

## Ethnobotany of Tharu community of Pakali, Sunsari, Nepal

Shravan Kumar Chaudhary\* and Shiva Kumar Rai

Department of Botany, Post Graduate Campus, T.U., Biratnagar, Nepal

\*E-mail: shravan1221@gmail.com

### Abstract

Ethnobotany of Tharu community of Pakali, Sunsari has been studied. The study identified a total 119 plants under 92 genera and 52 families using by them for different purposes such as traditional medicinal practices (92.4% plants), cultural and religious ceremonies (27.7% plants), edible (37.8% plants), fodder (17.6% plants) etc. The community is using large number of plants for the treatment of more than 60 human diseases. Maximum plants (17.74) are used for stomach problem and then expelling worm, skin disease, diarrhea, dysentery and cough, rheumatism, fever and eye problems. There are few but important plants which are effective in abortion, gonorrhoea, dyspepsia, appetizer, eczema, tumour, head ache, chest pain, cancer, kidney problem, cholera etc. It has been clear that the Tharu of Pakali have a good knowledge of medicinal plants and their uses.

**Key words:** Cultural ceremony, Edible plant, Gor Raja, Medicinal plant

### Introduction

Ethno-botany is defined as the systematic study of the botanical knowledge of a social group and its uses of locally available plants in foods, medicine, clothing or religious rituals. It is a multidisciplinary science of applied botany which deals with various aspects of plants in relation to human race. There is rapid surge of interest in recent years in ethno botanical studies mainly because of search for potentially new economic plants and the need for conservation and utilization of plant resources found in tribal areas for socioeconomic development. Ethno botany, a branch of economic botany deals with the role of plants in life and culture of people in general and tribal communities.

Nepal is a multi-ethnic and multilingual country where 125 caste/ethnic groups speak 123 different languages as mother tongue (CBS, 2012). The Tharu population is dispersed throughout the country mainly along the Terai plain (Terai 1,666,263; Hill 69,643; Mountain 1,564) and dominating towards the west as 288,439 in Eastern Development Region; 276,432 in Central DR; 25,7753 in Western DR; 475,579 in Mid Western DR and 439,267 in Far Western DR (CBS, 2012). There is a cultural diversity in the different ethnic groups. The tribal people are living in inaccessible remote rural areas and belief in the use of plants and its products in traditional way to cure many diseases rather than allopathic medicines. This combination of biological and cultural diversity provides unique opportunity for ethno botanical study.

Villagers are the traditional collectors of medicinal plants. They inherit knowledge about the use of herbs from their forefathers and friends. Medicinal plants, their products and traditional medicinal practices have been preserved as unwritten tribal folklore. There is no records of this knowledge about the plants having curative properties that generally get passed from one generation to another by verbally. Ethno botanical exploration in Nepal is

further needed to preserve information about plant resources in different tribal societies. The documentation of indigenous knowledge becomes quite essential to exploit the potential vegetation resources sustainably and also for the economic as well as sustainable development of the tribal people. The ethnobotanical investigation opens the probabilities of new medicines and economic plants so the ethno botany has been a subject of interest in recent year.

The word 'Tharu' is derived from two words i.e., 'Tha' and 'Ru' which literally means 'Terai' and 'permanent inhabitant' respectively. So, Tharu people are the original inhabitant or indigenous people of Terai plain of Nepal. The area or region of the country where Tharu used to inhabit since pre-historic period is known as 'Tharuwan' or 'Tharuhath'. They extended from Rajasthan to the east up to the plain of Ganges in India and up to the Terai and below the 'Chure' hill of Nepal. They inhabited these places continuously since pre-historic age. They introduced or included many other communities into their society to increase their population and social activities.

The Tharu people mainly live in the Surkhet valley in west mountain region, Chitwan valley, Dang valley, Deukhuri valley, Sindhuli and Udayapur in inner Terai valleys of Nepal and the Terai plains on the border of Nepal. The population of Nepal is 28,287,147, of which Tharu people make up 6.6%. A smaller number of Tharus live in India, mostly in Champaran District of Bihar and in Nainital District of Uttarakhand. The Tharu is the largest and oldest ethnic group of the Terai region, living in villages near jungles in regions that were isolated over the millennium, allowing them to develop a unique culture.

There is no one Tharu language unifying Tharu communities in different parts of Nepal. Instead, Tharu speak variants of Urdu and Awadhi in western Nepal, of Bhojपुरi in and near central Nepal, and of Maithili in and near eastern Nepal. Traditional Tharu worship various gods in the form of animals such as dogs, crow, ox and cows. Every village has their own deity, commonly known as 'Bhuinyar'. Tharu in east Nepal call their deity as 'Gor Raja'.

In Nepal, extensive explorations in the field of ethno-botany and medicinal plant have been carried out by Department of Medicinal Plant (1970) as well as various workers. It is therefore, very difficult to ascertain the exact number of newly reported ethno botanical and medicinal plants. One of the important exploration in the eastern Terai was carried out by Siwakoti and Verma (1996) reporting 212 plants under 180 genera and 79 families.

For Tharu community, Manandhar (1985) enumerated 79 species of medicinal plants from Dang Dewkhuri with their traditional use, mode of preparation, dose etc. Dangol and Gurung (1991) have studied the medicinal plants from Chitwan district specially of four Tharu villages (Meghauri, Bangain, Baghmara and Sauraha) and identified a total 71 medicinal plants. The plants were used to treat a range of diseases including headache, diarrhea and problems associated with menstruation and pregnancy. Similarly, Shreshtha and Kase (1997) studied taxonomy and ethnobotany of 'Rana Tharu' from Kanchanpur district, Nepal. Choudhary (2000) reported 105 plant species from Bhadgaun Sinuwari, Sunsari district. Shreshtha (2002) has listed 127 plant species from Tankisinuwari of Morang district. Chapagain *et al.* (2004) have studied medicinal plants from the

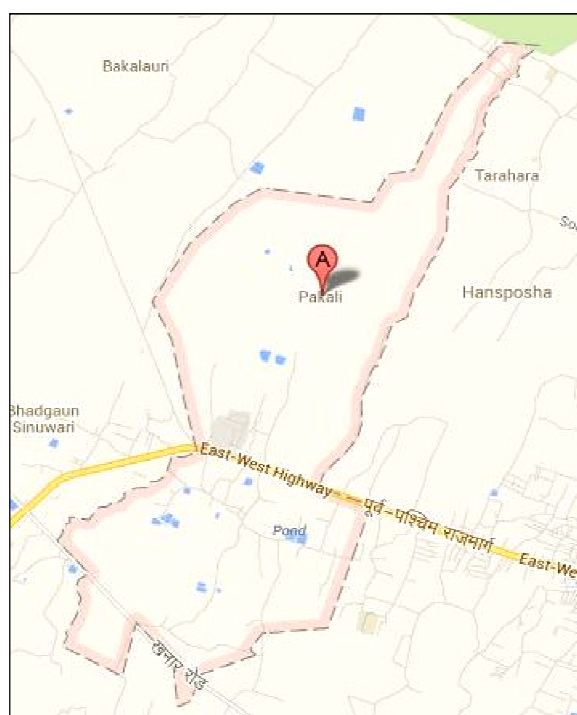
southwestern buffer zone of Royal Bardia National Park. Acharya and Acharya (2009) have reported 45 ethnobotanical plants from Rupandehi under 42 genera and 31 families. Chaudhary (2010) reported 109 plant species from Sunsari district. Singh *et al.* (2012) have studied the Terai forest of western Nepal and recorded 66 medicinal plants used to treat 11 disease categories, with the highest number of species (41) being used for gastro-intestinal disorders, followed by dermatological disorders (34). Among them, the primary sources of medicine were herbs (53%), followed by trees (23%). Literature revealed that the ethnobotany of Tharus of Pakali has not been studied yet. Thus, an endeavor is made to study the ethnobotany of Tharu community of Pakali, Sunsari, Nepal.

## Materials and Methods

### *Study area*

Pakali lies on the north-east side of the Sunsari district. It is surrounded by Baklauri in the north, Hansposha in east, Ekamba in south and Bhasi in west (Fig. 1). The main tribes inhabited here are Tharu, Brahman, Chhetri, Rai, Limbu, Musahar, Dom and Miya. Most of the villages are dominated by Tharu tribe. The nearest market places of villagers are Pakali, Jhumka and Itahari through which Mahendra Highway passes along east-west. Most of the villages are connected with each other by the bullock road. There is a big Riot Control Police (Sasstra Prahari Gana) in the middle of the VDC and Mahendra Highway passes along the middle of the VDC.

The weather is mostly fair and receives direct sunlight. The mild wind flows during winter season while its velocity increases during the late summer and monsoon season. The soil is grayish-brown in color and its pH ranges from 6.5 to 8.



**Figure 1.** Map of study area (Pakali, Sunsari District)

This is the primarily work in Tharu community of Pakali, extensively based on field, laboratory, herbarium and library studies, conducted in 2068-2069 BS. Information was gathered from Tharu peoples of this village specially from elder persons, housewives, local medicine men, veterinary persons, Dhami and Jhakri, and local leaders applying PRA and interview methods. Questionnaires were prepared and asked to them regarding the local names, ethnic name, availability, uses of plants for different purposes viz., folk medicine, edible, religious, cultural purpose etc. The information obtained were compiled, analyzed and discussed.

In the assistance of the local people and informants, plant collection was carried out, maintaining the field note with sample number and date, locality, habit and habitat, colour of flower, season of flowering and fruiting etc. Proper tagging and labeling was done. In case of grasses, sedges and other herbs, the whole plant including the under-ground parts were collected while in the case of higher plant both flowering and fruiting were taken if possible. A conformation was drawn about the uses of plants by cross-checking from different villagers. Pictures of some important plants were also taken during collection. The collected specimens were brought to the laboratory of Department of Botany, P.G. Campus and herbarium was prepared.

The specimens were carefully studied and identified with the help of literatures (Hooker, 1872-1879; Hara *et al.*, 1978, 1979-1982; Siwakoti and Verma, 1996). The identification was further conformed by crosschecking with the specimens deposited at Herbarium Section of Botany Department, P.G. Campus Biratnagar.

### Results and Discussion

The ethnobotany of Tharu community of Pakali, Sunsari District has been studied during the period of one year from 2068 to 2069. The investigations identify a total 119 plants belonging to 92 genera and 52 families using by them for different purposes as traditional medicinal practices, cultural and religious ceremonies, edible, fodder etc. (Table 1).

**Table 1.** Different plants, their parts and uses by Tharu community of Pakali, Sunsari.

Scientific name	Habit	Nepali /Tharu name	Parts used	Ailments
Family: Acanthaceae				
1. <i>Adhaotoda zeylanica</i>	Shrub	Asuro/Bakas	Leaves, roots, flowers	Bronchitis, asthma, vomiting, fever, blood purifier, jaundice, inflammation of eye, treating urinary problems, expelling worms
Family: Alismataceae				
2. <i>Sagittaria sagittifolia</i>	Herb	-	Flowers	Swelling, itching
Family: Amaranthaceae				
3. <i>Achyranthes aspera</i>	Herb	Apamarga/ Ultachichri	Roots	Abortion, fever, pneumonia
4. <i>Alternanthera sessilis</i>	Herb	Viringi-jhar/ Sarhauchi	Roots, whole plant	Stomach pain, diarrhea, dysentery, snake-bite wound, lactation
5. <i>Amaranthus spinous</i>	Herb	Banlude/ Katrasag	Roots, whole plant	Improving digestion, gonorrhea, eczema, collie
6. <i>Amaranthus viridis</i>	Herb	Lude/ Genhari-sag	Shoots, seeds	Constipation, diarrhea
7. <i>Celosia argentic</i>	Herb	Siruwale-sag/ Murgaphool	Flowers	Menstrual disorder

8. <i>Gomprena globosa</i>	Herb	Makhamali phool/ Supariphool	Flowers	Decoration, making mala
Family: Anacardiaceae				
9. <i>Magnifera indica</i>	Tree	Aanp/ Aam	Branches, leaves, fruits	Urinary problems
10. <i>Semicarpus anacardium</i>	Tree	Ranibhalayo/ Bhela, Bhelauri	Fruits	Asthma, rheumatism, cronic cough, dyspepsia, indigestion, pile, skin diseases, nervous disability
Family: Annonaceae				
11. <i>Annona reticulata</i>	Tree	Sarifa/ Aanta	Roots, roots, seeds	In cooling body, purgative, abortion, menstrual disorder
Family: Apiceae				
12. <i>Coriandrum sativum</i>	Herb	Dhaniya/ Dhaniya	Leaves, fruits, seeds	Correcting foul breath, carminative, tonic, appetite
Family: Apocynaceae				
13. <i>Rauwolfia serpentine</i>	Shrub	Sarpagandha/ Isargaj	Roots	Treating snake bite, curing high blood pressure, cardiac diseases
14. <i>Alstonia scholaris</i>	Tree	Chhatiyani/ Chhatiyani	Bark	Leprosy, dysentery, diarrhoea, fever, malaria, fever, ulcer, tumour, rheumatism, itching, improving lactation, cold fever, sinusitis, headache, skin diseases
Family: Araceae				
15. <i>Acorus calamus</i>	Herb	Bojo/ Achhaini	Rhizome	Chronic cough, fever, gastric trouble, pneumonia, killing lice, bedbug & insects
Family: Asclepiadaceae				
16. <i>Calotropis gigantea</i>	Shrub	Aank/ Aak	Roots, young flowers, latex	Joint, titanus, swelling, dysentery, snake bite, scorpion sting, earache, elephantiasis, abortion
Family: Asteraceae				
17. <i>Eclipta prostrata</i>	Herb	Bhumiraj/ Bhangari	Leaves, tender shoots, roots	Cutting, fever, antiseptic, ulcer, wound
18. <i>Elephantopus scaber</i>	Herb	Sajeevan butti/ Laxmanbutti	Roots, leaves	Diarrhea, dysentery, swelling, stomach pain, arresting vomit
19. <i>Guizotia abyssynica</i>	Herb	Filunge/ Filunge	Seeds	Rheumatism
20. <i>Tagetes erecta</i>	Herb	Sayapatri/ Genaphool	Leaves, flowers	Pneumonia, chest pain, expelling worm, purifying blood, cut or wound
21. <i>Ageratum conyzoids</i>	Herb	Ilame jhar/ Bokra	Leaves	Checking bleeding, rheumatism
Family: Bignoniaceae				
22. <i>Oroxylum indicum</i>	Tree	Totala/ Patsan	Seeds	Curing old fever
Family: Bombaceae				
23. <i>Bombax ceiba</i>	Tree	Simal/ Simar	Barks, gum, roots	Checking bleeding, dysentery, influenza, urinary infection
Family: Brassicaceae				
24. <i>Brassica campestris</i>	Herb	Tori/ Tori	Tuberous roots, leaves, seed	Rheumatism, bronchitis infection, ear pain, anti-scorbutic, oil cake for bath
25. <i>Lepidium sativum</i>	Herb	Chamsur/ Chamsur	Leaves, seeds	Increasing lactation in mother
26. <i>Brassica juncea</i>	Herb	Rayosag/ Raisag	Leaves, seeds	Rheumatism, liver pain, eye disease, as appetizer
Family: Bryophyllaceae				

27. <i>Bryophyllum pinnatum</i>	Herb	-/ Magarmous	Leaves	Boils, wounds, insects bites, healing wound, dysentery
Family: Cannabaceae				
28. <i>Cannabis sativa</i>	Herb	Ganja/ Bhang, Ganja	Leaves, flowering shoots	Abdominal trouble, as narcotic, sedative tonic, antispasmodic, breast cancer
Family: Caricaceae				
29. <i>Carica papaya</i>	Tree	Mewa/ Neba	Roots, fruits, latex	Ringworm, stomach ache, digestion, pile, kidney stone
Family: Chenopodiaceae				
30. <i>Chenopodium album</i>	Herb	Bethe/ Bethuwasag	Young plant leaves	Diabetes, constipation, increasing lactation
Family: Convolvulaceae				
31. <i>Ipomea aquatica</i>	Herb	Karmikosag/ Karmisag	Young shoots, leaves	Skin allergy, weakness, nervousness
32. <i>Ipomea batatas</i>	Herb	Sakarkanda/ Alhuwa	Roots	Carminative, as laxative, diuretic
33. <i>Ipomea carnea</i>	Shrub	Karmijhar/ Karmijhar	Stem	Curing back bone pain
Family: Cucurbitaceae				
34. <i>Mimordica charantia</i>	Herb	Titekarela/ Karela, Kareli	Fruits	Lowering B.P., curing pile
Family: Cuscutaceae				
35. <i>Cuscuta reflexa</i>	Herb	Akasbeli/ Amarlati	Whole plant	Itching, scabies, jaundice
Family: Cyperaceae				
36. <i>Cyperus differmis</i>	Herb	Pater/ Pater	Whole plant	Weaving mats
Family: Dipterocarpaceae				
37. <i>Shorea robusta</i>	Tree	Sal/ Sakuwa	Woods, leaves, fruits	Diarrhea, skin diseases, ear ache, swollen parts of body, as antiseptic
Family: Euphorbiaceae				
38. <i>Euphorbia pulcherrima</i>	Shrub	Lalupate/ Lalupate	Bark, whole plant	Skin diseases, as ornamental plants
39. <i>Jatropha curcas</i>	Shrub	Datiwan/ Banhandi	Twig, plant juice	Swelling gum & testes, skin diseases, seeds purgative, tooth brushing
40. <i>Ricinus cumminis</i>	Tree	Aadi/ Andir	Young leaves, seeds	Dryness of skin, cracking heels, swelling, jaundice, using in sericulture, oil as lubricant
Family: Leguminosae				
41. <i>Abrus precatorius</i>	Herb	Lalgedi/ Kajarnee	Seeds	Cleaning eye, as ornamental plant, cough, cold, colic pain
42. <i>Acacia catechu</i>	Tree	Khayer/ Kher	Wood	Throat congestion, indigestion, anemia, leucoderma, piles, urinary & vaginal discharge, as dyes
43. <i>Acacia nilotica</i>	Tree	Baul/ Babur	Bark, pods, leaves, gum	Skin infection, destroying bed bug, diarrhea, diabetes, mellitus, sore throats, as tonic
44. <i>Albizia labbek</i>	Tree	Siris/ Siris	Barks, leaves, fruits	Dysentery, diarrhea, stomach problem
45. <i>Bauhiniya purpurea</i>	Tree	Tanki/ Mouhali	Roots, leaves, flowers	Stomach problem, fodder, as laxative
46. <i>Cassia fistula</i>	Tree	Rajbrikshya/ Banlauri	Roots, fruits	Inflammation, chest & liver complaint, skin diseases, leprosy, burning, as purgative, tonic

47. <i>Lathyrus sphaericus</i>	Herb	Khesari/ Khesari	Leaves	In making 'BIRIYA' for future consumption
48. <i>Mimosa pudica</i>	Shrub	Lajjawati jhar/ Lajauni	Plant	Pneumonia & swollen body part
49. <i>Saraca asoka</i>	Tree	Ashok/ Ashok gachh	Leaves, flowers	Menstrual disorder, diabetes, worshipping, as ornamental
50. <i>Tamarindus indica</i>	Tree	Titri/ Tetair	Fruits, seeds	Cough, diarrhea, dysentery, digestive, carminative, laxative
51. <i>Vigna mungo</i>	Herb	Kalo daal/ Kelaike daal	Seeds, whole plants	Rheumatism
52. <i>Cajanus cajan</i>	Shrub	Arhar daal/ Rahar daal	Branches, pods, seeds	Expelling worms, kidney stone, curing skin crack face
Family: Gramineae				
53. <i>Bambusa nutans</i>	Tree	Bans/ Bans	Whole plant	Curing urinary problem in child
54. <i>Cynodon dactylon</i>	Herb	Dubo/ Duib	Aerial parts	Poor sightness, pneumonia, healing wound & burn, as MANTRA, removing foreign particle from eye
55. <i>Impereta cylindrica</i>	Herb	Siru/ Dib ghas	Roots	Pneumonia, as anthelmintic & galactagogue, as MANTRA, making garland for wedding
56. <i>Saccharum officinarum</i>	Herb	Ukhu/ Ketari, Khusyar	Stem	Jaundice, aphrodisiac, as sweet laxative, as cooling
57. <i>Saccharum spontaneum</i>	Herb	Kansh/ Khar	Stem, flower	Check bleeding, as coolant
58. <i>Thysanolaena maxima</i>	Herb	Amriso/ Amriso	Leaves, root, inflorescence	Body pain, making broom, in fever
59. <i>Zea mays</i>	Herb	Makai/ Makai	Roots, young shoots, fruits	Curing urinary problems, nausea, vomiting, seeds used as MANTRA
60. <i>Crysopogon aciculatus</i>	Herb	Kuro/ Chorkanti	Whole plant	Making broom
Family: Lamiaceae				
61. <i>Leucas indica</i>	Herb	Dulfe jhar/ Dulfi	Plant leaves	Nervous diseases, toothache, as laxative to cattle
62. <i>Mentha arvensis</i>	Herb	Satya jiwani/ Pudina	Leaves	Rheumatism, indigestion, cough
63. <i>Ocimum basilium</i>	Herb	Babari/ Fanas phool	Leaves, seeds	Ear ache, ring worm, constipation, insect repellent, flowers used to worship the God
64. <i>Ocimum sanctum</i>	Herb	Tulasi/ Tulasi	Roots, stems, leaves	Ring worm, as MANTRA, skin diseases, cough, inflammation of mucous membrane, malaria fever
Family: Liliaceae				
65. <i>Allium cepa</i>	Herb	Piyaj/ Piyouj	Scaly leaves	Controlling insulin of diabetic patient, tumor and disease of spleen
66. <i>Allium sativum</i>	Herb	Lahsun/ Lasun	Whole plant	As tonic, stomach problem, curing dysentery, rheumatism, half headache
67. <i>Aloe vera</i>	Herb	Ghiu kumari/ Ghi kumari	Fleshy leaves	Curing burn, checking falling hair, diabetic, urine trouble, menstrual flow, checking tumor growth, asthma, leprosy, killing worms, spleen enlargement, facial cream
Family: Linaceae				
68. <i>Linum usitatissimum</i>	Herb	Aalash/ Aalash	Seeds	Cough, cold, bronchial infection,

				gonorrhoea, diarrhea	
Family: Loganiaceae					
69.	<i>Strychnos nux vomica</i>	Tree	Kuchila/Koichla	Seeds	Killing mad dog, stomach pain
Family: Lythraceae					
70.	<i>Lawsonia innermis</i>	Shrub	Mehandi/Mehadi	Leaves, roots	Curing fresh cut, as cosmetic, jaundice, asthma, cough, piles, syphilis, tenesmus
Family: Malvaceae					
71.	<i>Sida acuta</i>	Shrub	Balujhar/Kharra	Stems, leaves	Making broom, swelling, remedy for sting of wasp & other insects
72.	<i>Urena lobata</i>	Shrub	Nalkuro/Khagraha	Stem fiber, leaves, fruits	Making rope, leaf juice for skin infection, eczema, diarrhea
73.	<i>Abelmoschus esculentus</i>	Herb	Bhindi/Ramjhingani	Roots, seeds	Inflamed mucus membrane, infectious diseases, genital problems, pneumonia, bronchitis, heart diseases
74.	<i>Gossypium hirsutum</i>	Shrub	Kapas/Ruwa	Bark, cotton, roots	Stopping hemorrhage, tongue & gum infection, fever
75.	<i>Hibiscus cannabunus</i>	Shrub	Pat/Patuwa	Leaves, seeds	Dysentery, as tonic to the stomach
76.	<i>Hibiscusrosa sinensis</i>	Shrub	Ghanti phool/Ghanti phool	Leaves, roots	Cold, cough, emollient, aperients
77.	<i>Hibiscus sabdariffa</i>	Shrub	Belchana/Belchana	Leaves, fruits	Wound
Family: Meliaceae					
78.	<i>Azadirachta indica</i>	Tree	Neem/Neem	Barks, leaves, branches	Cough, skin diseases, ulcer, inflammation, leprosy, antidiabetic, antibacterial, antiviral, tooth problems, insect repellent
79.	<i>Melia azedarach</i>	Tree	Bakeno/ Bakain	Leaves, small branches	Protecting from insect attack, as tooth brush
Family: Moraceae					
80.	<i>Artocarpus heterophyllus</i>	Tree	Rukh-katahar/ Kathar	Fruits, leaves, twigs, latex	Fruits edible, vegetable, curing toothache, latex to trap house flies
81.	<i>Artocarpus lakoocha</i>	Tree	Badahar/ Badahar	Leaves, bark, latex	Applying on cracks, stomach problem, treating boils
82.	<i>Ficus bengalensis</i>	Tree	Bar/ Bar	Root, bark, leave, latex	Skin irritation, dysentery, tooth ache, piles, diabetes, diarrhea
83.	<i>Ficus elastica</i>	Tree	Rabar/ Rabar	Bark, latex	Parasitic worm, checking bleeding
84.	<i>Ficus hispida</i>	Shrub	Khasreto/ Khokas	Barks, leaves, fruits	Eating fruits, fodder, ear ache, making Morcha
85.	<i>Ficus resemosa</i>	Tree	Dumri/ Dumair	Leaves, latex	Curing tonsillitis
86.	<i>Ficus religiosa</i>	Tree	Pipal/ Pipar	Barks, leaves, fruits	Cattle's rheumatism, expelling stomach worms, fruits laxative, leaves purgative, tooth ache
87.	<i>Morus australis</i>	Shrub	Kimbu/ Tuit	Leaves, fruits	Throat problems, dyspepsia, fruits as cooling, laxative
Family: Moringaceae					
88.	<i>Moringa oleifera</i>	Tree	Sajiwan/ Munga	Roots, leaves, fruits, gums	Blood pressure, as flies repellent, dysentery, ear ache
Family: Musaceae					
89.	<i>Musa paradisiaca</i>	Herb	Kola/ Kera	Whole plants, leaves, fruits	Diabetes, asthma, cough, cholera, leaves as plates in BHOJ, plants decorating the gate in ceremony



Family: Myricaceae				
90. <i>Myrica esculanta</i>	Tree	Kafal/ Kafal	Bark	Asthma, cough, cholera
Family: Myrtaceae				
91. <i>Psidium guava</i>	Tree	Ambak/ Bilouk	Barks, leaves, fruits, seeds	Common cold, ulcer, as digestive
92. <i>Syzygium cumini</i>	Tree	Jamun/ Jaum	Barks, fruits, seeds	Dysentery, diabetes, as digestive
Family: Oleaceae				
93. <i>Nyctanthes abotritis</i>	Tree	Parijat/ Parijat	Leaves, flower	Fever, as blood purifier, worshipping God
Family: Palmae				
94. <i>Areca catechu</i>	Herb	Supari/ Supari	Fruits, seeds	Expelling tape worm, urinary disorders, facial cream, Kulpuja, Seeds used for invitation
95. <i>Cocas nucifera</i>	Tree	Nariwal/ Nariyal	Fruits	Blood purify, check vomiting, check wrinkle, urinary problems, as diuretic properties, as Nariyal-Chahara by groom
Family: Pedaliaceae				
96. <i>Sesamum indicum</i>	Herb	Til/ Til	Stems, seeds	Puja, making 'Tilkhicharibhat', making 'Laddu' in Maghi
Family: Pinaceae				
97. <i>Pinus roxborghi</i>	Tree	Salla/ Dhup	Woods, resin	Gonorrhea, in snake bite, as stimulant, diaphoretic
Family: Piperaceae				
98. <i>Piper betle</i>	Herb	Pan/ Pan	Leaves	Marriage ceremony, carminative, stimulant, snake bite, worship God
Family: Pontederiaceae				
99. <i>Echhornia crassipes</i>	Herb	Jalkumbhi/ Jalkumhi	Flower	Skin swelling
Family: Punicaceae				
100. <i>Punica granatum</i>	Shrub	Anar/ Darim	Bark, stem, leaf, fruit	Dysentery, cancer, heart disease, high blood pressure
Family: Ramnaceae				
101. <i>Zizipus mauritiana</i>	Shrub	Bayer/ Bayer	Leaf, stem, fruit, stem	Urin problem
Family: Rosaceae				
102. <i>Prunus persica</i>	Shrub	Aaru/ Satalo	Leaf, fruit	Flies repelled from wound
103. <i>Rosa alba</i>	Shrub	Gulab/ Gulab phool	Flower	Charming face, heart disease, laxative
Family: Rubiceae				
104. <i>Anthocephalus chinensis</i>	Tree	Kadam/ Kadam	Stem, leaf, fruit	Pickle
Family: Rutaceae				
105. <i>Aegle marmelos</i>	Tree	Bel/ Bel	Stem, leaf, fruit pulp	Diarrhoea, dysentery, wound
106. <i>Citrous limon</i>	Shrub	Kagati/ Kagti	Fruit	scurvy, removing dandruff, reducing fat from body
Family: Solanaceae				
107. <i>Physalis peruviana</i>	Herb	Bhutka/ Bhutka	Leaves, fruits, roots	Jaundice, bowel complaints
108. <i>Solanum nigrum</i>	Herb	Bhutka, Kaligedi/ Bhutka	Shoots, leaves, fruits	Headache, as vegetable, ring worm

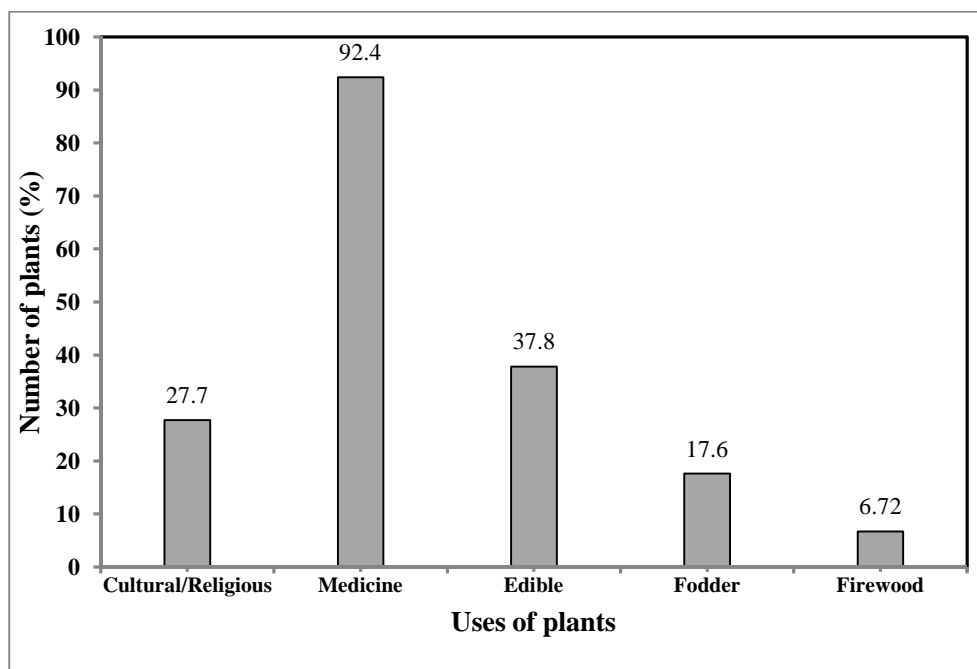
109. <i>Solanum tuberosum</i>	Herb	Aalu/ Alhu	Tubers, shoots	Burns
110. <i>Capsicum annum</i>	Herb	Khorsani/ Marchain	Fruit	Stimulate appetite, gargaling
111. <i>Datura repens</i>	Herb	Dhaturo/ Jhuthur	Fruit, seed	Reumatism, asthma, cattle suffering from diarrhea
112. <i>Nicotiana tabacum</i>	Herb	Surti/Khaini/ Khaini	Leaf	Removing lice from head, ear-ache
Family: Urticaceae				
113. <i>Urtica dioica</i>	Herb	Sisnu/ Sisnu	Leaves, shoots	Increasing lactation, checking excessive menstrual flow
Family: Verbenaceae				
114. <i>Clerodendron viscosum</i>	Shrub	Bhate/ Bhait	Roots, leaves, flowers	Fever, diarrhea, killing worms in stomach
115. <i>Duranta repens</i>	Shrub	Neelkanda/ Neelkand	Whole plant, fruits	Killing mosquito larva
116. <i>Lantana camara</i>	Shrub	Banmara/ Ganki	Whole plants, twigs, leaves	Fresh cut, as tooth brush
117. <i>Vitex negundo</i>	Shrub	Simali/ Sinwair	Leaves	Stomach troubles, as bedbug repellent
Family: Zingiberaceae				
118. <i>Curcuma longa</i>	Herb	Besar/ Hardi	Rhizomes	Checking bleeding, bronchitis, diarrhea, fever, flies repellent, common cold, anthelmintic
119. <i>Zingiber officinale</i>	Herb	Aduwa/ Aadi	Rhizomes	Carminative, cough, dyspepsia, colic, increasing mother's milk

Most of the recorded plants are wild and few of them are cultivated. Out of 119 plants, herbs are maximum (49.57%) followed by shrubs (28.57%) and the least are trees (21.84%). The largest plant family used by Tharu community in Pakali is fabaceae which includes more than 23% plants. It is followed by moraceae, gramineae, malvaceae and so on. Similarly, the largest genera they used is *Ficus* which includes 5.4%. Other large genera are *Ipomea*, *Hibiscus*, *Amaranthus*, *Brassica* and so on (Table 2).

**Table 2.** Ten largest families and genera of plants used by Tharu people of Pakali.

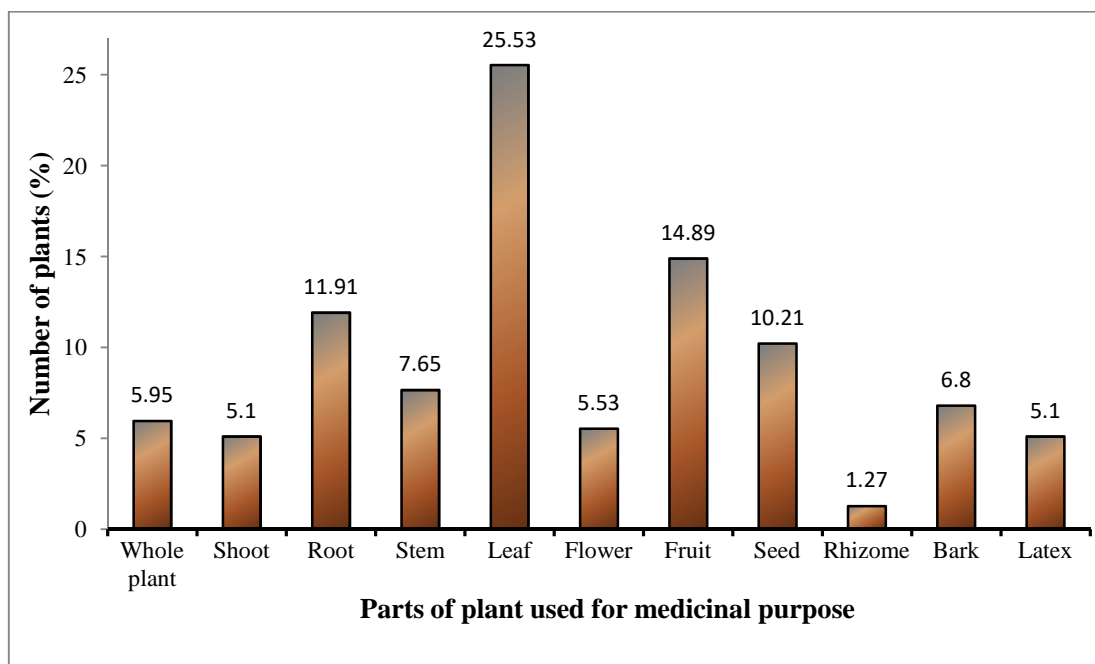
Ten largest families			Ten largest genera		
SN	Families	Plant %	SN	Genera	Plant %
1	Fabaceae	23.07	1	Ficus	5.43
2	Moraceae	15.38	2	Ipomea	3.26
3	Gramineae	15.38	3	Hibiscus	3.26
4	Malvaceae	13.46	4	Amaranthus	2.17
5	Amaranthaceae	11.53	5	Brassica	2.17
6	Solanaceae	11.53	6	Acacia	2.17
7	Asteraceae	9.61	7	Saccharum	2.17
8	Lamiaceae	7.61	8	Ocimum	2.17
9	Verbenaceae	7.61	9	Artocarpus	2.17
10	Brassicaceae	5.76	10	Allium	2.17

It is found that most of the studied plants are used for medicinal purpose (92.4%) which is followed by edible purpose (37.8%), cultural or religious ceremonies (27.7%), fodder (17.6%) and firewood (6.72%) (Fig. 2).



**Figure 2.** Plants used by Tharu community of Pakali for different purposes.

Among the medicinal plants, only 5.95% plants are used as whole plant for medicinal purposes. Among the plant parts, the leaf of maximum plants (25.53%) is used for medicine, followed by fruit, root, seed and so on (Fig. 3).



**Figure 3.** Different parts of the plants used as medicine by Tharu community of Pakali.

A large number of plants are found to be using by Tharu of Pakali in the treatment of more than 60 human diseases. Maximum plants (17.74) are used for stomach problem and then expelling worm, skin disease, diarrhea, dysentery and cough, rheumatism, fever and eye problem and so on (Table 3).

**Table 3.** Plants used for different diseases by Tharu people of Pakali.

SN	Diseases	Plant %	SN	Diseases	Plant %
1	Stomach problem	17.74	34	Gonorrhea	2.25
2	Expelling worm	14.28	35	Dyspepsia	2.25
3	Itching	14.28	36	Appetizer	2.25
4	Diarrhoea	12.6	37	Eczema	1.68
5	Dysentery	12.6	38	Colic	1.68
6	Cough	12.6	39	Nervous problem	1.68
7	Rheumatism	9.24	40	Tumour	1.68
8	Fever	9.24	41	Head ache	1.68
9	Eye problem	9.24	42	Chest pain	1.68
10	Swelling	7.56	43	Liver pain	1.68
11	Diabetes	7.56	44	Insect bite	1.68
12	Urinary problem	7.56	45	Cancer	1.68
13	Cut/wound	6.72	46	Kidney problem	1.68
14	Asthma	5.88	47	Spleen	1.68
15	Pneumonia	5.88	48	Cholera	1.68
16	Jaundice	5.04	49	Malaria	1.68
17	Pile	5.04	50	Anemia	0.84
18	Insect repeller	5.04	51	Titanus	0.84
19	Bleeding	5.04	52	Sinusitis	0.84
20	Bronchitis	4.2	53	Scorpion sting	0.84
21	Snake bite	4.2	54	Elephantiasis	0.84
22	Menstruation problem	4.2	55	Influenza	0.84
23	Boil	4.2	56	Backbone pain	0.84
24	Throat problem	4.2	57	Leucoderma	0.84
25	Tooth problem	4.2	58	Mellitus	0.84
26	Vomiting	3.36	59	Aphrodisiac	0.84
27	Blood purifier	3.36	60	Body pain	0.84
28	High blood pressure	3.36	61	Ear ache	0.84
29	Heart disease	3.36	62	Syphilis	0.84
30	Leprosy	3.36	63	Tenesmus	0.84
31	Ulcer	3.36	64	Genital problem	0.84
32	Tooth problem	3.36	65	Diaphoretic	0.84
33	Abortion	2.25			

There are however few plants as well which are found effective in the treatment of ailments like for abortion, gonorrhoea, dyspepsia, appetizer, eczema, tumour, head ache, chest pain, cancer, kidney problem, cholera etc.

The indigenous knowledge on medicinal plants is gaining recognition worldwide because of its support in discovery of new medicines and its importance for proper conservation of biodiversity. It has been clear from the study that the Tharus of Pakali have good

knowledge about the use of traditional medicine and other uses of plants. Important medicinal plants viz., *Abelmoschus esculentus*, *Abrus precatorius*, *Alstonia scholaris*, and *Strychnos nux vomika* described here were not reported in Tharu community before. Among them *Abrus precatorius* irrespective with its popularity, still await proper documentation.

A considerable variation in the utilization of plants for specific purposes was found in the several regions during the comprehensive field work. The plants which has no ethno botanical uses in one region, was found to possess immense affect as medicine in another region. The use of plant parts and mode of administration was found different accordingly. As for example, leaf juice of *Fcus hispida* was found to be used in cut and wound while in Terai region its leaf is used to treat ear ache. On the other hand, despite the regional variation, some plants are found to possess similar uses as in the case of *Allium cepa*, *Allium sativum*, *Aloe vera*, *Zingiber officinale*, *Citrus lemon*, *Rauvolfia serpentina* etc. The methods of preparations were found variable. Some plants were administered by mixing with oil, curd, milk, honey etc. Still some plants were mixed with other plant parts prior to administration.

Indeed, traditional medicinal practice is perplexing because some poisonous plants have also been utilizing as medicine. If dose and mode of administration are altered, it will be dangerous. For example, low dose is prescribed for abortion, but over dose is poisonous. Several tribal communities with their own ritual, cultural, religious and social feathers are dominant throughout the nation. They have broad empirical knowledge of use of medicinal plants. Indeed, they are the true explorers of ethno botanically important plants. People could gain knowledge from such communities and develop industries to produce modern medicines.

Some important plants are disappearing in this area due to overexploitation. This may affect the traditional medicinal practices in the future generations. Easy access to modern medicines and less recognition of traditional healers are the main causes leading to decrease in interest of young generation in the use of traditional medicinal practices. Therefore, awareness for conservation and wise use management of medicinal plants is essential.

### Acknowledgements

Authors are thankful to the Chairman, Department of Botany, P.G. Campus, Tribhuvan University, Biratnagar for laboratory facilities. Thanks also due to all the informants of Pakali for their kind help and cooperation during data collection and field trips.

### References

- Acharya, R. & K.P. Acharya 2009. Ethnobotanical study of medicinal plants used by Tharu community of Parroha VDC, Rupandehi District, Nepal. *Scientific World* **7(7)**: 80-84. DOI: 10.3126/sw.v7i7.3832
- Aryal, S.P. 2009. *Ethnobotany of Tharu: Incorporation of culture and biodiversity conservation* (A case study of Jayanagar VDC of Kapilvastu District). M.A. Thesis, Central Department of Rural Development, T.U.
- CBS 2012. *Statistical book of Nepal 2012*. Central Bureau of Statistics HMG. Nepal, National Plannig Commission Secretariat, Kathmandu, Nepal.

- Chapagain, D.J., S.D. Joshi & S.R. Jnawali 2004. Use of medicinal plants by tharu community in the southwestern buffer zone of Royal Bardia National Park. *Scientific World* **2(2)**: 50-62.
- Chaudhary, D.K. 2010. *Ethnobotanical plants of Tharu of Sunsari District, Nepal*. M.Sc. Thesis, Department of Botany, P.G. Campus, T.U., Biratnagar, Nepal.
- Choudhary, R. 2000. *Ethnobotanical studies of Tharu Community of Bhadgaun Sinuwari VDC of Sunsari District, Nepal*. M.Sc. Thesis, Department of Botany, P.G. Campus, T.U., Biratnagar, Nepal.
- Dangol, D.R. & S.B. Gurung 1991. Ethnobotany of the Tharu tribe of Chitwan District, Nepal. *Int. J. Pharmacognosy* **29(3)**: 203-209. DOI: 10.3109/13880209109082879
- Department of Medicinal Plant 1970. *Medicinal plants of Nepal*. Bulletin of the Department of Medicinal Plants, No. 3.
- Hara, H. & L.H.J. William 1979. *An enumeration of flowering plants of Nepal*, vol. 2. British Museum (Natural History) London.
- Hara, H., A.O. Chater & L.H.J. William 1982. *An enumeration of the flowering plants of Nepal*, vol. 3. British Museum (Natural History) London.
- Hara, H., W.T. Stearn & L.H.J. William 1978. *An enumeration of the flowering plants of Nepal*, vol. 1. British Museum (Natural History) London.
- Hooker, J.D. 1872-1897. *The flora of British India*, vols. 1-7. Reeve L, London.
- Manandhar, N.P. 1985. Ethnobotanical notes on certain medicinal plants used by Tharu of Dang Deukhuri District, Nepal. *Int. J. Crude Drug Res.* **23(4)**: 153-159.
- Shrestha, K. & N. Kase 1997. Taxonomy and ethnobotany of *Luffa graveolens* Roxb. in Rana Tharu village of Kanchanpur District. *J. Nat. Hist. Mus.* **16**: 62-70.
- Shrestha, S.K. 2002. *Ethnobotanical studies of Tharu community of Tankisinuwari VDC of Morang District*. M.Sc. Thesis, Department of Botany, P.G. Campus, T.U., Biratnagar, Nepal.
- Singh, A.G., A. Kumar & D.D. Tewari 2012. An ethnobotanical survey of medicinal plants used in Terai forest of western Nepal. *Journal of Ethnobiology and Ethnomedicine* **8**: 19. DOI: 10.1186/1746-4269-8-19
- Siwakoti, M. & S.K. Verma 1996. Medicinal plants of the Terai of Eastern Nepal. *J. Econ. Tax. Bot. Additional Series* **12**: 423-438.