



A Survey of Ethnobotanical Plants in The Santal Tribal Community of Shantiniketan, Birbhum, West Bengal, India

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Abstract: The purpose of this study was to collect ethnobotanical data on tribal people from the surrounding areas of Shantiniketan, Birbhum district, West Bengal. With the cooperation of several Santal tribe members and cross-check procedures, an ethnobotanical survey of this area yielded a total of eighty-two plant species belonging to forty families. Thirty plant species have been identified as important medicinal plants. There are a total of twenty-seven species that are natural food sources and five economically important species. The mood of preparation along with used plant parts is discussed with the family and local names for all the plants. Thus, it is an effort to record the valuable ethnobotanical knowledge of the tribe Santal, in the way of the revitalization of traditional herbal medicines, foods, and it is an effort to record the valuable ethnobotanical knowledge of the tribe Santal's of the surrounding areas of Bolpur, Santiniketan. The information obtained could be utilized as a resource for formulating herbal drugs or contemporary medication to cure diseases, as well as a document for preserving ethnomedicinal knowledge in the future.

Keywords: *Ethnobotanical information, Santal tribe, medicinal plants, herbal medicine, natural food source.*

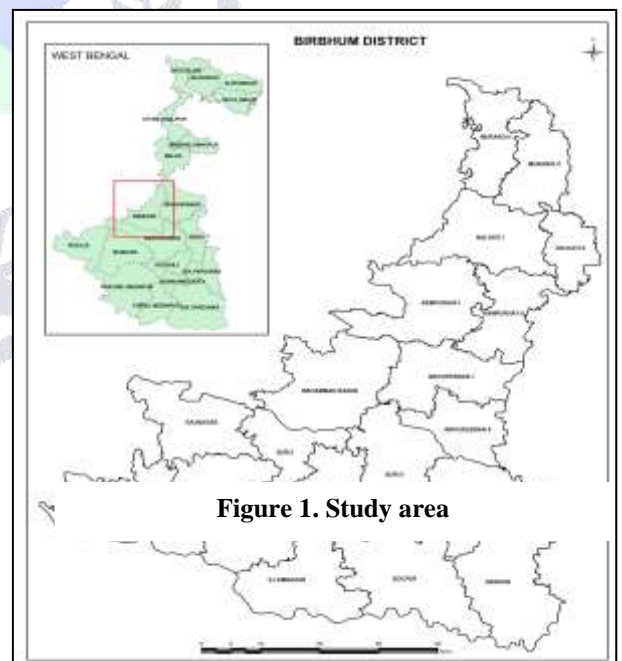
I. INTRODUCTION

Ethnobotany is a branch of biology that deals with the use of biological organisms by ethnic groups. It is sometimes known as ethnographic or tribal botany. India is a diversified country with a wide range of terrain, climate, phytogeographical zones, and cultural groups. When we talk about ethnobotany, we can divide individuals into two groups: those who live in small towns or rural villages, and those who live in remote locations (Shah, 2016). According to Schultes (1962), Ethnobotany is the study of the link that exists between humans of early societies and their plant environment (Schultes, 1962). Tribal or ethnic peoples' ethnobotanical knowledge has played an important role in India since ancient times. Scientific research on medicinal plants and other uses of plants is now considered a significant instrument for ethnobotanical research. Over the last few years, scientific research in the discipline of ethnobotany has been conducted on a variety of topics, including the ethnobotany of certain tribes and places. A few decades ago, Organized studies in economic botany were started on certain plant families and a variety of other sub-disciplinary or interdisciplinary techniques (PULLAIAH, 2017; RAHAMAN & GHOSH, 2007). Discovered ethnopharmacological plants, which have been used by Indian tribal and local people to treat a variety of ailments. Because the majority of diseases in modern society are due to unhealthy diets and harmful drugs, herbal medications can help to mitigate these issues (Sharma and Kumar 2012). The goal of this ethnobotanical examination is to raise pharmacologists' attention to the need for more scientific research (Mondal, 1998). Furthermore, employing traditional herbal medicinal knowledge, various menacing

diseases such as diabetes, memory loss, and a variety of skin disorders may be effectively controlled and further assessed (Ekor, 2014). Apart from medicine, ethnic people also used several plant parts for food and their daily life. A large number of plant parts are used in the construction of houses. This is an eco-friendlier method that can also bring economic stability in rural areas. This means that an economically significant plant used by tribal communities should be studied in order to generate beneficial healthcare and other sustainable products, which will aid us in our quest for sustainability and provide additional aid. Various issues regarding protection and biopiracy have emerged recently as a result of the growing economic focus of biological research based on traditional knowledge. The information's end users are largely third parties with no direct ties to ethnic communities. Now the challenge now is how ethnic people might benefit from sharing their ethnobotanical expertise (Eldeen & Wahid, 2016). Concerns about indigenous rights and equitable profit for both are necessary for long-term viability. Many plants are a viable and potential tool for developing the tribal economy. Until yet, just a small portion of such plants has been professionally studied (Kashung et al., 2020). As a result, it is critical to chronicle and preserves traditional herbal knowledge before it is forgotten. Several ethnobotanical studies on medicinal plants have been conducted in different districts of West Bengal over the last decades (Das & Mondal, 2012; Datta et al., 2014; Dey & De, 2012), focusing primarily on various ethnic groups, but scientific documentation of the traditional knowledge of the Santal tribe in Shantiniketan, Birbhum, West Bengal is not made so far as per literature surveyed. The current study gives important information about the ethnobotanical knowledge of the Santal tribe of West Bengal, Birbhum, who live in and around Santiniketan. This study's results can be used for a variety of economic purposes in the future and act as a document of vital ethnobotanical information.

2. STUDY AREA

Due to the presence of laterite soil, Birbhum, a district in West Bengal (RahrBengal), is known as the "LAND OF RED SOIL." Birbhum is thought to be derived from the word 'Bir-Bhumi.' 'Bir' means forest in the Santali language. Birbhum is primarily an agricultural district. The eastern half of Birbhum is primarily a rice-growing region. The Chhoto Nagpur Plateau extends towards the western half of this district. Herbs and shrubs are mostly found through several forests dominated by *Shorea Robusta*. According to Chandra, the Rahr region encompasses more than two-thirds of the Birbhum district. Birbhum is located at 23.8402° N and 87.6186° E. The total area is 4550 square kilometers. Santhals are one of the largest homogeneous tribal communities of India, counting more than 10 million people. Despite this geographical distance, Santhals share the same language, cultural tradition, and values. Santals have 11 sub group such as Hansda, Soren, Murmu, Tudu, Kisku, Hembram, Baske, Besra etc.



2. MATERIALS AND METHODS

Frequent field surveys were carried out to collect ethnobotanical knowledge from different tribal communities in the Bolpur sub-division. Based on methods given by Gidey (2010), structured interviews, observation, and guided field walk with informants were employed to collect data. As a result, a total of eight informants (4 males and 4 females) from 6 distinct tribal communities were deliberately selected with the support of senior residents. "Janguru" (traditional medicinal practitioners) were identified as potential informants and subsequently participated in personal interviews.

3. RESULTS AND DISCUSSION

The findings of the field survey are reported in the following sections. Plants are grouped according to their usefulness and family. For each plant, information on the Santal name, scientific name, family, parts used, and ethnomedicinal usage has been provided. A total of eighty-two plant species from forty families have been discovered. Thirty plant species have been identified as valuable medicinal plants; twenty-seven species have been classified as natural food sources, and five species have been identified as economically important.

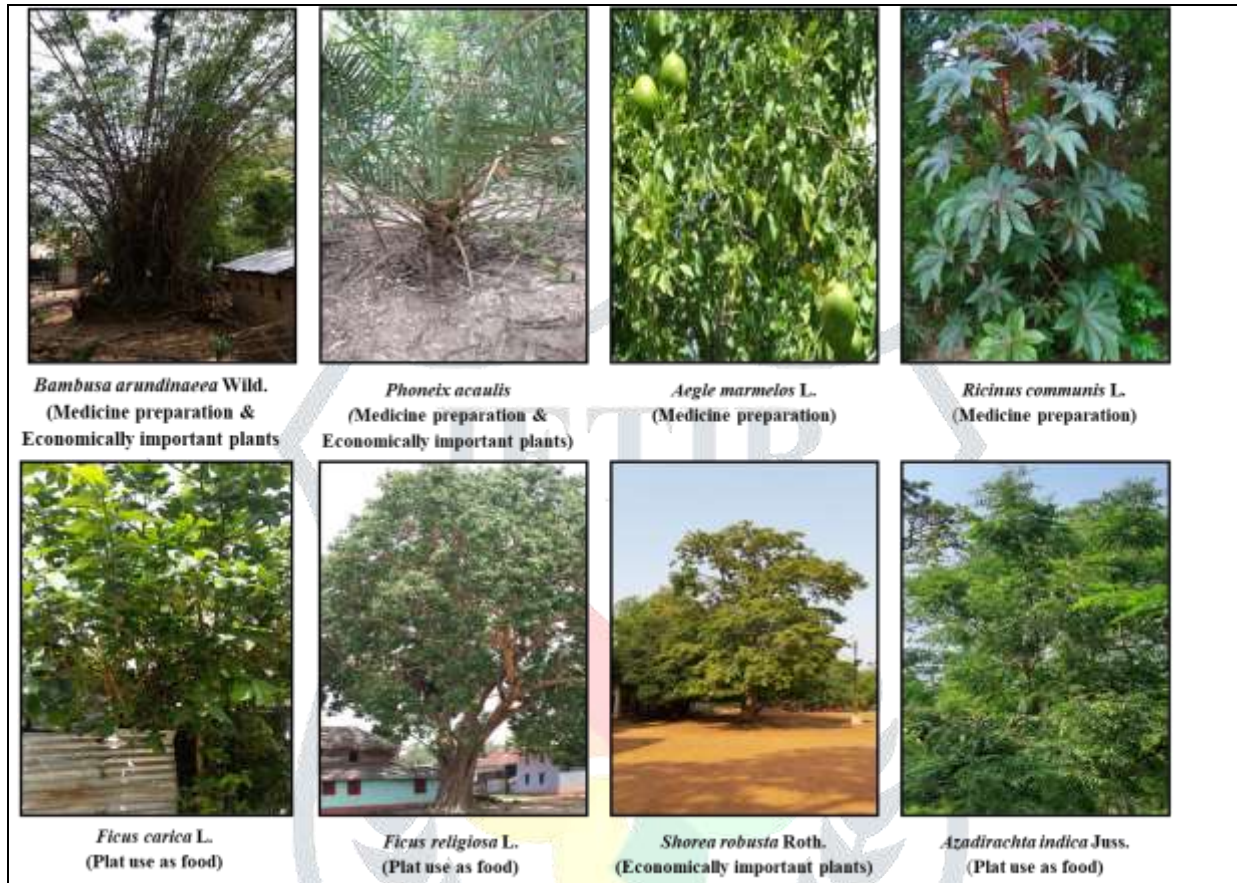


Figure 2. Plants imagery with their use

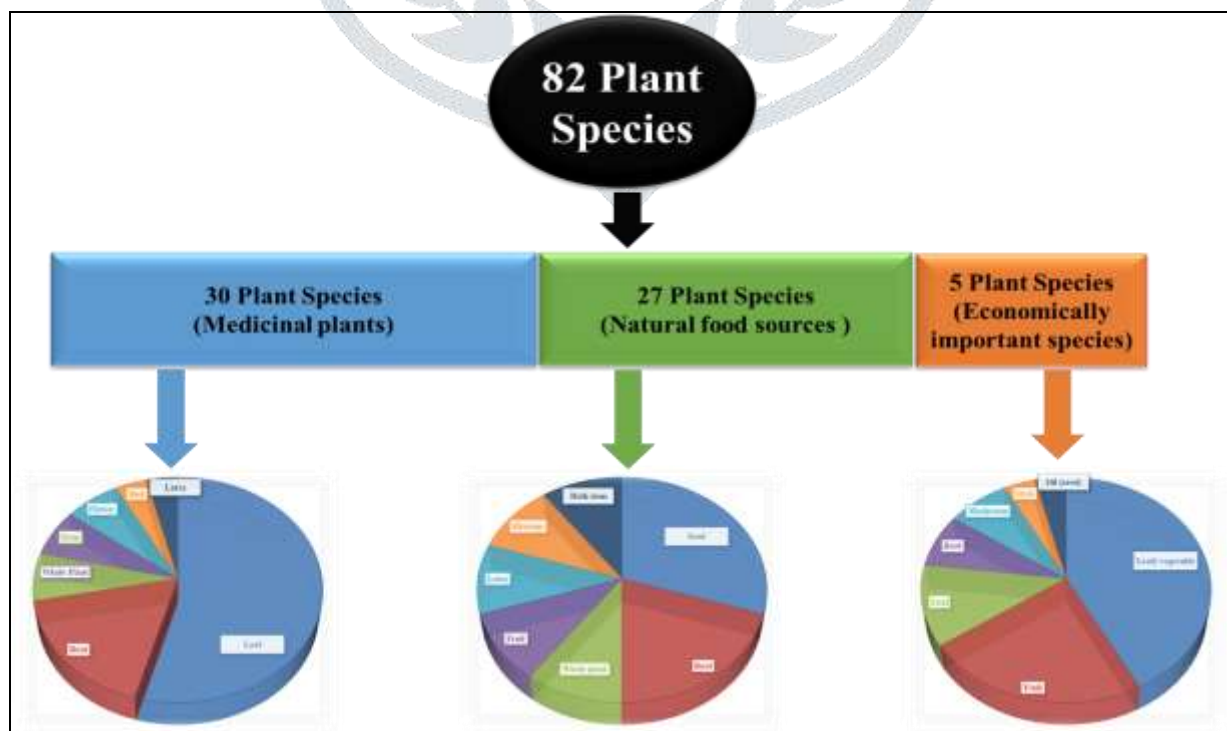


Figure 3. Ethnobotanical plant species distributions for Shantinikatan area

4.1. PLANTS USED FOR MEDICINAL PURPOSE

4.1.1. MONOHERBAL PREPARATION

The use of only one plant in a medical preparation is known as Mono-Herbal formulation (MHF). The principle can be found in Ayurvedic medical systems, where a specific herb is utilized to treat sickness. We detected 82 plant species belonging to 42 families, including 27 plant species employed in monoherbal medicinal plant/herbal medication formulation. There are fifteen different varieties of leaves, five roots, two stems, one flower, one seed, and one bud are used to prepare different types of Monohedral medicine. Details of the plants are given below:

Table 1. Plants used for monoherbal preparation

Sl no.	Scientific name	Tribal name	Family	Plant parts used	Disease cured/ treated	Mode of use
1	<i>Achyranthes aspera</i> L.	Apang	Amaranthaceae	Whole plant	Any kind of wound	Use externally
2	<i>Area lanata</i> (L.)Juss.	Doekhoe	Amaranthaceae	Flower	Toung infection	Mixed dried flower powder with oil and apply on the tongue.
3	<i>Ricinus communis</i> L.	Jadadare	Euphorbiaceae	Leaf	Reduce the labor pains	Leaves are heated up and fomented on the abdomen of a pregnant woman
4	<i>Calotropis</i> sp	Aakayanamakam	Asclepiadaceae	Leaf	Sinus/Fiver	Leaf soaked in oil is warmed before place it over chest/ head
5	<i>Cissus quadrangul-aris</i> L.	Harjora	Vitaceae	Latex/ Leaves	Fracture	Latex/ leaves juice are used externally on fractured areas for healing
6	<i>Phonix</i> sp	Khejuri	Arecaceae	Root	To skip the complexity of pregnancy	Roots are tight with hair of the pregnant woman
7	<i>Euphorbia fusiformis</i> Buch.Hem.exD.Do n.	Putakan	Euphorbiaceae	Root	Poor lactation	Rootstocks are boiled and orally consume
8	<i>Bambusa arundinacea</i> Wild.	Mah-mundho	Poaceae	Bark of Stem	Blood coating	The bark of bamboo stem peels off and heated and use over the wounded area
9	<i>Martynia annua</i> L.	Vidhi lathah	Martyniaceae	Root	To treat snake bite	Use externally
10	<i>Aegle marmelos</i> L.	Sinjo	Rutaceae	Root	High fever	Oral consumption of pasted root with honey
11	<i>Centella asiatica</i> L.	Than-Khan Sukam	Apiaceae	Leaf	Constipation	Oral consumption of pasted leaves
12	<i>Paderia foetida</i> L.	Gasai-Sakam	Rubiaceae	Leaf	Constipation	Cooked leaves as food
13	<i>Tagetes</i> sp	Kushnidare	Asteraceae	Leaf	Wound/ Blood clotting	Leaves pasted use externally over wounded areas
14	<i>Pongamia pinnata</i> L.	Karenj	Fabaceae	Seed	Arthritis	Seed oil used externally
15	<i>Jatropha gossypifolia</i> L.	Vendradare	Euphorbiaceae	Twigs	Making strong teeth	Brushing teeth
16	<i>Mimosa pudica</i> L.	Jhoupandare	Fabaceae	Whole plant	Bodyache	Pasted plants are used externally
17	<i>Paperomia pellucid</i> Kunth.	Kanthaara	Piperaceae	Root	Abdominal pain	Cook with vegetable
18	<i>Psidium guajava</i> L.	Anjil	Myrtaceae	Leaf	Diarrhea	Orally consumption of leaf pest
19	<i>Dalbergia sissoo</i> Roxb.	Sisu dare	Fabaceae	Leaf	Ankel jostling	Pasted leaves are used externally

20	<i>Aloe vera</i> (L.)Burm.f	Ghikumari	Asphodelaceae	Leaf	Headache	Leaf slice placed on the skull
21	<i>Nyctanthes arbor-tristis</i> L.	Siuli	Oleaceae	Leaf	Fiver	Oral consumption of pasted leaves
22	<i>Citrus maxima</i> Merr.	Jambir	Rutaceae	Leaf	Cold/Sinus	Leaves are boiled in water and take a bath with the water
23	<i>Hibiscus rosa-sinensis</i> L.	Joba	Malvaceae	Bud	Leukorrhea	Oral consumption of pasted overnight-shocked bud
24	<i>Bryophyllum pinnatum</i> (Lam.)Oken.	Pathar kuchi	Crassulaceae	Leaf	Leukorrhea	Oral consumption of pasted leaves with water
25	<i>Tragia involucrate</i> L.	Sengelsing	Euphorbiaceae	Leaf	Headache	Leaf smear with oil and placed in the head
26	<i>Enydra fluctuans</i> Lour.	Keshuti	Asteraceae	Leaf	Diarrhea	Oral consumption of boil leaves.
27	<i>Hygrophila auriculata</i> Schumach.	Dangrakata	Acanthaceae	Leaf	Anemia	Oral consumption of boil leaves stock

4.1.2. POLYHERBAL PREPARATION

The use of more than one plant in a pharmaceutical composition is known as Polyherbal preparation (PHF). The principal may be found in Ayurvedic medicinal systems, where multiple herbs are combined in a certain ratio to treat diseases. In polyherbal preparations, more than one plant is employed to make a single ready-to-use medicine. Here we find four different types of medicine made from ten different plant species belonging to ten different families. Two types of roots, one type of fruit, three types of seed, and one type of rhizome are found to make various forms of polyherbal medicine.

Table 2. Plants used for polyherbal preparation

Sl no.	Scientific name	Tribal name	Family	Plant parts used	Disease cured/ treated	Mode of use
1	<i>Carica papaya</i> L.	Pipo	Cariaceae	Latex	For abortion up to 5 th month of pregnancy	Latex of <i>Carica papaya</i> is mixed with the pest of <i>Cuscuta reflexa</i> . The mixture is coated along with the fresh root of <i>Achyranthes aspera</i> along with <i>Piper nigrum</i> and properly place in the vagina of pregnant woman
	<i>Cuscuta reflexa</i> Roxb.	Swarnolata	Convolvulaceae	Whole plant		
	<i>Piper nigrum</i> L.	Golmorich	Piperaceae	Seed		
	<i>Achyranthes aspera</i> Linn.	Apang	Amaranthaceae	Root		
2	<i>Curcuma longa</i> L.	Sasang	Zingiberaceae	Rhizome	Boils	Pest of rhizome of <i>Curcuma longa</i> and fruits of <i>tamarindus indica</i> mixed with soil and applied in boils
	<i>Tamarindus indica</i> L.	Jojo	Caesalpiniaceae	Fruits		
3	<i>Ficus benghalensis</i> L.		Moraceae	Root	Pain in abdomen	Oral consumption of boil root juice of <i>Ficus benghalensis</i> along with <i>Piper nigrum</i> seed crushed.
	<i>Piper nigrum</i> L.	Golmorich	Piperaceae	Seed		
4	<i>Mimosa pudica</i> L.	Jhoupandare	Fabaceae	Stem and root	Leukorrhea	Oral consumption of stem and root pest of <i>Mimosa pudica</i> crushed seed of <i>Piper nigrum</i> .
	<i>Raphanus raphanistrum</i> L.	Mulouita	Brassicaceae	Seed		

4.2. PLANTS USED FOR FOOD PURPOSE

For food purposes, twenty-five plant species belonging to nineteen families and two types of mushrooms belonging to two families have been observed. Among them, eleven types of leafy vegetables, six types of fruit, three types of leaf, two types of the root, one type of stem, and one type of cooking oil from seed are used as their diets.

Table 3. Plants used for food purpose

Sl no.	Scientific name	Tribal name	Family	Plant part use
1.	<i>Fiscus riligiosa</i> Bl.	Hesaara	Moraceae	Leafy vegetable
2.	<i>Buchanania longifolia</i> Roxb.	Tarahbili	Anacardiaceae	Fruit
3.	<i>Manilkara zupota</i> (L)P.Royen	Birkuidi	Sapotaceae	Fruit
4.	<i>Madhuca</i> sp.	Matcom	Sapotaceae	Cooking oil from the seed
5.	<i>Nympha</i> sp.	Olro	Nymphaeaceae	Root
6.	<i>Neolamarackia cadamba</i> (Roxb)Bossler.	Kadam	Rubiaceae	Fruit
7.	<i>Moringa oleifera</i> Lam.	Chatamara	Moringaceae	Leafy vegetable
8.	<i>Ipomoea aquatica</i> Forssk.	Kurbiara	Convolvulaceae	Leafy vegetable
9.	<i>Hygrophila auriculata</i> Schumach.	Dongraara	Acanthaceae	Leafy vegetable
10.	<i>Brassica nigra</i> L.	Turiara	Cruciferae	Leaf
11.	<i>Langenaria Bulgaris</i> Molina(Standl)	Hotoara	Cucurbitaceae	Leafy vegetable
12.	<i>Glinuss oppositifolius</i> L.	Gimiara	Molluginaceae	Leafy vegetable
13.	<i>Cucurbita maxima</i> Duchesne.	Koldahara	Cucurbitaceae	Leafy vegetable
14.	<i>Solanum tuberosum</i> L.	Aluara	Solanaceae	Leafy vegetable
15.	<i>Carica papaya</i> L.	Piposkam	Caricaceae	Leafy vegetable
16.	<i>Paederia foetida</i> L.	Gasaisakam	Rubiaceae	Leafy vegetable
17.	<i>Bahuhinia</i> sp.	Sinara	Fabaceae	Leafy vegetable
18.	<i>Paperomia pellucid</i> Kunth.	Kanthaara	Piperaceae	Leafy vegetable
19.	<i>Colocasia esculenta</i> L.	Saruhbaho	Araceae	Root
20.	<i>Ficus racemosa</i> L.	Poroh	Moraceae	Leaf
21.	<i>Ficus racemosa</i> L.	Lowa	Moraceae	Fruit
22.	<i>Volvariella volvacea</i> (Bul)Singer	Busu-utt	Pluteaceae	Mashroom
23.	<i>Termitomyces</i> sp.	Arto-utt	Lyophyllaceae	Mashroom
24.	<i>Dimocarpus longan</i> L.	Cheala	Sapindaceae	Fruit

25.	<i>Colocasia esculenta</i> L.	Saruhrahe	Araceae	Stem
26.	<i>Azadirachta indica</i> Juss.	Nim dari	Meliaceae	Leaf
27.	<i>Bombax ceiba</i> L.	Adeldari	Malvaceae	Fruit

Aside from the plant mentioned above, they consume a variety of plants and plant components daily. We left off the common vegetable and leafy vegetable because they are well-known throughout India. Another significant feature of the tribal food is 'Handia,' an alcoholic beverage made specifically by the Santal people using Ranu (the root of *Agnihada* sp.) and other herbs.

4.3. ECONOMICALLY IMPORTANT PLANTS

In the case of economically important plants, five major types of plant species belonging to four families are mentioned. They are used in different plant parts in different cases.

Table 4. Economically important plants

Sl no.	Scientific name	Family	Tribal name	Plant part used
1.	<i>Oryza sativa</i> L.	Poaceae	Busuw	Use in the roof of the house
2.	<i>Borassus</i> sp.	Arecaceae	Tali sakam	As a fuel, making mat and thatching of house
			Tali mundho	Use in making house and fuel also
3.	<i>Shorea robusta</i> Roth.	Dipterocarpaceae	Sarjom sakam	Fuel, use in making plate
			Sarjom dari	Stem as fuel It also used in their social purpose such as marriage, cultural program
4.	<i>Phoenix</i> sp.	Arecaceae	Khejuri	Handmade leaf matt
5.	<i>Bambusa</i> sp.	Poaceae	Bolunchuku	Special container
			Mah	Bed made by bamboo
			Ghuni	Fishing net
			Gurupasi	Making house

5. CONCLUSION

With each passing generation, the modern developing world's growing affinity for a fast-paced modern living has resulted in a loss of traditional knowledge of how to use plants and plant parts in our lives. Due to a lack of communication and neglect on both sides, tribal people living in rural areas rely on herbal methods, whilst urban people rely more on modern medicine. During our survey, we discovered that the younger generation is not fond of any form of herbal or traditional plant use. The information obtained can be used for a large-scale study to discover ethnomedicinal uses of medicinal plants and their active ingredients through clinical analysis, which can aid current science. The usage of various plant parts in everyday household items is also eco-friendlier and more sustainable. For a developing future, it appears critical to maintain and utilize traditional plant knowledge, which could help modern society's economic elements.

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