Piper betle* (L.) (Piperaceae)**

Medicinal value: Chewing betel leaf is a remedy for bad breath and provides mouth refreshment. Betel leaf juice is mixed with warm water and given to small children to improve digestion as well as those suffering from indigestion. Leaf juice with mixed with milk and sugar is used for easing urination. The leaves are used to reduce cough and cold when they are soaked in mustard oil and warmed and placed on the chest.

***Plumbago zeylanica* (L.) (plumbagenaceae)**

Medicinal value: The root contains potent medicinal properties but taken in small doses, otherwise paralysis and death could result. The root decoction helps in digestion and to promote appetite. Paste of root is applied to skin to treat skin diseases including ulcer and scabies. The paste of bark cures baldness.

***Premna integrifolia* (L.) (Verbinaceae)**

Medicinal value: Leaf decoction is used in the treatment of stomach ailments. Root bark decoction is used for fever, liver complaints, rheumatism and neuralgia. Root or stem bark powder is used as laxative, carminative and stomachic.

Other uses: Wood is used for making tools. Bark is used for making rope.

***Pterocarpus marsupium* (Roxb.) (Fabaceae)**

Medicinal value: The heartwood is used in making tumbler. Water kept overnight in the tumbler is used to cure diabetes. The gum is the only herbal product ever found to regenerate beta cells that produce insulin in the pancreas.

***Putranjiva roxburghii* (Wall.) (Putranjivaceae)**

Medicinal value: Decoction or powder of bark has regenerative and restorative properties for the female reproductive system and their overall

health. Decoction of leaves and fruits is improves no. of healthy sperms.

***Quisqualis indica* (L.) (Combretaceae)**

Medicinal value: Dried seeds are used for deworming for which 8-10 nuts are chewed by adults after the meal followed by half glass of water. Roasted nuts are used in the treatment of diarrhea and fever. Leaves applied to the head to relieve headache. Powdered leaves are used externally for skin diseases.

Other use: Flowers are edible.

***Rauvolfia serpentina* (L.) Benth. (Apocynaceae)**

Medicinal value: Extract of the root is used in the treatment of intestinal disorders like, diarrhea, dysentery, cholera and uterine contraction during childbirth. Root juice is taken to get relief from malarial fever. Root paste is applied to the affected parts of snakebite.

Other uses: It is believed that snake does not come near to this plant.

In Table 1 data obtained from the field survey are presented. In this study 46 species belonging to 31 families distributed in 44 genera have been recorded including their detail ethnobotanical value. Largest numbers of plants have been found in the two families Fabaceae (4 species) and Moraceae (4 species) and then in three families Oleaceae (3 species), Lamiaceae (3 species) and Euphorbiaceae (3 species) where as families Rutaceae (2 species), Lythraceae (2 species) and Apocynaceae (2 species) are the third largest families. Leaf of *Gymnema sylveste*, *Murraya koenigii* and *Oxalis corniculata*, plant body of *Mucuna pruriens*, seeds of *Oroxylum indicum* and root of *Rauvofia serpentina* are used in snake bite.

Out of total studied plants depending upon the habit, 18 plants (39%) are tree, 10 plants (22%) are

shrubs, 10 plants (22%) are herbs and 8 plants (17%) are climbers (Fig. 2). Similarly, leaves of 30 plants, bark of 25 plants, root of 14 plants, flower of 13 plants, fruits of 11 plants, seed of 7 plants, wood of 4 plants, stem of 2 plants, latex of 2 plants and rhizome of 2 plants is used for different purposes (Fig. 3). From the total studied plants 20 plants are used only for medicinal purposes, 25 plants are used for medicinal and other purposes where as only one plant is used as timber tree. The 25 plants used for medicine and other purposes includes; as food (6 plants), as dye (5 plants), as furniture (4 plants), religious purposes (2 plants), ornaments (2 plants), herbal tea (2 plants), thatching, incense, fodder and rope (1 plant) each (Fig. 4).

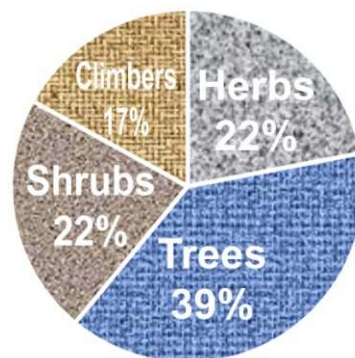


Fig. 2. Proportion of total plant species based upon their habits.

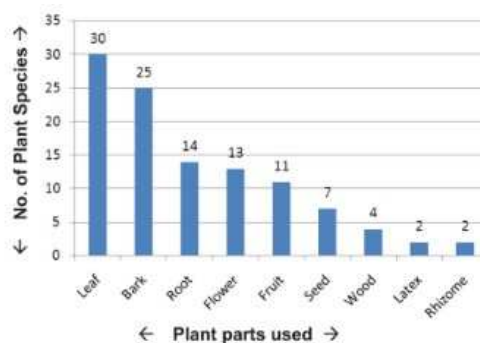


Fig. 3. Utilization pattern of different parts of plants.

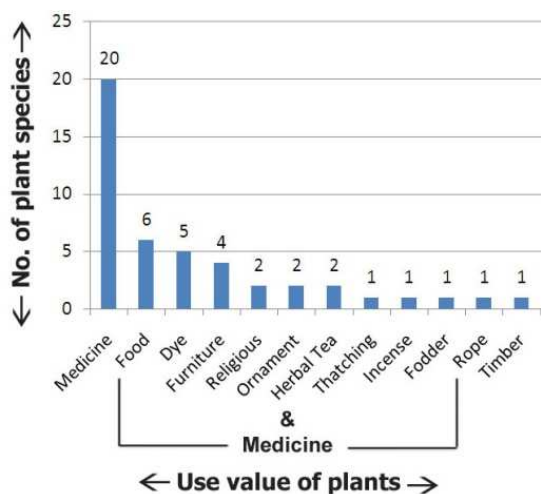


Fig. 4. Number of plant species according to their use.

Yadav (1999) mentioned use of bark and latex of *Ficus benghalensis* in skin disease, dysentery and joint pain. Similarly, Singh *et al.* (2012), in an ethanobotanical survey of medicinal plants used in Terai forest of Western Nepal, mentioned use of bark and latex in diabetes and muscular pain. Present study found the use of *Ficus benghalensis* in facial treatment, ear problem, hair loss, dental problem and to enhance memory power.

Bailung *et al.* (2016) in traditional use of plants by the Ahoms in human health management in upper Assam, India, mentioned use of *Rauvolfia serpentina* in high blood pressure. Present study found the use of this plant in diarrhea, dysentery, fever, uterine contraction during child birth and malarial fever.

Yadav (1999) mentioned ethanobotanical use of few plants in the Parsa district, where *Ficus racemosa* is used in piles, diarrhea, dysentery, *Hibiscus rosa-sinensis* in stomach trouble and boils, *Leucas cephalotes* as antiseptic, antidote for scorpion sting and cough, *Mimosa pudica* in asthma and dysentery. Shrestha and Dhillon (2003) mentioned use of *Ficus racemosa* in wound, Singh *et al.* (2012) mentioned use of *Melia azadirachta* as blood purifier and in scabies,

Mucuna pruriens in frequent urination, weakness and headache, *Mimosa pudica* in hydrocele, piles, diarrhea and leucoderma. Raut and Shrestha (2012) in ethnoveterinary practices in western Nepal, mentioned use of *Melia azadirachta* to kill intestinal worm of cattle. Sankaranarayanan *et al.* (2010), in ethanobotanical study of medicinal plants used by traditional users in Villupuram district of Tamil Nadu, India described uses of *Mucuna pruriens* in nervous diseases and *Oroxylum indicum* in cough and cold. Ignacimuthu *et al.* (2006) in ethanobotanical investigations among tribes in Madurai district of Tamil Nadu, India, mentioned use of *Gymnema sylvestris* in diabetes. Gurung *et al.* (2008) mentioned use of *Ficus benghalensis* for diabetes, *Ficus racemosa* for muscular pain, *Mimosa pudica* for jaundice and *Melia azadirachta* for body pain.

Present study recorded new uses of the studied plants like, *Gymnema sylvestris* in malaria, to reduce body weight, to increase hemoglobin level in blood, antidote to snakebite. Similarly, among Tharu community new uses of *Mimosa pudica* in gland tumor, sinus disorder; *Oroxylum indicum* in mouth ulcer, intestinal problems, malarial fever, arthritis and to increase immune system; *Hibiscus-rosa sinensis* to regulate menstruation, in high blood pressure, liver disorders and headache; *Hydrangia anomala* in malaria; *Matricaria chamomilla* in digestive system disorders; *Kalanchoe spathelata* in hypertension; *Leucas cephalotes* in malarial fever; oil of *Madhuca indica* is used in skin diseases; headache and rheumatism; *Murraya koenigii* in snake bite. Similarly, new uses of plants among Tharu community like *Melia azadirachta* for piles, gingivitis, pyrexia and gonorrhoea; *Mentha arvensis* for joint or muscular pain; *Nephrolepis cordifolia* for stomach ulcer; *Morus alba* for constipation; *Nyctanthes arbor-tritis* for spleen enlargement, rheumatic joint pain; *Ocimum sanctum* for

pregnant woman suffering from malaria; *Oxalis corniculata* to kill hookworm; *Phyllanthus amarus* to treat liver problem; *Plumbago zeylanica* to stop baldness; *Putranjiva roxburghii* to cure male and female reproductive disorders and *Rauvolfia serpentina* for contraction of uterus after child birth.

Table 1. Scientific name, family and ethnobotanical importance of plants in the study area.

SN	Scientific name	Common name	Habit	Family	Ethanobotanical Importance	Parts used
1	<i>Aegle marmelos</i> (L.) Correa	Stone Apple	Tree	Rutaceae	Med., furniture	Bark, pulp of ripe fruit
2	<i>Ficus benghalensis</i> (L.)	Banyan tree	Tree	Moraceae	Med.	Latex, leaf, bark, root
3	<i>Ficus racemosa</i> (L.)	Fig	Tree	Moraceae	Med.	Bark, leaf, root fruit
4	<i>Ficus religiosa</i> (L.)	Peepal tree	Tree	Moraceae	Med., religious	Leaf
5	<i>Gardenia jasminoides</i> (L.)	Cape jasmine	Shrub	Rubiaceae	Med. dye	Fruit, seed, flower
6	<i>Garuga pinnata</i> (L.)	Grey downy balsam	Tree	Berseraceae	Med.	Stem, leaf, fruit
7	<i>Gymnema sylvestre</i> (R.) Br.	Gymnema	Climber	Asclepiadaceae	Med.	Leaf
8	<i>Hibiscus rosa-sinensis</i> (L.)	China rose	Shrub	Malvaceae	Med., ornamental	Leaf, flower
9	<i>Holarrhena pubescens</i> (Wall.) G. Don	Bitter oleander	Tree	Apocynaceae	Med. furniture	Bark, wood
10	<i>Hydrangea anomala</i> (D. Don)	Climbing hydrangia	Climber	Hydrangenaceae	Med., ornamental	Leaf, Bark, root
11	<i>Imperata cylindrica</i> (L.) Beauv.	Thatch grass	Herb	Poaceae	Med., thatching	Rhizome, leaf
12	<i>Indigofera Pulchella</i> (L.)	True indigo	Shrub	Fabaceae	Med., veg.	Flower, root
13	<i>Ipomea muricata</i> (L.)	Clove bean	Climber	Convolvulaceae	Med., Veg.	seed
14	<i>Jasminum auriculatum</i> (Vahl.)	Arabian jasmine	Shrub	Oleaceae	Med. incense, perfume	Leaf, root, flower
15	<i>Kalanchoe spathelata</i> (Dc.)	Flame kalanchoe	Herb	Crassulaceae	Med.	Leaf
16	<i>Lagerstroemia parviflora</i> (L.)	Crape myrtle	Tree	Lythraceae	Furniture	Hard wood
17	<i>Lawsonia inermis</i> (L.)	Heena	Shrub	Lythraceae	Med., dye	Leaf
18	<i>Leucas cephalotes</i> (Roth) Spreng.	Guma	Herb	Lamiaceae	Med.	Flower, shoot
19	<i>Litsea monopetala</i> (Roxb.) Pers.	Mango laurel	Tree	Lauraceae	Med., furniture	Bark, leaf, wood
20	<i>Lygodium japonicum</i> (Thunb.) Sn.	Climbing fern	Climber	Schizaeaceae	Med.	Whole plant, seed, leaf
21	<i>Madhuca indica</i> (Nvchar.)	Indian butter	Tree	Sapotaceae	Med.	Bark, flower, seed
22	<i>Mallotus Philippensis</i> (Lam.) Muell. Arg.	Red Kamal	Tree	Euphorbiaceae	Med., dye	Root, fruit
23	<i>Matricaria chamomilla</i> (L.)	Chamomyle	Herb	Asteraceae	Med. Herbal tea	Flower
24	<i>Melia azedarachta</i> (L.)	Chinaberry	Tree	Meliaceae	Med., timber	Leaf, seed
25	<i>Mentha arvensis</i> (L.)	Mentha, Piper mint	Herb	Lamiaceae	Med.	Leaf
26	<i>Michelia Champaca</i> (L.) Baill. Pierre.	Champak	Tree	Magnoliaceae	Med.	Bark, flower

27	<i>Mimosa pudica</i> (L.)	Sensitive plant	Herb	Fabaceae	Med.	Leaf, root
28	<i>Morus alba</i> (L.)	White mulberry	Tree	Moraceae	Med., fodder	Leaf, bark, fruit
29	<i>Mucuna pruriens</i> (L.)Dc.	Cow hedge	Climber	Fabaceae	Med., food	Seed, fruit
30	<i>Murraya Koenigii</i> (L.) Spreng.	Sweet neem/ Curry leaf tree	Shrub	Rutaceae	Med.	Leaf
31	<i>Nephrolepis cordifolia</i> (L.) K. Pres.	Sword fern	Herb	Nephrolepidaceae	Med.	Leaf, rhizome
32	<i>Nyctanthes arbortristis</i> (L.)	Coral jasmine	Shrub	Oleaceae	Med.,dye	Leaf, root, flower, bark
33	<i>Ocimum sanctum</i> (L.)	Basil	Herb	Lamiaceae	Med. religious	Leaf, seed
34	<i>Oroxylum indicum</i> (L.) Benth	Indian trumpet	Tree	Bignoniaceae	Med., food	Bark, wood, fruit
35	<i>Osmanthus fragrans</i> (Lour.)	Fragrant olive	Shrub	Oleaceae	Med. essence, tea	Flower, bark, root
36	<i>Oxalis corniculata</i> (L.)	Indian sorrel	Herb	Oxalidaceae	Med. dye	Leaf, flower
37	<i>Passiflora edulis</i> (Sims.)	Passion flower	Climber	Passifloraceae	Med.	Leaf, flower
38	<i>Phyllanthus amarus</i> (Schumach.) Thonn.	Meniran	Herb	Euphorbiaceae	Med	Leaf, root, fruit
39	<i>Phyllanthus emblica</i> (L.)	Emblic myrobalan	Tree	Euphorbiaceae	Med., food	Root, leaf, fruit
40	<i>Piper betle</i> (L.)	Betel	Climber	Piperaceae	Med.	Leaf
41	<i>Plumbago zeylanica</i> (L.)	Plumbago/lead wort	Shrub	Plumbaginaceae	Med.	Root, bark
42	<i>Premna integrifolia</i> (L.)	Kannanda	Tree	Verbinaceae	Med., rope	Leaf, root and stem bark
43	<i>Pterocarpous marsupium</i> (Roxb.)	Indian kino tree	Tree	Fabaceae	Med.	Wood, gum
44	<i>Putranajiva roxburghii</i> (Wall.)	Putranjiva	Tree	Putranjivaceae	Med.	Bark, leaf, fruit
45	<i>Quisqualis indica</i> (L.)	Jasmine hollard	Climber	Combretaceae	Med., food	Leaf, seed, flower
46	<i>Rauwolfia serpentina</i> (L.) Benth.	Snake root plant	Shrub	Apocynaceae	Med.	Root

CONCLUSION

This study shows that knowledge and uses of herbal medicines for the treatment of various diseases among the Tharu community of Parsa District is still a major part of their life and culture. They use these plants not only for the medicinal purposes but also for other purposes. The result of the present study provides evidence that these herbs play important role in the healthcare and social life of this tribal community. Documentation of these plants play great role in the biodiversity conservation and asset for the future generation. It has also opened door for the new pharmaceutical research work. Extraction and identification of effective chemicals can prove discovery of new medicine for the humanity.

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