Ethnobotany of Tharu community of Pakali, Sunsari, Nepal

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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, gonorrhea, 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 ethnobotany has been a subject of interest in recent year.

The world ‘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 ‘Tharuhat’. 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, Sindhu 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 Bhojpuri 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 (Meghauli, 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, Hansposa 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 (Sasastra 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)](image-url)
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>
<thead>
<tr>
<th>Scientific name</th>
<th>Habit Nepali /Tharu name</th>
<th>Parts used</th>
<th>Ailments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family: Acanthaceae</td>
<td>Adhaotoda zeylanica</td>
<td>Shrub Asuro/Bakas</td>
<td>Leaves, roots, flowers</td>
</tr>
<tr>
<td>Family: Alismataceae</td>
<td>Sagittaria sagittifolia</td>
<td>Herb -</td>
<td>Flowers</td>
</tr>
<tr>
<td>Family: Amaranthaceae</td>
<td>Achyranthes aspera</td>
<td>Herb Apamarga/ Utachichri</td>
<td>Roots</td>
</tr>
<tr>
<td>2. Alternanthera sessilis</td>
<td>Viringi-jhar/ Sarhauchi</td>
<td>Roots, whole plant</td>
<td>Stomach pain, diarrhea, dysentery, snake-bite wound, lactation</td>
</tr>
<tr>
<td>3. Amaranthus spinosus</td>
<td>Banlude/ Katrasag</td>
<td>Roots, whole plant</td>
<td>Improving digestion, gonorrhea, eczema, collie</td>
</tr>
<tr>
<td>4. Amaranthus viridis</td>
<td>Lude/ Genhari-sag</td>
<td>Shoots, seeds</td>
<td>Constipation, diarrhea</td>
</tr>
<tr>
<td>5. Celosia argenta</td>
<td>Siruwale-sag/ Murgaphool</td>
<td>Flowers</td>
<td>Menstrual disorder</td>
</tr>
</tbody>
</table>

**Table 1.** Different plants, their parts and uses by Tharu community of Pakali, Sunsari.
<table>
<thead>
<tr>
<th>No.</th>
<th>Species Name</th>
<th>Family</th>
<th>Part(s)</th>
<th>Medical Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Gomprena globosa</td>
<td>Anacardiaceae</td>
<td>Flowers, Decoration</td>
<td>Mala making</td>
</tr>
<tr>
<td>9</td>
<td>Magnifera indica</td>
<td>Anacardiaceae</td>
<td>Aamp/ Aam</td>
<td>Urinary problems</td>
</tr>
<tr>
<td>10</td>
<td>Semicarpus anacardium</td>
<td>Anacardiaceae</td>
<td>Ranibhalayo/ Bhela, Bhelauri</td>
<td>Asthma, Rheumatism, Cronic Cough, Dyspepsia, Indigestion, Pile, Skin Diseases, Nervous Disability</td>
</tr>
<tr>
<td>11</td>
<td>Annona reticulata</td>
<td>Annonaceae</td>
<td>Sarifa/ Aanta, Roots, Seeds</td>
<td>In Cooling Body, Purgative, Abortion, Menstrual Disorder</td>
</tr>
<tr>
<td>12</td>
<td>Coriandrum sativum</td>
<td>Apiceae</td>
<td>Dhaniya/ Dhaniya, Leaves, Seeds</td>
<td>Correcting Foul Breath, Carminative, Tonic, Appetite</td>
</tr>
<tr>
<td>13</td>
<td>Rauvolfia serpentina</td>
<td>Apocynaceae</td>
<td>Sarpagandha/ Isargaj</td>
<td>Treating Snake Bite, Curing High Blood Pressure, Cardiac Diseases</td>
</tr>
<tr>
<td>14</td>
<td>Alstonia scholaris</td>
<td>Apocynaceae</td>
<td>Chhatiyan/ Chhatiyan</td>
<td>Leprosy, Dysentery, Diarrhoea, Fever, Malaria, Fever, Ulcer, Tumour, Rheumatism, Dysentery, Improving Lactation, Cold Fever, Sinusitis, Headache, Skin Diseases</td>
</tr>
<tr>
<td>15</td>
<td>Acorus calamus</td>
<td>Araceae</td>
<td>Bojo/ Achhaini, Rhizome</td>
<td>Chronic Cough, Fever, Gastric Trouble, Pneumonia, Killing Lice, Bedbug &amp; Insects</td>
</tr>
<tr>
<td>16</td>
<td>Calotropis gigantea</td>
<td>Asclepiadaceae</td>
<td>Aank/ Aak</td>
<td>Joint, Titanus, Swelling, Dysentery, Snake Bite, Scorpion Sting, Earache, Elephantiasis, Abortion</td>
</tr>
<tr>
<td>17</td>
<td>Ecliptaprostrate</td>
<td>Asteraceae</td>
<td>Bhumiraj/ Bhangari</td>
<td>Cutting, Fever, Antiseptic, Ulcer, Wound</td>
</tr>
<tr>
<td>18</td>
<td>Elephantopus scarber</td>
<td>Asteraceae</td>
<td>Sajeevan butti/ Laxmanbutti</td>
<td>Diarrhea, Dysentery, Swelling, Stomach Pain, Arresting Vomit, Rheumatism, Pneumonia, Chest Pain, Expelling Worm, Purifying Blood, Cut or Wound</td>
</tr>
<tr>
<td>19</td>
<td>Guizotia abyssynica</td>
<td>Asteraceae</td>
<td>Sayapati/ Filunge, Filunge</td>
<td>Rheumatism, Pneumonia, Chest Pain, Expelling Worm, Purifying Blood, Cut or Wound</td>
</tr>
<tr>
<td>20</td>
<td>Tagetes erecta</td>
<td>Asteraceae</td>
<td>Sayapatri/ Genaphool</td>
<td>Chronic Cough, Fever, Gastric Trouble, Pneumonia, Killing Lice, Bedbug &amp; Insects</td>
</tr>
<tr>
<td>21</td>
<td>Ageratum conyzoids</td>
<td>Asteraceae</td>
<td>Iliam jhar/ Bokra</td>
<td>Checking Bleeding, Rheumatism</td>
</tr>
<tr>
<td>22</td>
<td>Oroxylum indicum</td>
<td>Bombaceae</td>
<td>Totala/ Patsan</td>
<td>Curing Old Fever</td>
</tr>
<tr>
<td>23</td>
<td>Bombax ceiba</td>
<td>Bombaceae</td>
<td>Simal/ Simar, Barks, Gum, Roots</td>
<td>Checking Bleeding, Dysentery, Influenza, Urinary Infection</td>
</tr>
<tr>
<td>24</td>
<td>Brassica compestris</td>
<td>Brassicaceae</td>
<td>Tori/Tori, Tuberous Roots</td>
<td>Rheumatism, Bronchitis Infection, Ear Pain, Anti-scorbutic, Oil Cake for Bath</td>
</tr>
<tr>
<td>25</td>
<td>Lepidium sativum</td>
<td>Brassicaceae</td>
<td>Chamsur/ Chamsur, Leaves, Seed</td>
<td>Increasing Lactation in Mother, Rheumatism, Liver Pain, Eye Disease, As Appetizer</td>
</tr>
<tr>
<td>26</td>
<td>Brassica juncea</td>
<td>Brassicaceae</td>
<td>Rayosag/ Raisag, Leaves, Seeds</td>
<td>Rheumatism, Bronchitis Infection, Ear Pain, Anti-scorbutic, Oil Cake for Bath</td>
</tr>
</tbody>
</table>

**Note:** The table above lists the species, their family, parts used, and their medical uses. Some of the common diseases treated by these plants include asthma, rheumatism, chronic cough, dyspepsia, indigestion, pile, skin diseases, nervous disability, urinary problems, and more. The list of plants includes species like Gomprena globosa, Magnifera indica, Semicarpus anacardium, and others with their respective uses and family affiliations.
<table>
<thead>
<tr>
<th>No.</th>
<th>Plant Name</th>
<th>Type</th>
<th>Part Used</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>27.</td>
<td>Bryophyllum pinnatum</td>
<td>Herb</td>
<td>Magarmous leaves</td>
<td>Boils, wounds, insects bites, healing wound, dysentery</td>
</tr>
<tr>
<td>28.</td>
<td>Cannabis sativa</td>
<td>Herb</td>
<td>Ganja, Bhang</td>
<td>Abdominal trouble, as narcotic, sedative tonic, antispasmodic, breast cancer</td>
</tr>
<tr>
<td>29.</td>
<td>Carica papaya</td>
<td>Tree</td>
<td>Mewa, Neba</td>
<td>Ringworm, stomach ache, digestion, pile, kidney stone</td>
</tr>
<tr>
<td>30.</td>
<td>Chenopodium album</td>
<td>Herb</td>
<td>Bethe, Bethuwasag</td>
<td>Diabetes, constipation, increasing lactation</td>
</tr>
<tr>
<td>31.</td>
<td>Ipomea aquatica</td>
<td>Herb</td>
<td>Karmikosag, Karmisag</td>
<td>Young shoots, leaves, skin allergy, weakness, nervousness</td>
</tr>
<tr>
<td>32.</td>
<td>Ipomea batatus</td>
<td>Herb</td>
<td>Sakarkanda, Alhuwa</td>
<td>Roots, Carminative, as laxative, diuretic</td>
</tr>
<tr>
<td>33.</td>
<td>Ipomea carnea</td>
<td>Shrub</td>
<td>Karmijhar</td>
<td>Curing back bone pain</td>
</tr>
<tr>
<td>34.</td>
<td>Mimordica charantia</td>
<td>Herb</td>
<td>Titekarela, Karela, Kareli</td>
<td>Fruits, Lowering B.P., curing pile</td>
</tr>
<tr>
<td>35.</td>
<td>Cuscuta reflexa</td>
<td>Herb</td>
<td>Akasbeli, Amralati</td>
<td>Itching, scabies, jaundice</td>
</tr>
<tr>
<td>36.</td>
<td>Cyperus difermiss</td>
<td>Herb</td>
<td>Pater, Pater</td>
<td>Weaving mats</td>
</tr>
<tr>
<td>37.</td>
<td>Shorea robusta</td>
<td>Tree</td>
<td>Sal, Sakhuwa</td>
<td>Diarrhea, skin diseases, ear ache, swollen parts of body, as antiseptic</td>
</tr>
<tr>
<td>38.</td>
<td>Euphorbia pulcherrima</td>
<td>Shrub</td>
<td>Lalupate</td>
<td>Skin diseases, as ornamental plants</td>
</tr>
<tr>
<td>39.</td>
<td>Jatropha curcas</td>
<td>Shrub</td>
<td>Datiwan, Banhandi</td>
<td>Swelling gum &amp; testes, skin diseases, seeds purgative, tooth brushing</td>
</tr>
<tr>
<td>40.</td>
<td>Ricinus communis</td>
<td>Tree</td>
<td>Aadi, Andir</td>
<td>Dryness of skin, cracking heels, swelling, jaundice, using in sericulture, oil as lubricant</td>
</tr>
<tr>
<td>41.</td>
<td>Abrus precatorius</td>
<td>Herb</td>
<td>Lalgedi, Kajarnee</td>
<td>Cleaning eye, as ornamental plant, cough, cold, colic pain</td>
</tr>
<tr>
<td>42.</td>
<td>Acacia catechu</td>
<td>Tree</td>
<td>Khayet, Kher</td>
<td>Throat congestion, indigestion, anemia, leucodema, piles, urinary &amp; vaginal discharge, as dyes</td>
</tr>
<tr>
<td>43.</td>
<td>Acacia nilotica</td>
<td>Tree</td>
<td>Baul, Babur</td>
<td>Skin infection, destroying bed bug, diabetes, mellitus, shore throats, as tonic</td>
</tr>
<tr>
<td>44.</td>
<td>Albizia labbek</td>
<td>Tree</td>
<td>Siris, Siris</td>
<td>Dysentery, diarrhea, stomach problem</td>
</tr>
<tr>
<td>45.</td>
<td>Bauhiniya purpurea</td>
<td>Tree</td>
<td>Tanki, Mouhali</td>
<td>Stomach problem, fodder, as laxative</td>
</tr>
<tr>
<td>46.</td>
<td>Cassia fistula</td>
<td>Tree</td>
<td>Rajbriksha, Banlauri</td>
<td>Inflammation, chest &amp; liver complaint, skin diseases, leprosy, burning, as purgative, tonic</td>
</tr>
<tr>
<td>No.</td>
<td>Name</td>
<td>Family</td>
<td>Type</td>
<td>Usage</td>
</tr>
<tr>
<td>-----</td>
<td>-------------------------------</td>
<td>--------</td>
<td>------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>47.</td>
<td><em>Lathyrus sphaericus</em></td>
<td></td>
<td>Leaf</td>
<td>In making ‘BIRIYA’ for future consumption</td>
</tr>
<tr>
<td>48.</td>
<td><em>Mimosa pudica</em></td>
<td></td>
<td>Plant</td>
<td>Pneumonia &amp; swollen body part</td>
</tr>
<tr>
<td>49.</td>
<td><em>Saraca asoca</em></td>
<td></td>
<td>Leaf</td>
<td>Menstrual disorder, diabetes, worshipping, as ornamental</td>
</tr>
<tr>
<td>50.</td>
<td><em>Tamarindus indica</em></td>
<td></td>
<td>Fruit</td>
<td>Cough, diarrhea, dysentery, digestive, carminative, laxative</td>
</tr>
<tr>
<td>51.</td>
<td><em>Vigna mungo</em></td>
<td></td>
<td>Seed</td>
<td>Rheumatism</td>
</tr>
<tr>
<td>52.</td>
<td><em>Cajanus cajan</em></td>
<td></td>
<td>Leaf</td>
<td>Expelling worms, kidney stone, curing skin crack face</td>
</tr>
<tr>
<td>53.</td>
<td><em>Bambusa nutans</em></td>
<td>Gramineae</td>
<td>Whole plant</td>
<td>Curing urinary problem in child</td>
</tr>
<tr>
<td>54.</td>
<td><em>Cynodon dactylon</em></td>
<td></td>
<td>Aerial parts</td>
<td>Poor sightness, pneumonia, healing wound &amp; burn, as MANTRA, removing foreign particle from eye</td>
</tr>
<tr>
<td>55.</td>
<td><em>Imperata cylindrica</em></td>
<td></td>
<td>Root</td>
<td>Pneumonia, as anthelmintic &amp; galactogogue, as MANTRA, making garland for wedding</td>
</tr>
<tr>
<td>56.</td>
<td><em>Saccharum officinarum</em></td>
<td></td>
<td>Stem</td>
<td>Jaundice, aphrodisiac, as sweet laxative, as cooling</td>
</tr>
<tr>
<td>57.</td>
<td><em>Saccharum spontaneum</em></td>
<td></td>
<td>Flower</td>
<td>Check bleeding, as coolant</td>
</tr>
<tr>
<td>58.</td>
<td><em>Thysanolaena maxima</em></td>
<td></td>
<td>Inflorescence</td>
<td>Body pain, making broom, in fever</td>
</tr>
<tr>
<td>59.</td>
<td><em>Zea mays</em></td>
<td></td>
<td>Root</td>
<td>Curing urinary problems, nausea, vomiting, seeds used as MANTRA</td>
</tr>
<tr>
<td>60.</td>
<td><em>Crysopogon aciculatus</em></td>
<td></td>
<td>Plant</td>
<td>Making broom</td>
</tr>
<tr>
<td>61.</td>
<td><em>Leucas indica</em></td>
<td>Lamiaceae</td>
<td>Leaf</td>
<td>Nervous diseases, toothache, as laxative to cattle</td>
</tr>
<tr>
<td>62.</td>
<td><em>Mentha arvensis</em></td>
<td></td>
<td>Leaf</td>
<td>Rheumatism, indigestion, cough</td>
</tr>
<tr>
<td>63.</td>
<td><em>Ocimum basilium</em></td>
<td></td>
<td>Leaf</td>
<td>Ear ache, ring worm, constipation, insect repellent, flowers used to worship the God</td>
</tr>
<tr>
<td>64.</td>
<td><em>Ocimum sanctum</em></td>
<td></td>
<td>Root</td>
<td>Ring worm, as MANTRA, skin diseases, cough, inflammation of mucous membrane, malaria fever</td>
</tr>
<tr>
<td>65.</td>
<td><em>Allium cepa</em></td>
<td>Liliaceae</td>
<td>Leaf</td>
<td>Controlling insulin of diabetic patient, tumor and disease of spleen</td>
</tr>
<tr>
<td>66.</td>
<td><em>Allium sativum</em></td>
<td></td>
<td>Plant</td>
<td>As tonic, stomach problem, curing dysentery, rheumatism, half headache</td>
</tr>
<tr>
<td>67.</td>
<td><em>Aloe vera</em></td>
<td></td>
<td>Leaf</td>
<td>Curing burn, checking falling hair, diabetic, urine trouble, menstrual flow, checking tumor growth, asthma, leprosy, killing worms, spleen enlargement, facial cream</td>
</tr>
<tr>
<td>68.</td>
<td><em>Linum usitatissimum</em></td>
<td>Linaceae</td>
<td>Seed</td>
<td>Cough, cold, bronchial infection.</td>
</tr>
</tbody>
</table>
| Family: Loganiaceae | 69. Strychnos nux vomica | Tree | Kuchila/Koichla | Seeds | Curing fresh cut, as cosmetic, jaundice, asthma, cough, piles, syphilis, tenesmus.
| | | | | Killing mad dog, stomach pain. |
| Family: Lythraceae | 70. Lawsonia inermis | Shrub | Mehandi/Mehadi | Leaves, roots | Making broom, swelling, remedy for sting of wasp & other insects.
| | | | | Making rope, leaf juice for skin infection, eczema, diarrhea. |
| | 72. Urena labata | Shrub | Nalkuro/Khagrraha | Stem fiber, leaves, fruits | Diarrhea.
| | 73. Abelmoschus esculentus | Herb | Bhindi/Ramjhingani | Roots, seeds | Curing fresh cut, as cosmetic, jaundice, asthma, cough, piles, syphilis, tenesmus. |
| Family: Malvaceae | 74. Gossypium hirsutum | Shrub | Kapas/Ruwa | Bark, cotton, roots | Stopping hemorrhage, tongue & gum infection, fever.
| | 75. Hibiscus cannabinus | Shrub | Pat/Patuwa | Leaves, seeds | Dysentery, as tonic to the stomach.
| | 76. Hibiscus rosa-sinensis | Shrub | Ghanti phool/Ghanti phool | Leaves, roots | Cold, cough, emollient, aperients. |
| | 77. Hibiscus sabdariffa | Shrub | Belchana/Belchana | Leaves, fruits | Wound. |
| Family: Meliaceae | 78. Azadirachta indica | Tree | Neem/Neem | Barks, leaves, branches | Cough, skin diseases, ulcer, inflammation, leprosy, antidiabetic, antibacterial, antiviral, tooth problems, insect repellent.
| | 79. Melia azedarach | Tree | Bakeno/ Bakain | Leaves, small branches | Protecting from insect attack, as tooth brush. |
| | 81. Artocarpus lakoocha | Tree | Badahar/ Badahar | Leaves, bark, latex | Applying on cracks, stomach problem, treating boils.
| | 82. Ficus bengalensis | Tree | Bar/ Bar | Root, bark, leave, latex | Skin irritation, dysentery, tooth ache, piles, diabetes, diarrhea.
| | 83. Ficus elastica | Tree | Rabar/ Rabar | Barks, leaves, latex | Parasitic worm, checking bleeding.
| | 84. Ficus hispida | Shrub | Khasreto/ Khokas | Leaves, latex | Eating fruits, fodder, ear ache, making Morcha.
| | 85. Ficus resemosa | Tree | Dumri/ Dumair | Leaves, latex | Curing tonsillitis.
| | 86. Ficus religiosa | Tree | Pipl/ Pipar | Barks, leaves, fruits | Cattle’s rheumatism, expelling stomach worms, fruits laxative, leaves purgative, tooth ache.
| | 87. Morus australis | Shrub | Kimbu/ Tuit | Leaves, fruits | Throat problems, dyspepsia, fruits as cooling, laxative.
| Family: Moringaceae | 88. Moringa oleifera | Tree | Sajiwan/ Munga | Roots, leaves, fruits, gums | Blood pressure, as flies repellent, dysentery, ear ache.
| Family: Musaceae | 89. Musa paradisiaca | Herb | Kola/ Kera | Whole plants, leaves, fruits | Diabetes, asthma, cough, cholera.
<p>| | | | | leaves as plates in BHOI, plants decorating the gate in ceremony. |</p>
<table>
<thead>
<tr>
<th>Family: Myricaceae</th>
<th>90. <em>Myrica esculanta</em></th>
<th>Tree</th>
<th>Kafal/ Kafal</th>
<th>Bark</th>
<th>Asthma, cough, cholera</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family: Myrtaceae</td>
<td>91. <em>Psidium guava</em></td>
<td>Tree</td>
<td>Ambak/ Bilouk</td>
<td>Barks, leaves, fruits, seeds</td>
<td>Common cold, ulcer, as digestive</td>
</tr>
<tr>
<td></td>
<td>92. <em>Syzygium cumini</em></td>
<td>Tree</td>
<td>Jamun/ Jaum</td>
<td>Barks, fruits, seeds</td>
<td>Dysentery, diabetes, as digestive</td>
</tr>
<tr>
<td>Family: Oleaceae</td>
<td>93. <em>Nyctanthes abotritis</em></td>
<td>Tree</td>
<td>Parijat/ Parijat</td>
<td>Leaves, flower</td>
<td>Fever, as blood purifier, worshipping God</td>
</tr>
<tr>
<td>Family: Palmae</td>
<td>94. <em>Areca catechu</em></td>
<td>Herb</td>
<td>Supari/ Supari</td>
<td>Fruits, seeds</td>
<td>Expelling tape worm, urinary disorders, facial cream, Kulpua, Seeds used for invitation</td>
</tr>
<tr>
<td></td>
<td>95. <em>Cocos nucifera</em></td>
<td>Tree</td>
<td>Nariwal/ Nariyal</td>
<td>Fruits</td>
<td>Blood purify, check vomiting, check wrinkle, urinary problems, as diuretic properties, as Nariayal-Chahara by groom</td>
</tr>
<tr>
<td>Family: Pinaceae</td>
<td>97. <em>Pinus roxborghi</em></td>
<td>Tree</td>
<td>Salla/ Dhup</td>
<td>Woods, resin</td>
<td>Gonorrhea, in snake bite, as stimulant, diaphoretic</td>
</tr>
<tr>
<td>Family: Piperaceae</td>
<td>98. <em>Piper betle</em></td>
<td>Herb</td>
<td>Pan/ Pan</td>
<td>Leaves</td>
<td>Marriage ceremony, carminative, stimulant, snake bite, worship God</td>
</tr>
<tr>
<td>Family: Pontederiaceae</td>
<td>99. <em>Echhornia crassipes</em></td>
<td>Herb</td>
<td>Jalkumbhi/ Jalkumhi</td>
<td>Leaves</td>
<td>Skin swelling</td>
</tr>
<tr>
<td>Family: Punicaceae</td>
<td>100. <em>Punica granatum</em></td>
<td>Shrub</td>
<td>Anar/ Darim</td>
<td>Bark, stem, leaf, fruit</td>
<td>Dysentery, cancer, heart disease, high blood pressure</td>
</tr>
<tr>
<td>Family: Ramnaceae</td>
<td>101. <em>Ziziphus mauritiana</em></td>
<td>Shrub</td>
<td>Bayer/ Bayer</td>
<td>Leaf, stem, fruit, stem</td>
<td>Urin problem</td>
</tr>
<tr>
<td>Family: Rosnaceae</td>
<td>102. <em>Prunus persica</em></td>
<td>Shrub</td>
<td>Aaru/ Satalo</td>
<td>Leaf, fruit</td>
<td>Flies repelled from wound</td>
</tr>
<tr>
<td></td>
<td>103. <em>Rosa alba</em></td>
<td>Shrub</td>
<td>Gulab/ Gulabi phool</td>
<td>Leaf, fruit</td>
<td>Charming face, heart disease, laxative</td>
</tr>
<tr>
<td>Family: Rubiceae</td>
<td>104. <em>Anthocephalus chinensis</em></td>
<td>Tree</td>
<td>Kadam/ Kadam</td>
<td>Stem, leaf, fruit</td>
<td>Pickle</td>
</tr>
<tr>
<td>Family: Rutaceae</td>
<td>105. <em>Aegle marmelos</em></td>
<td>Tree</td>
<td>Bel/ Bel</td>
<td>Stem, leaf, fruit pulp</td>
<td>Diarrhoea, dysentery, wound</td>
</tr>
<tr>
<td></td>
<td>106. <em>Citrus limon</em></td>
<td>Shrub</td>
<td>Kagati/ Kagi</td>
<td>Fruit</td>
<td>Scurvy, removing dandruff, reducing fat from body</td>
</tr>
<tr>
<td>Family: Solanaceae</td>
<td>107. <em>Physalis peruviana</em></td>
<td>Herb</td>
<td>Bhutka/ Bhutka</td>
<td>Leaves, fruits, roots</td>
<td>Jaundice, bowel complaints</td>
</tr>
<tr>
<td></td>
<td>108. <em>Solanum nigrum</em></td>
<td>Herb</td>
<td>Bhutka, Kaligedi/ Bhutka</td>
<td>Shoots, leaves, Headache, as vegetable, ring worm fruits</td>
<td></td>
</tr>
</tbody>
</table>
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.**

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

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

Figure 3. Different parts of the plants used as medicine by Tharu community of Pakali.
A large number of plants are found to be used 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.

<table>
<thead>
<tr>
<th>SN</th>
<th>Diseases</th>
<th>Plant %</th>
<th>SN</th>
<th>Diseases</th>
<th>Plant %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Stomach problem</td>
<td>17.74</td>
<td>34</td>
<td>Gonorrhea</td>
<td>2.25</td>
</tr>
<tr>
<td>2</td>
<td>Expelling worm</td>
<td>14.28</td>
<td>35</td>
<td>Dyspepsia</td>
<td>2.25</td>
</tr>
<tr>
<td>3</td>
<td>Itching</td>
<td>14.28</td>
<td>36</td>
<td>Appetizer</td>
<td>2.25</td>
</tr>
<tr>
<td>4</td>
<td>Diarrhoea</td>
<td>12.6</td>
<td>37</td>
<td>Eczema</td>
<td>1.68</td>
</tr>
<tr>
<td>5</td>
<td>Dysentry</td>
<td>12.6</td>
<td>38</td>
<td>Collic</td>
<td>1.68</td>
</tr>
<tr>
<td>6</td>
<td>Cough</td>
<td>12.6</td>
<td>39</td>
<td>Nervous problem</td>
<td>1.68</td>
</tr>
<tr>
<td>7</td>
<td>Rheumatism</td>
<td>9.24</td>
<td>40</td>
<td>Tumour</td>
<td>1.68</td>
</tr>
<tr>
<td>8</td>
<td>Fever</td>
<td>9.24</td>
<td>41</td>
<td>Head ache</td>
<td>1.68</td>
</tr>
<tr>
<td>9</td>
<td>Eye problem</td>
<td>9.24</td>
<td>42</td>
<td>Chest pain</td>
<td>1.68</td>
</tr>
<tr>
<td>10</td>
<td>Swelling</td>
<td>7.56</td>
<td>43</td>
<td>Liver pain</td>
<td>1.68</td>
</tr>
<tr>
<td>11</td>
<td>Diabetes</td>
<td>7.56</td>
<td>44</td>
<td>Insect bite</td>
<td>1.68</td>
</tr>
<tr>
<td>12</td>
<td>Urinary problem</td>
<td>7.56</td>
<td>45</td>
<td>Cancer</td>
<td>1.68</td>
</tr>
<tr>
<td>13</td>
<td>Cut/wound</td>
<td>6.72</td>
<td>46</td>
<td>Kidney problem</td>
<td>1.68</td>
</tr>
<tr>
<td>14</td>
<td>Asthma</td>
<td>5.88</td>
<td>47</td>
<td>Spleen</td>
<td>1.68</td>
</tr>
<tr>
<td>15</td>
<td>Pneumonia</td>
<td>5.88</td>
<td>48</td>
<td>Cholera</td>
<td>1.68</td>
</tr>
<tr>
<td>16</td>
<td>Jaundice</td>
<td>5.04</td>
<td>49</td>
<td>Malaria</td>
<td>1.68</td>
</tr>
<tr>
<td>17</td>
<td>Pile</td>
<td>5.04</td>
<td>50</td>
<td>Anemia</td>
<td>0.84</td>
</tr>
<tr>
<td>18</td>
<td>Insect repeller</td>
<td>5.04</td>
<td>51</td>
<td>Titanus</td>
<td>0.84</td>
</tr>
<tr>
<td>19</td>
<td>Bleeding</td>
<td>5.04</td>
<td>52</td>
<td>Sinusitis</td>
<td>0.84</td>
</tr>
<tr>
<td>20</td>
<td>Bronchitis</td>
<td>4.2</td>
<td>53</td>
<td>Scorpion sting</td>
<td>0.84</td>
</tr>
<tr>
<td>21</td>
<td>Snake bite</td>
<td>4.2</td>
<td>54</td>
<td>Elephantias</td>
<td>0.84</td>
</tr>
<tr>
<td>22</td>
<td>Menstruation problem</td>
<td>4.2</td>
<td>55</td>
<td>Influenza</td>
<td>0.84</td>
</tr>
<tr>
<td>23</td>
<td>Boil</td>
<td>4.2</td>
<td>56</td>
<td>Backbone pain</td>
<td>0.84</td>
</tr>
<tr>
<td>24</td>
<td>Throat problem</td>
<td>4.2</td>
<td>57</td>
<td>Leucoderma</td>
<td>0.84</td>
</tr>
<tr>
<td>25</td>
<td>Tooth problem</td>
<td>4.2</td>
<td>58</td>
<td>Mellitus</td>
<td>0.84</td>
</tr>
<tr>
<td>26</td>
<td>Vomitting</td>
<td>3.36</td>
<td>59</td>
<td>Aphrodisiac</td>
<td>0.84</td>
</tr>
<tr>
<td>27</td>
<td>Blood purifier</td>
<td>3.36</td>
<td>60</td>
<td>Body pain</td>
<td>0.84</td>
</tr>
<tr>
<td>28</td>
<td>High blood pressure</td>
<td>3.36</td>
<td>61</td>
<td>Ear ache</td>
<td>0.84</td>
</tr>
<tr>
<td>29</td>
<td>Heart disease</td>
<td>3.36</td>
<td>62</td>
<td>Syphilis</td>
<td>0.84</td>
</tr>
<tr>
<td>30</td>
<td>Leprosy</td>
<td>3.36</td>
<td>63</td>
<td>Tenesmus</td>
<td>0.84</td>
</tr>
<tr>
<td>31</td>
<td>Ulcer</td>
<td>3.36</td>
<td>64</td>
<td>Genital problem</td>
<td>0.84</td>
</tr>
<tr>
<td>32</td>
<td>Tooth problem</td>
<td>3.36</td>
<td>65</td>
<td>Diaphoretic</td>
<td>0.84</td>
</tr>
<tr>
<td>33</td>
<td>Abortion</td>
<td>2.25</td>
<td>66</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There are however few plants as well which are found effective in the treatment of ailments like for abortion, gonorrhea, 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 vomica* 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 *Ficus 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 serpentiana* 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.

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References


