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RESEARCH ARTICLE

Ethnomedicinal plants used by inhabitants of Naoboicha Sub-Division, Lakhimpur district, Assam

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Abstract

This study aimed to explore, enumerate, and document the ethnomedicinal plants utilised by the indigenous population of the Naoboicha Subdivision, Lakhimpur District, Assam, for the treatment of various physical ailments. A comprehensive field survey included personal interviews and group discussions. A total of 103 informants, comprising 57 females and 46 males, were interviewed. Furthermore, exclusive interviews were conducted with traditional healers, known as 'Bez', to obtain authentic information on ethnomedicines. This study enumerates 65 medicinal plants, belonging to 41 families, utilised to treat 77 types of ailments in the Naoboicha Subdivision. Herbs constitute the largest group of plants employed for medicinal purposes, with leaves being the most frequently harvested part utilised for preparing remedies. While traditional healers are generally reluctant to disclose their complete knowledge, the exploration and documentation of these ethnomedicinal plants are crucial for the conservation of indigenous and traditional knowledge.

Keywords: Ethnomedicine; Naoboicha; Lakhimpur; Traditional Healers; Medicinal Plants; Conservation

1. Introduction

Ethnomedicine broadly refers to traditional medical practices concerned with the cultural interpretation of health, diseases, and illnesses that address healing and health care (Krippner and Staples, 2003). Before the expansion of modern medicine in the healthcare system, indigenous populations around the world relied on herbal medicines for many decades (Aburjai et al., 2007). The practice of traditional medicine varies extensively from region to region depending on several factors such as history, culture, community attitudes, and philosophy (Savikin et al., 2013). of the recorded 422,000 species of blooming plants, 50,000 flowering plants are believed to be utilised medicinally worldwide (Govaerts, 2001; Schippmann et al., 2002). India has 45,000 officially recognised plant species, and other estimates have its 7500 known medicinal plant species distributed in 16 agroclimatic zones (Paul et al., 2005).

The state of Assam, which is in Northeast India, is renowned for having a wide variety of medicinal plants. Different communities across the state are known to treat various diseases using herbal treatments. The ethnic tribes of Assam still rely on their ancestral medical systems, especially those living in remote forest locations (Dutta and Dutta, 2005). Numerous wild plants have been used as both food and medicinal agents (Basumatary et al., 2014). Similarly, residents of the Lakhimpur district, which is located in the easternmost part of Assam, rely substantially on forest resources for food, shelter, healthcare, etc. Plants have always been an integral part of traditional health care systems. Considering the rich traditional ethnomedicinal knowledge, this study was conducted to explore and record medicinally important plants used by the locals of this region.

2. Materials and method

2.1. Study area

This study focuses primarily on Naoboicha, a subdivision of the North Lakhimpur district, which is located in a landscape with a variety of natural features in the northeastern part of Assam (Figure 1). It is located between 94.68402°E and 27.41535°N latitudes. There were 148 settlements within the Naoboicha subdivision. This subdivision has a total land area of 255 square Kilometres. The environment is humid and subtropical at moderate temperatures. Based on rainfall, air temperature, and soil quality, many plant species are abundantly available in the area. The climate is humid and subtropical, with moderate temperatures. Along with evergreen, semi-evergreen, and deciduous forests, this subdivision also features wetlands, grasslands, and woodlands.

2.2. Ethnobotanical data collection

Ethnobotanical data were collected from 4 April 2022 to 31 August 2022 in the Naoboicha subdivision, Lakhimpur district, Assam through a random survey. During the ethnobotanical study, various common methodologies and techniques were applied. All relevant data were collected through personal interviews with 103 informants, of which 46 were male and 57 were female. There was an exclusive interview with traditional healers known as 'Bez', conducted for authentic information on ethnomedicines. The information from each participant was carefully recorded during

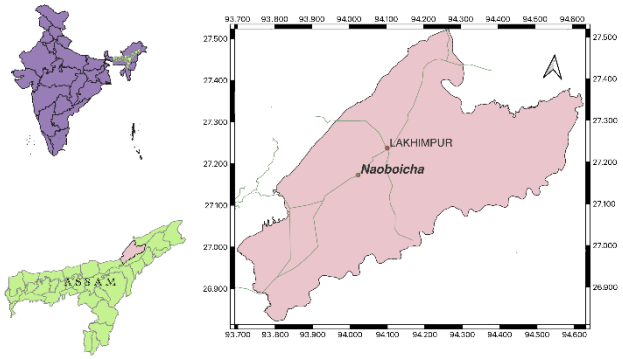

Figure 1. Map of study Area: Naoboicha subdivision, North Lakhimpur district, Assam.

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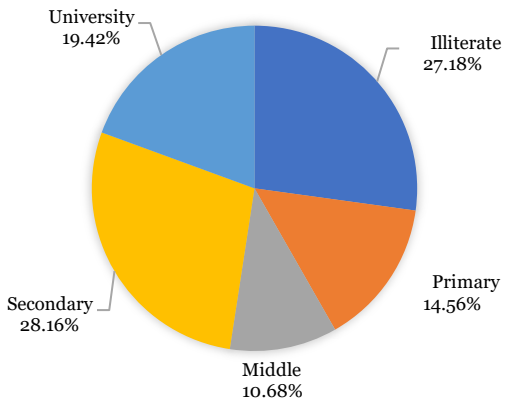

Figure 3. Educational status of the informants in Naoboicha subdivision, Lakhimpur district, Assam.

the interviews. The plants were identified using the reference books of Dutta (1975), Hooker (1872-97), and Kanjilal et al (1937-40). Voucher specimens were collected and processed according to standard methods (Jain and Rao, 1976). Accepted names of the plant were verified in POWO (2023), and taxonomic data such as family, scientific name, local name, habit, part used, mode of preparation, dosage, and ailments treated were recorded in a field notebook.

Experienced adults, patients, and local healers were the main sources of information regarding local names, parts of plants used, dosages, methods of preparation, and ailments treated.

3. Results and discussion

3.1. Demography of informants

Among the 103 informants interviewed, the highest numbers of informants were recorded in Haribor Doloni and Haribor Naharani village. The survey revealed that 48.54% of the informants were not traditional healers, but possessed substantial knowledge of ethnomedicinal plants. The educational status of participants is shown in Figure 2. The respondents had a wide age range and diverse occupations. Among the youngest age group (15–29 years), twelve respondents were students. The participants of age group 30–39 years were primarily teachers, pharmacists, beauticians, and traditional healers. The largest age group in the survey was found to be 40–49 years, with respondents engaged in various occupations, such as Anganwadi workers, ASHA workers, therapists, dental lab technicians, professors, veterinarians, nurses, housewives, and traditional healers. Respondents of age group 50–59 years included professors, housewives, cultivators, carpenters, pharmacists, labourers, civil servants, businessmen, and traditional healers. Those fall within age group 60–79 years contributed to the survey as retired professors, teachers, shopkeepers, tailors, housewives, and traditional healers. Finally, four respondents were found to be within the age group between 80–89 years, all of whom were traditional healers. This demographic distribution highlights the diverse expertise and experience of the informants, enriching the ethnomedicinal knowledge gathered during the field survey.

3.2. Taxonomic diversity of medicinal plants

A total of 65 medicinal plant species belonging to 41 taxonomic families were used by local people to treat 77 human ailments in the study area (Table 1). Figure 3 depicts some medicinal plants collected from the study area. Among the families that contributed the most medicinal plant species, Lamiaceae was represented by six species, followed by Malvaceae with four species (Figure 4). These plants exhibit diverse growth habits, including herbs (representing the majority of which are readily accessible and widely utilised in various preparations), shrubs (used for both medicinal and cosmetic applications), trees (valued for their bark, leaves, and fruits), and climbers (frequently employed in remedies requiring tender shoots or leaves). Herbs constituted the highest proportion (43.08%) of the plant habits found to be used as medicine (Figure 5).

Habitat diversity is of equal significance, as these plant species thrive in a range of ecosystems, from aquatic environments (e.g. *Marsilea minuta*) to terrestrial habitats (e.g. *Zingiber officinale*). Some species are adapted to cultivated areas, whereas others grow

Figure 2. Some medicinal plant collected from Naoboicha subdivision, Lakhimpur district Assam: (a) *Kalanchoe pinnata*, (b) *Paederia foetida*, (c) *Houttuynia cordata* (d) *Hibiscus acetosella* (e) *Corchorus capsularis* (f) *Persicaria chinensis* (g) *Vitex negundo,* (h) *Murraya koenigii* (i) *Tinospora cordifolia*

in natural forests and wetland environments. This ecological adaptability underscores the extensive knowledge of the local population in identifying and utilising plants from diverse environments, thereby ensuring a sustainable supply of medicinal resources.

3.3. Plant part harvest, preparation of dosage and ailment types

This study provides comprehensive insights into the harvesting of distinct plant parts, the preparation of herbal formulations, and the treatment of ailments. It elucidated the utilisation of 11 different plant parts, namely, rhizomes, leaves, bulbs, latex, fruit, flowers, stem, seed, bark, buds, and pulp, employed in various diseases. Among the most frequently utilised plant parts are leaves, which are valued for their abundance and ease of collection. Roots and rhizomes, known for their concentrated bioactive compounds, are commonly employed in remedies for ailments, such as dermatological conditions and gastrointestinal disorders. Fruits are utilised either in raw or processed form for their nutritional and therapeutic benefits, whereas flowers, latex, bark, and stems are reserved for specific treatments. For instance, the latex of *Alstonia scholaris* is utilised to treat abscesses, while the bark of *Mimusops elengi* is used for dental ailments.

The documented plants were utilised to address a broad spectrum of ailments. These range from common issues, such as indigestion, dysentery, and colds, to chronic conditions, including diabetes, hypertension, and rheumatoid arthritis. Dermatological problems, including skin diseases, wounds, and acne, are also well-represented among the treated conditions. This diversity in applications underscores the comprehensive nature of traditional medicinal practices.

Herbal preparation methodologies are deeply rooted in tradition and emphasise simplicity and efficacy. Grinding and extraction of juices are prevalent techniques, particularly for the leaves and rhizomes, as observed in remedies for menstrual discomfort and respiratory disorders. Boiling and cooking are frequently employed for roots, fruits, and leaves, and these preparations are occasionally combined with additional ingredients, such as lentils or spices, to enhance their therapeutic potential. Topical applications of grinded plant materials are widely utilised for treating dermatological conditions and wounds, while mixtures with natural additives, such as honey, salt, or milk, are employed to improve palatability and potency. Dosages are pragmatically measured using practical units, such as hand palms, teaspoons, and pieces, ensuring accessibility and ease of administration. This empirical knowledge accumulated over generations demonstrates a fine balance between tradition and utility, underlining the enduring relevance of ethnomedicine in contemporary healthcare systems.

Similar to the present ethnomedicinal findings, leaves constitute the major plant part used in several studies (Basumatary et al., 2014; Payum et al., 2014; Gogoi and Nath, 2021). Compared to other plant parts, the use of leaves ensures the sustainability of the plant and its subsequent conservation because it causes less damage

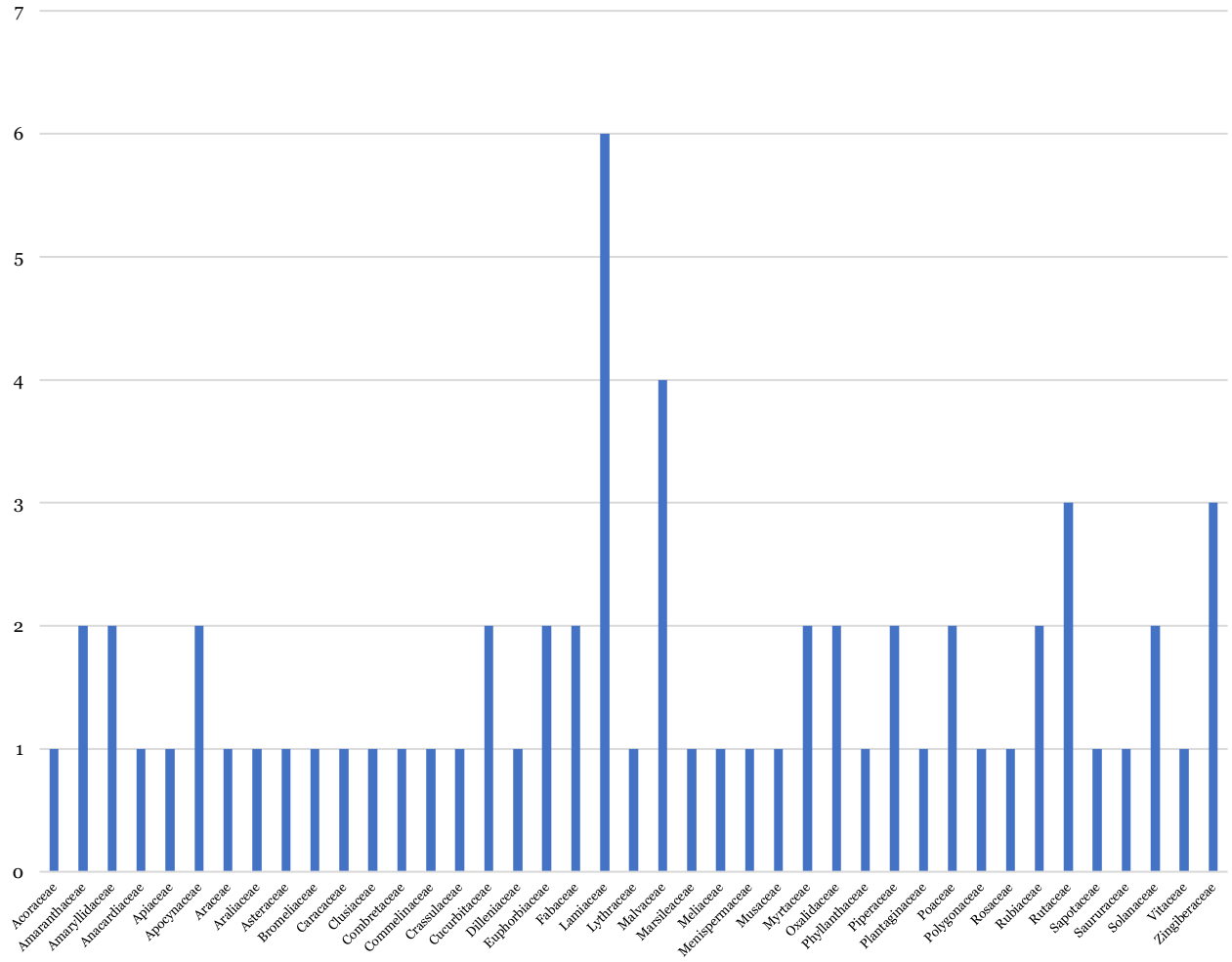

Figure 5. Distribution across the taxonomic families of medicinal plants collected from Naoboicha subdivision, Lakhimpur district Assam.

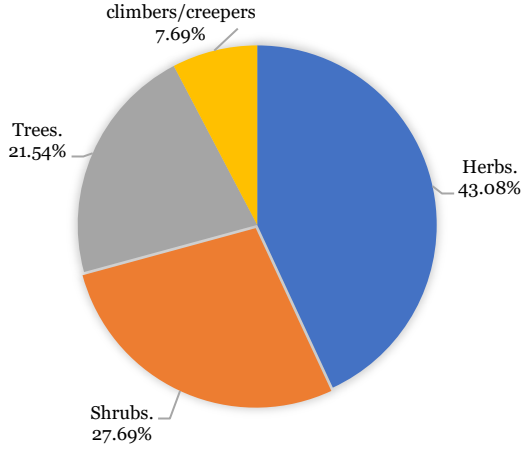

Figure 4. Distribution across different habits among the collected medicinal plants from Naoboicha subdivision, Lakhimpur district

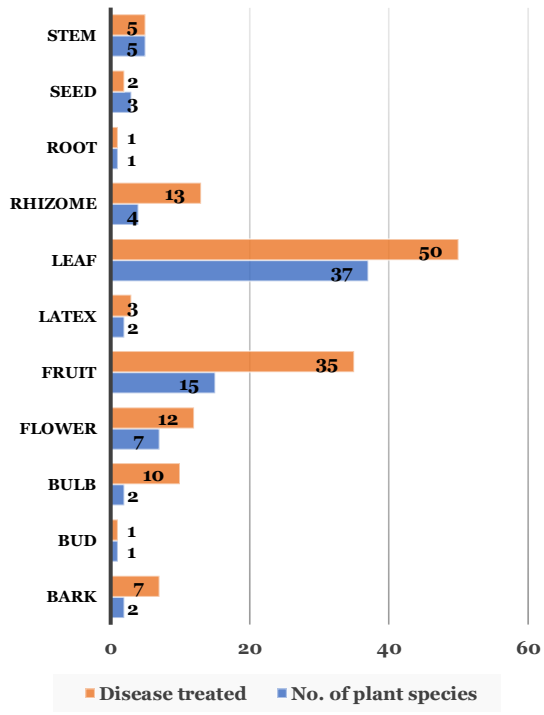

Figure 6. Plant parts used for the preparation of remedies for treatment of diseases among the Assamese of in Naoboicha subdivision, Lakhimpur district Assam.

to the plant (Panmei et al., 2019). The flower of *M. balbisiana*, which is finely chopped and cooked along with pigeon meat, was found to be the most popular homemade medicine used for the treatment of low blood pressure. Unripe *M. balbisiana* fruit starch is a non-traditional source of starch with unique functional characteristics that indicate a wide range of potential uses in food systems and other industrial applications (de la Torre-Gutiérrez et al., 2008). The plant is known to have a wide range of pharmacological activities, including antidiabetic, antibacterial, anticancer, and hepatoprotective properties. Although *M. balbisiana* has a variety of pharmacological properties, its antibacterial and antidiabetic properties have received the most attention, whereas other features, including contraceptive and anticancer activities, have received less attention (Swariary, 2012). This study also reported *that D. indica* is an important medicine for diabetes. The fruit and juice of the plant are traditionally used for the treatment of Diabetes Mellitus, which was established through a review of the literature on the medicinal properties of *D. indica* (Kumar et al., 2011; Talukdar et al., 2012).

According to estimates from the World Health Organization, the majority of people in poor countries rely on herbal medicines for their primary health care needs. Traditional healthcare systems are crucial for indigenous rural communities. In India, approximately 80% of the population uses herbal medicines to treat various disorders (Farnsworth, 1993). Some similar ethnomedicinal plants used by the people of North Lakhimpur are reported to be of medicinal importance, based on the findings of Rudip et al (2012) and Choudhary et al (2012) from different districts of Assam. There has been an increasing demand for the use of medicinal plants because of their low cost, easy availability, and fewer side effects in villages. However, the majority of traditional healers are not willing to disclose the name of the plant used for curing physical ailments, which creates a barrier in the scientific documentation of traditional knowledge.

The native populations employed medicinal plants as first aid. They stated that medical interventions are inferior to those made using medicinal plants. There are some people in the localities known as 'Bez' who use these herbs to treat patients. By using these medicinal plants appropriately, people in rural areas can receive treatment at minimal cost with no adverse effects. A wealth of information on the conventional applications of medicinal herbs is usually passed down from generation to generation orally, which is needed to preserve indigenous ethnobotanical knowledge.

4. Conclusion

The inhabitants of the Naoboicha Sub-division possess extensive knowledge of medicinal plants, which constitutes a significant component of their cultural heritage. This investigation documented 65 plant species that are fundamental to traditional healthcare practices in this region, providing a valuable repository of ethnomedicinal information. Through scientific documentation of this traditional knowledge, this study contributes to the preservation of cultural heritage and biodiversity conservation efforts. The findings from this study demonstrate considerable potential for future pharmacological studies aimed at identifying novel therapeutic agents. Furthermore, they offer insights into the development of sustainable harvesting and conservation strategies for medicinal plants, thereby ensuring their availability for subsequent generations. Additionally, this study has the potential to empower local communities by elucidating the economic prospects of these medicinal resources through their sustainable and ethical utilisation.

Acknowledgements
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Authors contribution
All authors have equally contributed to the concept, research design, fieldwork, and finalisation of the manuscript.

Conflict of interest
Authors have no conflict of interest

Table 1. Checklist of the ethnomedicinally significant medicinal plant collected from Naoboicha subdivision, Assam.

Family	Scientific name and Collection No	Local name	Habit	Part used	Mode of preparation	Dosage	Ailment
Acoraceae	*Acorus calamus* L. PG06, 04-04-2022 Haribor Naharani	Boch	Herb	Rz	Rhizomes are cut into pieces and made a garland and worn around the neck of newly born baby.	5 pieces	Cold and Cough, Fever
				Rz	Rhizomes are grounded with *Allium sativum* and put on the affected area.	As much as you need	Toothache, Dental caries
Amaranthaceae	*Alternanthera sessilis* (L.) DC. PG036, 24-04-2022 No.2 Sonapur	Mati kaduri	Herb	Lv	Leaves are cooked with *Oxalis corniculata* and *Oldenlandia corymbosa* and then taken orally.	½ hand palm	Indigestion, Dysentery
Amaranthaceae	*Spinacia oleracea* L. PG04, 28-07-2022 Haribor Doloni	Paleng	Herb	Lv	Finely chopped the leaves, *Daucus carota* and *Solanum lycopersicum*. Add salt and mixed the ingredients well and then consumed orally.	½ hand palm from the mixture	Anaemia
Amaryllidaceae	*Allium sativum* L. PG051, 14-08-2022 Naharbari	Nohoru	Herb	Bul	Raw garlic is eaten with rice.	3 cloves	High blood pressure
				Bul	Bulbs are ground and applied to the affected area.	3 cloves	Alopecia
				Bul	Bulbs are ground with *Curcuma longa*, and then applied to the affected area.	As much as you need	Skin disease
				Bul	Bulb are cut into pieces and made garland and worn around the neck of newly born babies.	5 pieces	Cold and Cough
				Bul	Juice of the bulb are applied to the affected area.	1 clove	Ringworm
				Bul	Bulb are fried with mustard oil and massaged	3 cloves	Cold
				Bul	Juice of the bulb are mixed with butter and then taken.	2tsp.	Rheumatoid arthritis
Amaryllidaceae	*Allium cepa* L. PG028, 17-07-2022 Bolama	Piyaj	Herb	Bul	Bulb is eaten raw.	1 bulb	Low blood pressure
				Bul	Bulb is grounded and applied to hairs.	1 bulb	Alopecia, Pediculosis
Anacardiaceae	*Mangifera indica* L. PG053, 31-07-2022 Kathal Pukhuri	Aam	Tree	Fr (ripe)	Ripe fruits are ground and mixed with milk and applied to face.	1 fruit	Reduce facial glow
				Fr (ripe)	Ripe fruits are ground and mixed with milk and then taken orally.	1 fruit	Weakness
Apiaceae	*Centella asiatica* (L.) Urb. PG057, 05-06-2022 Digh Pukhuri	Bor manimuni	Creeping herb	Lv	Juice of the leaves is taken.	25 ml	Constipation
				Lv	Ground the leaves with the leaves of *Hydrocotyle sibthorpioides,* and the juice is taken orally.	½ cup	Dementia, Dysentery, Diarrhoea
				Lv	Leaves are cooked with the leaves of *Paederia foetida*, fish, ginger, garlic and black pepper and then taken orally.	½ bowl from the curry	Body pain
Apocynaceae	*Alstonia scholaris* (L.) R. Br. PG040, 17-04-2022 Lothow Pathar	Chotiona	Tree	Lat	Latex is applied to the affected area.	2 drops	Abscess & Toe crack
Apocynaceae	*Catharanthus roseus* (L.) G. Don PG056, 16-06-2022 Haribor Naharani	Nayantora	Shrub	Lv	Juice of the leaves is consumed daily.	3 leaves	Diabetes
				Lv	Leaves are grinded and applied to the affected area.	1-2 leaves	Toothaches
Araceae	*Colocasia esculenta* (L.) Schott PG029, 14-08-2022 Rahali Gaon	Kochu	Herb	Lv	Leaves are cooked with meat (add red chilli) and then taken orally.	½ bowl	Anaemia
				Lv	Juice of the leaf stalk is applied to the affected area.	2 drops.	Cuts and Wounds
Araliaceae	*Hydrocotyle moschata* G.Forst. PG025, 01-05-2022 No.1 Pukhuri Paria	Horu manimuni	Creeping herb	Lv	Leaves are grounded with *Centella asiatica*, *Oldenlandia corymbosa* and *Piper nigrum*. Add small amount of salt and consumed.	2 tsp.	Pneumonia, Cold & Cough
				Lv	Leaves are grinded with *Oldenlandia corymbosa* and the juice is taken orally.	2 tsp.	Stomach ache
				Lv	Juice of the leaves is taken orally.	2tsp.	Irregular menstruation & Menstrual cramps
				Lv	Leaves are grinded and applied to the affected area.	20-25 leaves	Cuts and Wounds
				Lv	Leaves are cooked and then taken.	½ bowl from the curry	Dysentery

Asteraceae	*Ageratum conyzoides* L. PG046, 17-04-2022 Lothow Pathar	Gundhua bon	Herb	Lv	Leaves are grinded and put on the affected area.	5 leaves	Cuts and Wounds
Bromeliaceae	*Ananas comosus* (L.) Merr. PG046, 22-05-2022 Ahom Gaon	Anarokh	Herb	Lv	Juice of the leaves is taken on an empty stomach for 3 days.	2tsp.	Thread worm
				Fr	Juice of the ripe fruit is taken.	½ cup	Indigestion & jaundice
Caricaceae	*Carica papaya* L. PG024, 17-07-2022 Bolama	Amita	Shrub	Fr	Flowers are fried with mustard oil and then taken orally.	15 flowers	Thread worm
				Fr	Ripe Fruits are grinded and applied to the face.	As much as you need	Reduce facial glow
				Fr	Fruits are eaten.	1 piece	Indigestion
				Lat	The latex should be applied to the affected area.	2-3 drops	Ringworm
Clusiaceae	*Garcinia cambogioides var. cambogioides* PG020, 26-04-2022 Bishnupur	Kuji thekera	Tree	Fr	Preserved the fruit by slicing into thin pieces and then drying under sun. The dry slices are cooked with red lentil and then taken orally.	2 pieces	Dysentery, gastritis & obesity
Combretaceae	*Terminalia chebula* Retz. PG034, 28-08-2022 Phukan Doloni	Hilikha	Tree	Fr	Fruits are eaten raw.	2 fruits	Constipation, thread worm, & indigestion
Commelinaceae	*Commelina africana* subsp. *africana* PG052, 31-07-2022 Kathal	Kona himolu	herb	St	Stem is squeezed. The Juice come out should be applied to the affected area.	1 drop	Eye sore
Crassulaceae	*Kalanchoe pinnata* (Lam.) Pers. PG015, 20-06-2022 Haribor Doloni	Dupor tenga	Herb	Lv	Sugar candy is soaked at night. In the morning, Leaves are grinded and mixed with the sugar candy and then taken orally.	3tsp.	Leucorrhoea & Urinary tract infection
				Lv	Juice of the leaves is taken orally.	2-3 leaves	Anuria
				Lv	Juice of the leaves is mixed with small amount of sugar and then taken orally.	9 leaves	Kidney Stone
				Lv	Leaves are grounded and applied to hairs.	3-4 leaves	Pediculosis
				Lv	Leaves are grinded and applied to the affected area.	2 leaves	Abscess
Cucurbitaceae	*Cucumis sativus* L. PG044, 19-05-2022 Haribor Naharani	Tiyoh	Creeping vine	Fr	Fruits are grinded and applied to the skin.	As much as you need	Reduce facial glow & Blemished skin
				Fr	Fruits are eaten (daily).	1 fruit	Stone disease
				Fr	Placed a slice of cucumber on closed eyes.	1 piece in each eye	Eye wrinkles
Cucurbitaceae	*Momordica charantia* L. PG065, 11-05-2022 Haribor Doloni	Tita kerela	Climbing herb	Lv	Juice of the leaves is taken and eaten on an empty stomach in the morning for a week.	3 leaves	Thread worm
				Lv	Juice of the leaves are boiled with little water and then taken orally.	3 leaves	Rheumatoid arthritis
				Fr	Juice of the fruit is taken orally.	25 ml	Diabetes
Dilleniaceae	*Dillenia indica* L. PG01, 07-04-2022 Haribor Doloni	Outenga	Tree	Pulp	Gelatinous pulp is used as shampoo in hairs.	One cup	Dandruff & Alopecia
				Fr	Fruits are placed under the bed in spring season can prevents small pox illness.	1 fruit	Small pox
				Fr	Fruits (fleshy sepals) are cooked with red lentil and then taken orally.	2 pieces	Diabetes & Indigestion
Euphorbiaceae	*Manihot esculenta* Crantz PG02, 28-04-2022 Haribor	Himolu alu	Woody shrub	Rt	Roots are boiled in water and consumed.	2 pieces	Leucorrhoea
Euphorbiaceae	*Ricinus communis* L. PG035, 14-08-2022 Naharbari	Era	Small shrub	Lv	Leaves are grinded and boiled with coconut oil. After cool down applied to the affected area.	3-4 leaves	Pain
Fabaceae	*Erythrina variegata* L. PG038, 22-05-2022 Ahom Gaon	Modar	Tree	Lv	Juice of the tender leaves is taken orally.	1 drops	Thread worm

Fabaceae	*Tamarindus indica* L. PG013, 04-04-2022 Haribor Naharani	Teteli	Tree	Fr	Fruits are eaten raw.	1 fruit	High blood pressure
Lamiaceae	*Clerodendrum glandulosum* Lindl. PG016, 03-07-2022 Majgaon	Nefafu	Shrub	Lv	Leaves are grinded with three cloves of raw garlic and tied to a bundle of banana leaves and heated on fire heat and then taken after cooling down.	3 leaves	High blood pressure
Lamiaceae	*Leucas aspera* (Willd.) Link PG061, 31-08-2022 Christan Basti	Durun	Herb	Bud	Juice of the bud is taken and used orally on the nose.	1 drop	Nose bleeding
				Lv	Leaves are cooked and then taken orally.	½ hand palm	Tonsillitis (during pain), Fever & Dyspepsia
				Lv	Juice of the leaves is placed on the nose.	Very small amount	Sinus infection
Lamiaceae	*Mentha spicata* L. PG032, 11-05-2022 Haribor Doloni	Podina	Herb	Lv	Leaves are grinded with raw mango and then taken orally.	10-12 leaves	Indigestion & Anorexia
				Lv	Juice of the leaves is mixed with honey and then taken orally.	2 tsp	Diarrhoea
				Lv	Juice of the leaf is mixed with the juice of lemon and then taken orally.	2 tsp from the mixture	Vomiting
Lamiaceae	*Ocimum tenuiflorum* L. PG037, 05-06-2022 Digh Pukhuri	Tulokhi	Shrub	Lv	Juice of the leaves is mixed with honey and then taken.	2 tsp from the mixture	Cold and Cough
				Lv	Leaves are grinded with Leucas aspera and then taken orally.	2 tsp from the mixture	Pneumonia
				Lv	Leaves are chewed. (OR) Juice of the leaves is used as gargle.	2-3 leaves Or As much as you need	Bad breath, Dental caries
Lamiaceae	*Pogostemon benghalensis* (Burm.f.) Kuntze PG021, 31-08-2022 Christan Basti	Hukloti	Shrub	Lv	Leaves are cooked and then taken.	½ hand palm	Swelling
Lamiaceae	*Vitex negundo* L. PG059, 26-04-2022 Bishnupur	Pochotia	Shrub or Small tree	Lv	The leaves are crushed and tied to a bundle of banana leaves and heated on fire heat and baked in the area of pain. (OR) Leaves are grinded and put on the affected area.	1 hand palm	Pain, Rheumatoid arthritis
				Lv	Juice of the leaves are boiled with water and used for bath after cooling down.	1 cup from the mixture	Skin disease
				Lv	Juice of the leaves is taken.	¼ cup.	Cough
				Lv	Juice of the leaves is boiled with water and used as gargle.	½ cup from the mixture	Neck pain and Cough
Lythraceae	*Lawsonia inermis* L. PG023, 03-07-2022 Majgaon	Jetuka	Shrub	Lv	Leaves are grounded with *Phyllanthus emblica* and applied to hairs.	1 hand palm	Premature grey of hair
				Lv	Leaves are grinded and applied to the affected area.	As much as you need	Nail disease, Toe crack, Skin disease
				Lv	Leaves are grinded and applied to hairs.	1 hand palm	High blood pressure
Malvaceae	*Corchorus capsularis* L. PG012, 20-06-2022 Haribor Doloni	Morapat	Shrub	Lv	Leaves are dried under sun and preserved (traditionally known as 'Hukuta'). It is cooked with powdered rice and then taken orally.	½ hand palm	Thread worm.
Malvaceae	*Hibiscus acetosella* Welw. ex Hiern. PG026, 11-08-2022 Haribor Naharani	Ranga tengamora	Shrub	Lv	Leaves are cooked and then taken orally.	½ hand palm	Dysentery, Diarrhoea & indigestion
Malvaceae	*Hibiscus rosa-sinensis* L. PG043, 28-08-2022 Phukan Doloni	Joba	Shrub	Lv	Leaves are grinded and applied to the hairs.	5-6 Leaves	Alopecia & Dandruff
				Lv	Leaves are grinded with the fruit of *Phyllanthus emblica* and the juice is applied to the hairs.	5-6 Leaves	Premature grey of hair
				Fr	Juice of the flower is taken.	2 tsp.	Irregular Menstruation
				Lv & Fr	Grounded leaves and flowers are applied to the affected area.	As much as you need	Cuts and Wounds

Malvaceae	*Hibiscus sabdariffa* L. PG07, 07-08-2022 Ujani Miri	Tenga mora	Shrub	Lv	Leaves are cooked and then taken orally.	1 hand palm	Dysentery, Diarrhoea, Loss of appetite, Indigestion & High blood pressure
Marsileaceae	*Marsilea minuta* L. PG08, 15-05-2022 Dikhamukhia	Pani tengesi	Creeping herb	Lv	Leaves are cooked with fish and then taken orally.	1 hand palm	Constipation & Anorexia
Meliaceae	*Azadirachta indica* A. Juss. PG048, 19-06-2022 Solmaria	Neem	Tree	Lv Lv Lv Lv Lv Lv	Leaves are boiled with water and used for bath. Juice of the raw leaves is consumed. Leaves are grounded and applied to the hairs. Leaves are fried with Mustard oil and then taken orally. Leaves are boiled with water and used as gargle after cooling down. Leaves are placed under the bed.	1 cup from the mixture 1 cup ½ hand palm ¼ hand palm ½ cup from the mixture Carry the leaves with branches	Scabies, Prickly heat Thread worm Pediculosis Diabetes, Small pox, Allergy Toothaches Small pox
Menispermaceae	*Tinospora cordifolia* (Willd.) Hook.f. & Thomson PG049. 08-07-2022 Haribor Naharani	Amorlota	Climbing vine	St	Stem is soaked at night. In the morning, water is used for drink.	1 piece	Pain.
Musaceae	*Musa balbisiana* Colla. PG010, 09-06-2022 Haribor Doloni	Bhim kol	Herb	Fr peel Inner St	Flowers are finely chopped and cooked with the meat of pigeon and then taken orally. Banana peels are dried in the sun and burnt in the fire and soaked in water. The water extract from there is used to wash hairs. Finely chopped and cooked and then taken orally.	½ bowl As much as you need ½ bowl	Low blood pressure Alopecia, Premature grey of hair, Dandruff Anaemia
Myrtaceae	*Psidium guajava* L. PG018, 04-04-2022 Haribor Doloni	Modhuriam	Tree	Lv Lv Lv Lv	The leaves are crushed and boiled with water and then taken orally. Juice of the raw leaves is taken orally. Leaves are chewed. Juice of the leaves are applied to the hairs and washed after drying.	2 leaves in a cup of water 2tsp 3 leaves As much as you need	Pain, Anaemia Dysentery, Diarrhoea Toothaches Premature grey of hairs
Myrtaceae	*Syzygium cumini* (L.) Skeels. PG031, 22-06-2022 Haribor Doloni	Kola jamu	Tree	Fr	Fruits are eaten raw.	7 fruits	Anaemia
Oxalidaceae	*Averrhoa carambola* L. PG058, 10-04-2022 Pahumora	Kordoi	Tree	Fr	Fruits are cooked and then taken orally.	1 fruit.	Jaundice
Oxalidaceae	*Oxalis corniculata* L. PG054, 03-07-2022 Majgaon	Tengesi	Creeping herb	Lv Lv Lv	Juice of the leaves is taken orally. Juice of the leaves is taken orally. Leaves are cooked and then taken orally.	½ cup. 5 tsp. ½ bowl	Dementia Stomach ache, Anorexia Dysentery, Diarrhoea
Phyllanthaceae	*Phyllanthus emblica* L. PG060, 29-05-2022 Khagari gaon	Amlakhi	Tree	Fr Fr Fr	Fruits are grinded and mixed with coconut oil and applied to the hairs. Fruits are eaten raw. Juice of the raw fruits is taken orally.	5-6 fruits 2 fruits 3 fruits	Alopecia, Premature grey of hairs Vomiting, Dyspepsia, Anorexia Loss of vision, Deficiency of Vitamin C
Piperaceae	*Piper betle* L. PG039, 08-05-2022 Bokanoi	Pan	Climbing vine	Lv	Leaves are grounded and applied to the hairs	3 leaves	Pediculosis
Piperaceae	*Piper nigrum* L. PG050, 24-04-2022 No.2 Sonapur	Jaluk	Climbing vine	Fr Fr	Fruits are grinded with *Syzygium aromaticum* and then applied on the affected area. The leaves of *Colocasia esculenta* are cooked and pepper powder is given there and then consumed.	1 fruit. No fixed dosage	Toothaches, Dental caries Body aches after having a baby

				Fr	Fruits are grounded with three front leaves and three flowers of *Leucas aspera* and then consumed in an empty stomach.	1 fruit	Dysmenorrhoea
				Fr	Local chicken is cooked with pepper and then taken orally.	2 tsp	Cold, Low blood pressure
Plantaginaceae	*Bacopa monnieri* (L.) Wettst. PG062, 10-07-2022 Gendhali	Brahmi	Herb	Lv	Leaves are cooked and then taken orally.	½ hand palm	Dementia and Nervous debility
Poaceae	*Cynodon dactylon* (L.) Pers. PG05, 12-06-2022 Lokampur	Dubori bon	Perennial creeping herb	Lv	The squeezed leaves put on the cut area.	10-15 leaves	Cuts and Wounds.
				Lv	Leaves are grinded with Turmeric and put on the affected area.	20 gm from the mixture	Alargi, Prickly heats.
				Lv	Juice of the leaves is taken orally.	1tsp.	Abnormal uterine bleeding, Menstrual cramps
Poaceae	*Saccharum officinarum* L. PG09, 08-05-2022 Bokanoi	Kuhiyar	Shrub	St	Juice of the stem is taken orally.	1 glass	Urinary tract infection, Jaundice, Anuria & Kindley stone
Polygonaceae	*Persicaria chinensis* (L.) H.Gross PG022, 29-05-2022 Khagori gaon	Madhuhuleng	Herb	Lv	Leaves are cooked with red lentil and then taken orally.	1 hand palm	Indigestion
Rosaceae	*Rosa* spp. PG047, 10-04-2022 Pahumora Ahom	Gulap	Shrub	Fr	Flowers are soaked at night and then the rose water is applied to eye in the morning.	1 flower	Eye irritation, reddish eyes
				Fr	Juice is placed on the nose.	1 drop	Headache
Rubiaceae	*Oldenlandia corymbosa* L. PG042, 19-06-2022 Solmaria	Bon jhaluk	Herb	Lv	Leaves are cooked with *Centella asiatica*, *Leucas aspera,* Fish, Black Pepper and Garlic and then taken.	½ hand palm	Indigestion
Rubiaceae	*Paederia foetida* L. PG041, 21-08-2022 Khanajan	Bhedailota	Climber herb	Lv	The leaves are crushed and mixed with rice powder and slowly adding water and make dough. After these, fried with Mustard oil and then taken orally.	½ hand palm	Diarrhoea, Dysentery
				Lv	Juice of the leaves is taken.	½ cup	Body pain
				Lv	Leaves are grinded with Allium sativum and then taken orally.	5-6 leaves (twice daily)	Rheumatoid arthritis
Rutaceae	*Citrus aurantiifolia* (Christm.) Swingle PG014, 10-04-2022 Pahumora	Gul nemu	Shrub	Sd	Juice of the seeds are mixed with little water and then consumed in an empty stomach.	3 seeds	Thread worm
				Fr	Bathing with the mixture of raw fruit juice and warm water.	1 cup from the mixture	Skin disease, Prickly heats, Bad odour
				Fr	Juice of the fruit is taken orally.	½ cup	High blood pressure, Pimples
				Fr	Fruits are kept in salt and stored for a few days and it is eaten when needed.	2 tsp.	Diarrhoea, Dysentery, Anorexia & Dyspepsia
				Fr	Juice of the fruit is applied to the eye after adding same amount of water.	1 drop	Eye irritation, Cataract, Reddish eyes
Rutaceae	*Citrus limon* (L.) Osbeck PG017, 07-08-2022 Ujani Miri	Kaji nemu	Shrub	Sd	Seeds are grinded and mixed with water and eaten on an empty stomach.	3 seeds	Thread worm
				Fr	Juice of the fruits are mixed with water and then taken.	1 cup from the mixture	Anorexia, Diarrhoea, Dysentery
				Fr	Juice of the fruits are mixed with water and used as gargle.	1 cup from the mixture	Bad breath
				Fr	Juice of the fruits are mixed with Mustard oil and small amount of salt and used as toothpaste.	2 drops	Tooth disease
Rutaceae	*Bergera koenigii* L. PG064, 15-05-2022 Dikhamukhia	Narasingha	Shrub	Lv	Leaves are chewed and eaten on an empty stomach.	2 leaves	Gastritis
				Lv	Juice of the raw leaf is taken orally.	2 tsp.	Abdominal gripes
				Lv	Leaves are cooked and then soup is taken orally.	½ cup.	Diabetes
				Lv	Leaves are boiled with Coconut oil and after cooling down it is applied to the hairs.	5-6 leaves	Alopecia, Premature grey of hair, Dandruff

Sapotaceae	*Mimusops elengi* L. PG033, 24-04-2022 No.2 Sonapur	Bokul	Tree	Br	Juice of the bark are mixed with water and used as gargle.	1 cup from the mixture	Toothache, Pyorrhoea, Dental caries
				Fr	Dry flowers are sniffed with noses.	3 flowers	Headache
Saururaceae	*Houttuynia cordata* Thunb. PG055, 21-08-2022 Khanajan	Machandari	Herb	Lv	Leaves are cooked and then taken orally.	1 hand palm	Dysentery, Diarrhoea, Indigestion, Anorexia, Abdominal gripes
Solanaceae	*Cestrum nocturnum* L. PG045, 10-07-2022 Gendhali	Xewali	Tree	Fr	Flowers are fried with Mustard oil and then taken orally.	½ hand palm	Thread worm & Fever
				Lv or Sd	Leaf or seed is grinded and applied to the affected area.	5-6 leaves or seeds.	Alopecia
Solanaceae	*Solanum lycopersicum* L. PG03, 04-04-2022 Haribor Naharani	Bilahi	Herb	Fr	Juice of the fruits are mixed with small amount of black pepper powder and salt and eaten on an empty stomach.	½ cup.	Thread worm
				Fr	Ripen fruits are grinded and applied to the face.	As much as you need	Reduce facial glow, Acne or Pimples
Vitaceae	*Cissus quadrangularis* L. PG011, 12-06-2022 Lokampur	Harjura lota	Creeping herb	St	Creeper part is grinded and put on the affected area.	As much as you need	Fractured bone
Zingiberaceae	*Curcuma caesia* Roxb. PG019, 14-08-2022 Rahali Gaon	Kola halodhi	Herb	Rz	Juice of the rhizome is put on the affected area.	2 drops	Toothache
				Rz	Rhizomes are grinded and applied to the affected area.	1 rhizome	Skin disease, Pain
Zingiberaceae	*Curcuma longa* L. PG027, 01-05-2022 No.1 Pukhuri Paria	Halodhi	Herb	Rz	Rhizomes are grinded and mixed with milk and eaten before bedtime.	1 cup from the mixture	Body pain
				Rz	A little salt is mixed with Turmeric juice and eaten on an empty stomach.	2 tsp (7 days)	Thread worm
				Rz	Juice of rhizomes are applied on the affected skin.	As much as you need	Acne or Pimples, Reduce facial glow
				Rz	Rhizomes are grinded with *Cynodon dactylon* and the juice is taken.	3 tsp from the mixture	Leucorrhoea
				Rz	Rhizomes are grinded with *Azadirachta indica* and applied to the affected area.	As much as you need	Skin disease
				Rz	Rhizome is chewed.	1 piece	Cavity
Zingiberaceae	*Zingiber officinale* Roscoe. PG030, 11-08-2022 Naharbari	Ada	Herb	Rz	Rhizomes are grinded with *Ocimum sanctum* and mixed with honey and then taken orally.	2 tsp from the mixture	Cold and Cough
				Rz	Juice of the rhizomes is taken.	2 tsp.	Vomiting, Dyspepsia
				Rz	Rhizome is grinded and put on the affected area.	As much as you need	Toothaches

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