



Comparative Ethnobotanical Study of Medicinal Plants in North and West Garo Hills, Meghalaya, India

Tengchuma Sangma¹, Nikjame Ch. Sangma², Sangeeta Sarma^{3*}

^{1,2} Department of Botany, Assam Don Bosco University, Tapesia, Sonapur-782402, Assam, India

³ Department of Botany, Jagiroad College (Autonomous), Jagiroad, Morigaon-782410, Assam, India

Corresponding author: sangeeta.sarma8@gmail.com

Abstract

This study documented and compared ethnomedicinal plants used by indigenous communities in Tikrikilla (West Garo Hills) and Rongbu (North Garo Hills), Meghalaya, India. Field surveys, questionnaires, and interviews with villagers, elders, and traditional healers were conducted, followed by plant collection and identification. A total of 110 medicinal plant species were recorded: 32 species belonging to 25 families in West Garo Hills and 78 species belonging to 44 families in North Garo Hills. Shrubs were the dominant growth form in both districts with 37.5% of species in West Garo Hills and 35.89% in North Garo Hills, while leaves were the most frequently used plant part with 59.37% used in West Garo Hills and 51.28% in North Garo Hills. Plants were mainly prepared as decoctions, juices, pastes, or used raw mainly to treat gastrointestinal disorders, followed by fever, skin diseases, and other ailments. Several species were commonly shared between the sites, while others were location-specific, reflecting differences in biodiversity and traditional practices. The study highlights the rich ethnomedicinal knowledge of the Garo communities and emphasizes the need for documentation, conservation, and further pharmacological investigation of traditionally used medicinal plants.

Keywords: *Ethnomedicine, medicinal plants, Garo Hills, indigenous knowledge, conservation, Meghalaya.*

Introduction

Ethnobotany, first coined by Harshberger in 1895, explores the practical uses of plants within cultural contexts. Indigenous knowledge systems have historically guided the discovery of medicinal plants, forming the basis of traditional medicine worldwide. The World Health Organization estimates that nearly 80% of the global population relies on traditional medicine for primary healthcare [1].

India, with over 427 tribal communities, harbours more than 5,000 medicinal plant species, many of which are used in Ayurveda, Unani, and folk medicine [2].

The Hindu Kush–Himalayan belt, including Meghalaya, is recognized for its biodiversity and traditional medicine systems [3].

Previous ethnobotanical surveys in Northeast India have documented medicinal plants among the Jaintia tribes [4], Reang tribe of Tripura [5], and Zeliangrong ethnic group of Manipur [6].

In Meghalaya, Dolui et al. [7] recorded 46 herbal remedies, while Singh et al. [8] documented 157 species used by the Garo tribes. However, comparative studies across different districts of the Garo Hills remain limited. This paper synthesizes two independent surveys from West and North Garo Hills, aiming to highlight overlaps, unique species, and broader implications for conservation and pharmacological research.

Materials and Methods

Study Sites

West Garo Hills (Tikrikilla block): The Tikrikilla block of West Garo Hills district (25.5679°N, 90.2245°E) lies in the western part of Meghalaya, bordering Assam. The landscape is characterized by undulating hills interspersed with plains, patches of secondary forest, and agricultural fields. The climate is humid subtropical,

with high rainfall during the monsoon season and moderate temperatures throughout the year. Villages in this block are predominantly inhabited by the Garo tribe, who maintain close cultural ties with their natural environment. Traditional healers, locally known as Ojhas, play a central role in preserving and transmitting ethnomedicinal knowledge. Subsistence farming, fishing, and forest resource collection are the main livelihoods, and medicinal plants are often gathered from nearby forests, homestead gardens, and fallow lands.

North Garo Hills (Rongbu village, Kharkutta block): Rongbu village in Kharkutta block (25.55°N, 90.31°E) is situated in the northernmost part of the Garo Hills, adjoining Assam. The terrain is gently rolling, with mixed vegetation ranging from moist deciduous forest patches to cultivated lands. The population is ethnically diverse, comprising Garo tribes along with Rabhas, Hajongs, Kacharis, and Boros. This cultural mosaic enriches the ethnobotanical practices of the region, as different communities contribute distinct knowledge systems regarding plant use. The area experiences a humid climate with abundant rainfall, supporting a wide variety of medicinal flora. Local healers and elders are custodians of traditional remedies, which are widely employed for primary healthcare in the absence of easily accessible modern medical facilities.

Data Collection

Study was conducted in one village each from North and West Garo Hills from October 2021 to November 2021. Structured questionnaires and group interviews were conducted with villagers, elders, and traditional healers (“Ojhas”). In North Garo Hills, information was recorded from a total of 37 people from the age group of 31-82 of which 23 were male and 14 were female. 4 traditional healers assisted in the survey. In West Garo Hills, information was recorded from a total of 30 people from the age group of 37-77 of which 21 were male and 9 were female. 2 traditional healers assisted in the survey. Informants were selected by random sampling. Information recorded included local names, plant parts used, preparation methods, and ailments treated. Specimens were photographed and identified using herbarium references of the Department of Botany, Gauhati University.

Results

Species Richness and Diversity

Across the two study sites, a total of 110 medicinal plant species were documented. In the West Garo Hills (Tikrikilla block), 32 species belonging to 25 families were recorded (Fig. 1A), whereas the North Garo Hills (Rongbu village) recorded 78 species distributed across 44 families (Fig. 1A). The species richness in North Garo Hills was more than twice that of West Garo Hills, a pattern that reflects greater habitat heterogeneity and wider community participation in the ethnobotanical survey.

Growth Form Distribution

Shrubs were the dominant growth form in both districts, accounting for 37.5% of species in West Garo Hills and 35.89% in North Garo Hills. Trees contributed 31.25% in West Garo Hills and 29.48% in North Garo Hills. Herbs were less represented in West and North Garo Hills (21.87% and 19.23% respectively), while climbers were minor components (Fig 1B). This pattern suggests that woody perennials are the primary source of ethnomedicinal remedies in the region.

Plant Parts Utilized

Leaves were the most frequently used plant part in both districts, accounting for 59.37% in West Garo Hills and 51.28% in North Garo Hills (Fig 1C). Bark and roots were secondary sources, while fruits, seeds, and flowers were less commonly employed. However, fruits were utilized more frequently in North Garo Hills than in West Garo Hills. The predominance of leaves reflects both accessibility and sustainability of harvesting practices.

Ailments Treated

The majority of remedies targeted gastrointestinal disorders (diarrhoea, dysentery, gastric pain), followed by fevers, skin diseases, and respiratory problems. In West Garo Hills, gastrointestinal ailments accounted for 28.12% of recorded uses, while fevers and headaches were also prominent (Fig 1D).

In North Garo Hills, gastrointestinal ailments represented 19.23%, with a broader spectrum including diabetes, hypertension, and wound healing (Fig 1D).

Species Overlap and Uniqueness

Shared species: *Azadirachta indica*, *Psidium guajava*, *Bauhinia variegata*, *Calotropis gigantea*, *Hibiscus rosa-sinensis*, among others. These species are culturally entrenched and widely recognized for antimicrobial, antiinflammatory, and gastrointestinal properties. *Psidium guajava*, *Bauhinia variegata* can also treat hypertension.

Unique to West Garo Hills: *Swertia chirayita* and *Rauvolfia serpentina* possess antimalarial and antidiabetic properties.

Unique to North Garo Hills: *Catharanthus roseus* possess anticancer alkaloids, *Mikania micrantha* is used for wound healing, *Reinwardtia indica* Dumort. can treat jaundice. *Phlogacanthus thyrsoiflorus* have anti-diabetic properties, *Clerodendrum glandulosum* possess anti-hypertensive properties.

Preparation and Administration

Oral remedies: Decoctions, juices, and raw consumption of leaves and fruits were most common.

Topical remedies: Pastes and warmed leaves applied to wounds, swellings, or skin infections.

Specialized practices: For example, *Senna alata* leaves were crushed and applied for ringworm, while *Citrus limon* juice mixed with salt was consumed for diarrhoea. Fig 1 shows a comparative ethnobotanical analysis of medicinal plants documented in West and North Garo Hills. A checklist of ethno-medicinal plants used in West and North Garo Hills is given in Table 1. Fig 2 and 3 display some medicinal plants of North and West Garo Hills respectively in their natural habitat.

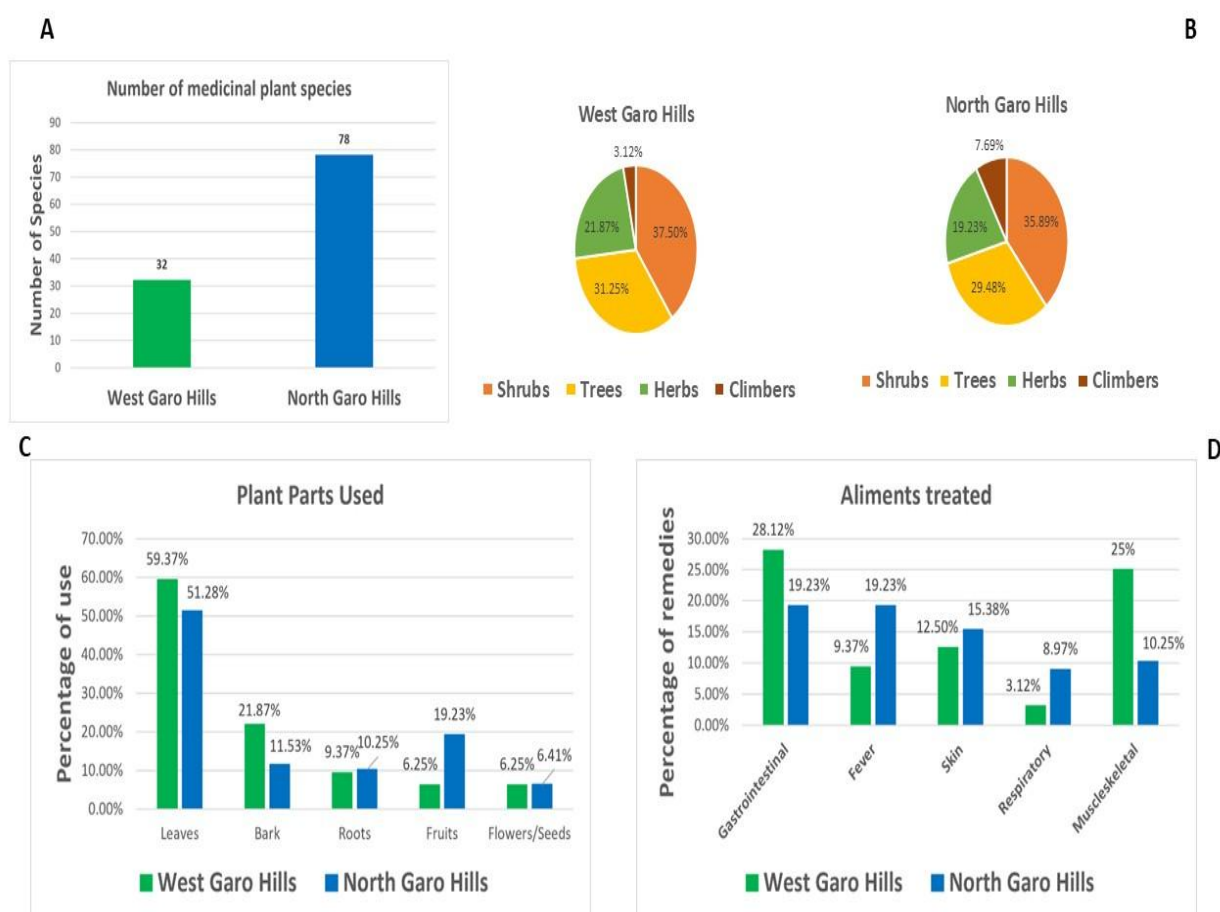


Fig 1: Comparative ethnobotanical analysis of medicinal plants documented in West and North Garo Hills, Meghalaya, India. (A) Number of species recorded in each district (West Garo Hills = 32; North Garo Hills = 78). (B) Growth form distribution showing proportions of shrubs, trees, herbs, climbers, and grasses. (C) Plant parts most frequently used in remedies, highlighting the predominance of leaves in both districts. (D) Categories of ailments treated, with gastrointestinal disorders as the most common in both sites. Data are presented as percentages of total species or remedies recorded

Table 1: Checklist of medicinal plants used in North and West Garo Hills

SL No.	Botanical Name	Local Name	Family	Habitat	Parts Used	Diseases	Region
1	<i>Ananas comosus</i> (L.) Merr.	Anaros	Bromiliaceae	Shrub	Leaves	Pinworms	North Garo Hills
2	<i>Azadirachta indica</i> A.Juss	Neem	Meliaceae	Tree	Leaves	Skin allergic	
3	<i>Bauhinia variegata</i> L.	Me'gong	Fabaceae	Tree	Leaves	Blood pressure	
4	<i>Cinnamomum tamala</i> (Buch.-Ham.) T.Nees & C.H.Eberm.	Tejpat	Lauraceae	Tree	Leaves, bark	Cough, Colds, Jaundice	
5	<i>Hydrocotyle sibthorpioides</i> Lam.	Manamuni	Apiaceae	Creeper	Leaves	High blood pressure	
6	<i>Justicia gendarussa</i> Burm.f.	Dosajabe	Acanthaceae	Shrub	Leaves	Swollen body	
7	<i>Mikania micrantha</i> Kunth	Repuji budu	Asteraceae	Climber	Leaves	Wound healing	
8	<i>Aerides rosea</i> Lodd. ex Lindl. & Paxton	Balgitdo	Orchidaceae	Epiphytes	Leaves	Wound healing	
9	<i>Ocimum tenuiflorum</i> L.	Tulsi	Lamiaceae	Herb	Leaves	Cough, colds.	
10	<i>Piper betel</i> L.	Pan	Piperaceae	Climber	Leaves	Dysentery, breathing difficult,	
11	<i>Clerodendrum glandulosum</i> Lindl.	Donggam	Verbenaceae	Tree	Leaves	Blood pressure	
12	<i>Leucas aspera</i> (Willd.) Link	Dimiku	Lamiaceae	Herb	Leaves	Nose bleeding, cold.	
13	<i>Mimosa pudica</i> L.	Tusidumu	Mimosaceae	Herb	Leaves	Skin diseases, Insomnia (for kids)	
14	<i>Musa × paradisiaca</i> L.	Terik	Musaceae	Herb	Leaves	Constipation	
15	<i>Sida acuta</i> Burm.f.	Chirota	Malvaceae	Herb	Leaves	Malaria	
16	<i>Tamarindus indica</i> L.	Cheng	Fabaceae	Tree	Leaves	Caterpillar rashes	
17	<i>Psidium guajava</i> L.	Komperam	Myrtaceae	Tree	Leaves	High pressure	
18	<i>Reinwardtia indica</i> Dumort.	Kobu	Linaceae	Shrub	Leaves	Jaundice	
19	<i>Cyathula prostrata</i> (L.) Blume	Memang atchili	Amaranthaceae	Herb	Leaves	Cough	
20	<i>Celosia spicata</i> Barr & Sugden	Do'gingmat	Amaranthaceae	Shrub	Leaves	Nose bleeding	
21	<i>Drynaria quercifolia</i> (L.) J.Sm.	Chelwat	Polypodiaceae	Epiphytes	Leaves, Root	Chest pain, Pain while urination (dysuria)	
22	<i>Clerodendrum infortunatum</i> L.	Sam siko	Lamiaceae	Shrub	Leaves	Skin diseases	
23	<i>Blumea balsamifera</i> (L.) DC.	Kimpra	Asteraceae	Shrub	Leaves	Body swelling	

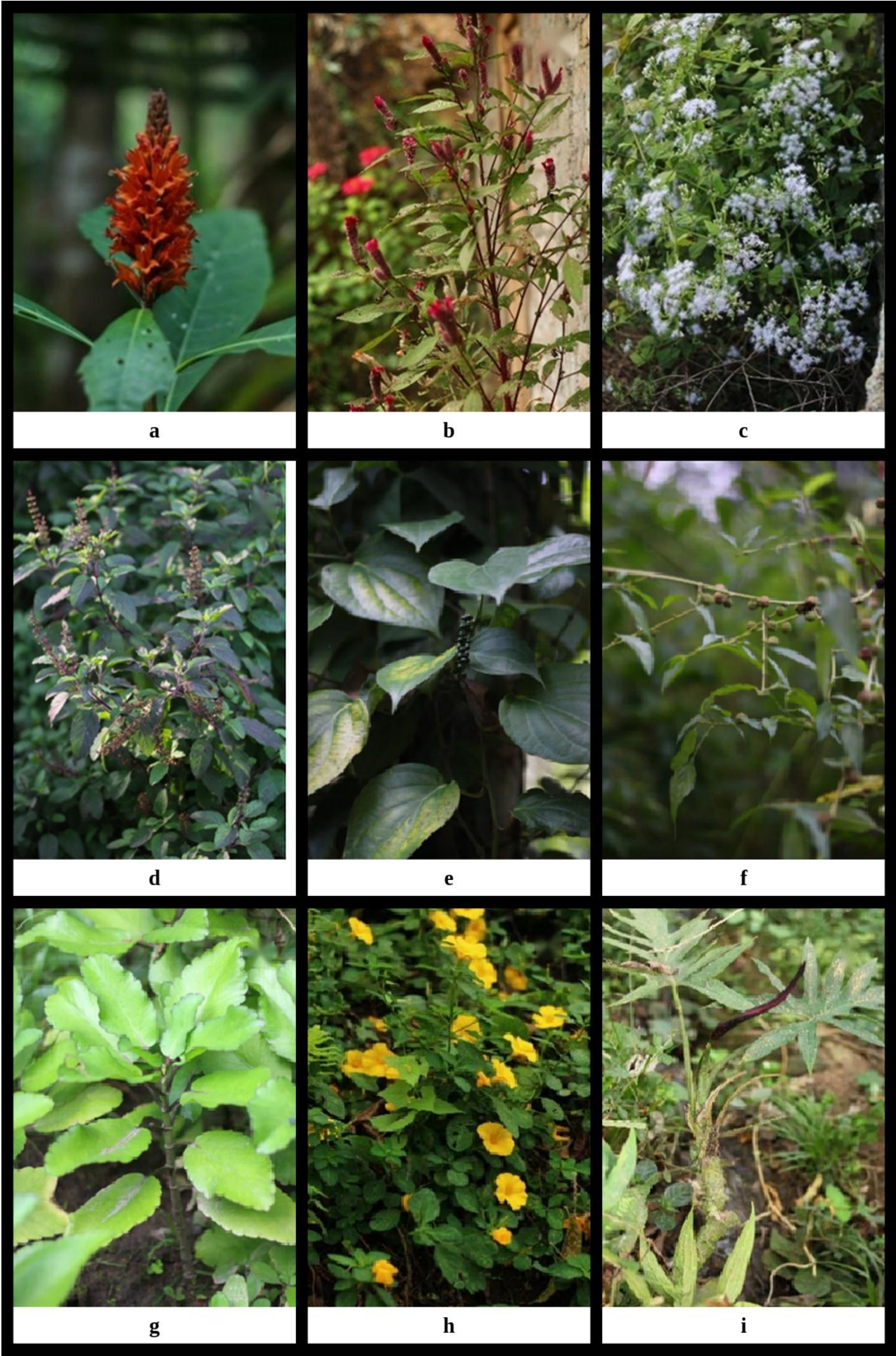
24	<i>Tagetes erecta</i> L.	Genda	Asteraceae	Shrub	Leaves	Wound healing	North Garo Hills
25	<i>Kalanchoe pinnata</i> (Lam.) Pers.	Walkam dalgipa	Crassulaceae	Herb	Leaves	Beginning stage of gold stone	
26	<i>Antidesma acidum</i> Retz.	Arobak	Euphorbiaceae	Tree	Leaves	For body swelling, chest pain	
27	<i>Catharanthus roseus</i> (L.) G.Don	Gitding pul	Apocynaceae	Shrub	Leaves	For pressure, diabetes	
28	<i>Datura metel</i> L.	Akora	Solanaceae	Shrub	Leaves	Mental disorders	
29	<i>Tectona grandis</i> L.f.	Segun	Lamiaceae	Tree	Leaves	Diarrhoea, dysentery	
30	<i>Alternanthera dentata</i> Stuchlik ex R.E.Fr.	Sam marang	Amaranthaceae	Herb	Leaves	Wound	
31	<i>Senna alata</i> (L.) Roxb.	Dadi mildang	Poaceae	Shrub	Leaves	Ringworm	
32	<i>Dieffenbachia seguine</i> (Jacq.) Schott	Kongrok kongtok	Araceae	Herb	Leaves	Epidermal parasitic skin diseases	
33	<i>Cynodon dactylon</i> (L.) Pers.	Sam kniding	Poaceae	Grass	Leaves	Toothache	
34	<i>Hibiscus x rosa-sinensis</i> L.	Jova	Malvaceae	Shrub	Leaves, flower	Allergic, stomach ache	
35	<i>Artocarpus heterophyllus</i> Lam.	Tebrong	Moraceae	Tree	Leaves	High pressure	
36	<i>Calotropis gigantea</i> (L.) W.T. Aiton	Memang tebrong	Apocynaceae	Shrub	Leaves	Dislocated leg, hands and body swelling	
37	<i>Abelmoschus esculentus</i> (L.) Moench	Dorai	Malvaceae	Shrub	Fruit	Constipation	
38	<i>Aegle marmelos</i> (L.) Corrêa	Sepri	Rutaceae	Tree	Fruit,	Diarrhoea	
39	<i>Annona squamosa</i> L.	Atabol	Anonaceae	Tree	Fruit	Cancer	
40	<i>Averrhoa carambola</i> L.	Galde	Oxalidaceae	Tree	Fruit, Leaves	Fever, bites of insects	
41	<i>Capsicum frutescens</i> L.	Jalik miski	Solanaceae	Shrub	Fruit	Snake bite	
42	<i>Citrus × limon</i> (L.) Osbeck	Gakji	Rutaceae	Tree	Fruit, Leaves	Cough, colds, stomach ache, kidney stones and body swollen	
43	<i>Cucumis sativus</i> L.	Temit	Cucurbitaceae	Climber	Fruit	Skin infection, reduce internal swelling	

44	<i>Emblica officinalis</i> Gaertn.	Ambare segun	Euphorbiaceae	Tree	Fruit	Indigestion, ulcers, diabetes, asthma	North Garo Hills
45	<i>Hibiscus sabdariffa</i> L.	Galda	Malvaceae	Shrub	Fruit, Leaves	Indigestion	
46	<i>Momordica charantia</i> L.	Kangkuneng	Cucurbitaceae	Climber	Fruit	Diabetes	
47	<i>Oroxylum indicum</i> (L.) Kurz	Kering	Bignoniaceae	Tree	Fruit, Leaves	Jaundice	
48	<i>Piper longum</i> L.	Gulmoris	Piperaceae	Climber	Fruit	Cough, colds, sore throat	North Garo Hills
49	<i>Solanum melongena</i> L.	Baring	Solanaceae	Shrub	Fruit	Relieves from arthritis and joint pain	
50	<i>Solanum indicum</i> L.	Kimka	Solanaceae	Shrub	Fruit, root	Blood purification, asthma	
51	<i>Punica granatum</i> L.	Dalim	Lythraceae	Shrub	Fruit, flower	Jaundice, diarrhoea, nose bleeding	
52	<i>Sterculia villosa</i> Roxb. ex Sm.	Olmak	Sterculiaceae	Tree	Stem/Bark	Urinary tract pain, Urinary pain	
53	<i>Solanum khasianum</i> C.B. Clarke	Baring mikking	Solanaceae	Shrub	Seed	Toothache	
54	<i>Corchorus capsularis</i> L.	Mekka	Malvaceae	Shrub	Seed	Piles	
55	<i>Zingiber officinale</i> Roscoe	Eching	Zingeberaceae	Herb	Rhizome	Toothache, cough, Sore throat	
56	<i>Curcuma domestica</i> Valetton	Holdi	Zingeberaceae	Herb	Rhizome	Cuts, wounds	
57	<i>Jatropha curcas</i> L.	Banglagas	Euphorbiaceae	Shrub	Latex	Boiled, scores, ulcers and herpes	
58	<i>Codiaeum variegatum</i> (L.)	Dobal pul	Euphorbiaceae	Shrub	Latex	Tinea versicolor	
59	<i>Allium cepa</i> L.	Rasin gitchak	Amaryllidaceae	Herb	Tuber	Snake bite	
60	<i>Dioscorea alata</i> L.	Tamilang	Dioscoreaceae	Climber	Tuber	Abortion	
61	<i>Amorphophallus bulbifer</i> (Schott) Blume	Songrura	Araceae	Shrub	Tuber	Snake bite	
62	<i>Allium sativum</i> L.	Rasin gipbok	Amaryllidaceae	Herb	Tuber	Cough, fever and colds	
63	<i>Morus alba</i> L.	Muskuri	Moraceae	Tree	Root	Cough, colds	

64	<i>Thysanolaena latifolia</i> (Roxb. ex Hornem.) Honda	Simmu	Poaceae	Grass	Root	Fever	North Garo Hills
65	<i>Holmskioldia sanguinea</i> Retz.	Mese nachil	Lamiaceae	Shrub	Root	Gastric, goldstone	
66	<i>Carica papaya</i> L.	Modipol	Caricaceae	Tree	Root	Dog bite	
67	<i>Cissus quadrangularis</i> L.	Jakritch	Vitaceae	Epiphyte	Whole plant	Bones fractures.	
68	<i>Iresine herbstii</i> Hook.	Chandile dalgipa	Amaranthaceae	Herb	Whole plant	Nose bleeding, throat bleeding	
69	<i>Eichhornia crassipes</i> (Mart.) Solms	Garabokchi	Pontederiaceae	Herb (aquatic)	Whole plant	Blood disorder	
70	<i>Cassia fistula</i> L.	Snaru	Fabaceae	Tree	Bark	Stomach ache	
71	<i>Moringa oleifera</i> Lam.	Sojona	Moringaceae	Tree	Bark	Dog bite	
72	<i>Ziziphus jujuba</i> Mill.	Kangkil	Rhamnaceae	Tree	Bark	Cough, colds, tuberculosis	
73	<i>Lasia spinosa</i> (L.) Thwaites	Bakgagong	Araceae	Shrub	Bark	Dizziness	
74	<i>Cheilocostus speciosus</i> (J. Koenig) C.D. Specht	Gogarek	Costaceae	Shrub	Bark	Urinary pain	
75	<i>Aquilaria malaccensis</i> Lam.	Agor	Thymelaeaceae	Tree	Bark	Where splinter is stuck	
76	<i>Litchi chinensis</i> Sonn.	Letchu	Sapindaceae	Tree	Bark, Flower, root	Throat problem	
77	<i>Cajanus cajan</i> (L.) Huth	Randu	Fabaceae	Shrub	Flower, Fruit, root	Jaundice	
78	<i>Phlogacanthus thyrsiflorus</i> (Roxb) Nees.	Kimchit	Acanthaceae	Shrub	Flower	Blood sugar	
79	<i>Abutilon indicum</i> (L.) Sweet	Hatgopali	Malvaceae	Shrub	Leaves	Migraine	
80	<i>Adiantum cordatum</i> Maxon	Me.mang araru	Pteridaceae	Fern	Leaves	Epilepsy	
81	<i>Aegle marmelos</i> (L.) Corrêa	Chempri/Selpri	Rutaceae	Tree	Leaves, Bark	Urine infection, Stomach Pain	
82	<i>Aquilaria malaccensis</i> Lam.	Agor	Thymelaeaceae	Tree	Leaves, Bark	Abdominal problems, Used during childbirth, Gastric	
83	<i>Azadirachta indica</i> A.Juss	Neem	Meliaceae	Tree	Leaves, Bark	High fever, Diabetes, Toothache	

84	<i>Bauhinia variegata</i> L.	Megong	Fabaceae	Tree	Leaves, Bark	Blood pressure, Diarrhoea, Vomiting	West Garo Hills
85	<i>Bryophyllum pinnatum</i> (Lam.) Oken	Pator Chira	Crassulaceae	Herb	Leaves	Gallstones, An.dime(A female disease after delivery), Inflammation	
86	<i>Calotropis gigantea</i> (L.) W.T.Aiton	Sengrip/Akkon	Apocyanaceae	Shrub	Leaves	Joint Pains, Headache, Hearing problems	
87	<i>Cassia fistula</i> L.	Sinaru	Fabaceae	Tree	Bark	Jaundice, Ulcers	
88	<i>Cordyline fruticosa</i> (L.) A.Chev.	Rawa gitckak	Asparagaceae	Shrub	Leaves	Menstrual disorder, Bleeding gums	
89	<i>Epiphyllum oxypetalum</i> (DC.) Haw.	Bethlehem	Cactaceae	Shrub	Leaves	Wound healing, Fracture	
90	<i>Houttuynia cordata</i> Thunb	Matchaduri	Saururaceae	Herb	Leaves	Pressure, Fever, Anaemia	
91	<i>Justicia gendarussa</i> Burm.f.	Dojagipe	Acanthaceae	Shrub	Leaves	Sprain, Fracture,	West Garo Hills
92	<i>Lantana camara</i> L.	Santana	Verbenaceae	Shrub	Leaves	Muscle cramps, Skin diseases	
93	<i>Litsea monopetala</i> (Roxb.) Pers.	Adambit	Lauraceae	Tree	Bark	Cancer, Skin diseases	
94	<i>Pothos scandens</i> L.	Chambil jakchang	Araceae	Climber	Leaves	Gastric, Muscle cramps, Diarrhoea	
95	<i>Psidium guajava</i> L.	Komperam	Myrtaceae	Tree	Leaves	Diarrhoea, Dysentery, Vomiting, Toothache, Cough	
96	<i>Ricinus communis</i> L.	Koronda	Euphorbiaceae	Shrub	Leaves	Nose bleed, Skin diseases, Muscles aches	

97	<i>Senna alata</i> (L.) Roxb.	Katri bol	Fabaceae	Shrub	Leaves	Ringworm and other skin infections	West Garo Hills
98	<i>Swertia chirayita</i> (Roxb.) H.Karst.	Samkuchok/ Chirota	Gentianaceae	Herb	Leaves	Malaria, Black fever, Eye diseases, Diabetes, Fever	
99	<i>Tradescantia spathacea</i> Sw.	Sakal gitchak	Commelinaceae	Herb	Leaves	Menstrual disorder, An.dime	
100	<i>Vitex peduncularis</i> Wall. ex Schauer	Silangri	Lamiaceae	Tree	Bark	Urine infection, Asthma, Anaemia, Malarial fever	
101	<i>Citrus × limon</i> (L.) Osbeck	Kakji	Rutaceae	Tree	Fruit	Diarrhoea, Vomiting	
102	<i>Cheilocostus speciosus</i> (J. Koenig) C.D. Specht	Gokgarek	Costaceae	Herb	Rhizome	Fever, Stomach pain, Blisters	
103	<i>Chromolaena odorata</i> (L.) R.M.King & H.Rob.	Sambangguri	Asteraceae	Shrub	Root	Abdominal pain, Poisoning	
104	<i>Corchorus capsularis</i> L.	Meka	Malvaceae	Shrub	Seed	Epilepsy, Piles	West Garo Hills
105	<i>Drynaria quercifolia</i> (L.) J.Sm.	Dorenggrang	Polypodiaceae	Fern	Rhizome	Fractures, Chest pain, Neck swelling	
106	<i>Hibiscus x rosa-sinensis</i> L.	Joba	Malvaceae	Shrub	Flower	Anaemia, Gastric	
107	<i>Mimosa pudica</i> L.	Sammikchip	Fabaceae	Herb/ Weed	Root	Toothache, Snake bites, Diarrhoea	
108	<i>Phyllanthus emblica</i> L.	Ambare	Phyllanthaceae	Tree	Fruit	Gastric, Cavity	West Garo Hills
109	<i>Rauvolfia serpentina</i> (L.) Benth. ex Kurz	Dogrikme	Apocyanaceae	Shrub	Root	Fever, Diarrhoea, Vomiting, Malaria, Pneumonia, Gastric	
110	<i>Zingiber officinale</i> Roscoe	Eching	Zingiberaceae	Herb	Rhizome	Headache, Dizziness, Joint pain, Cough, Cramps	



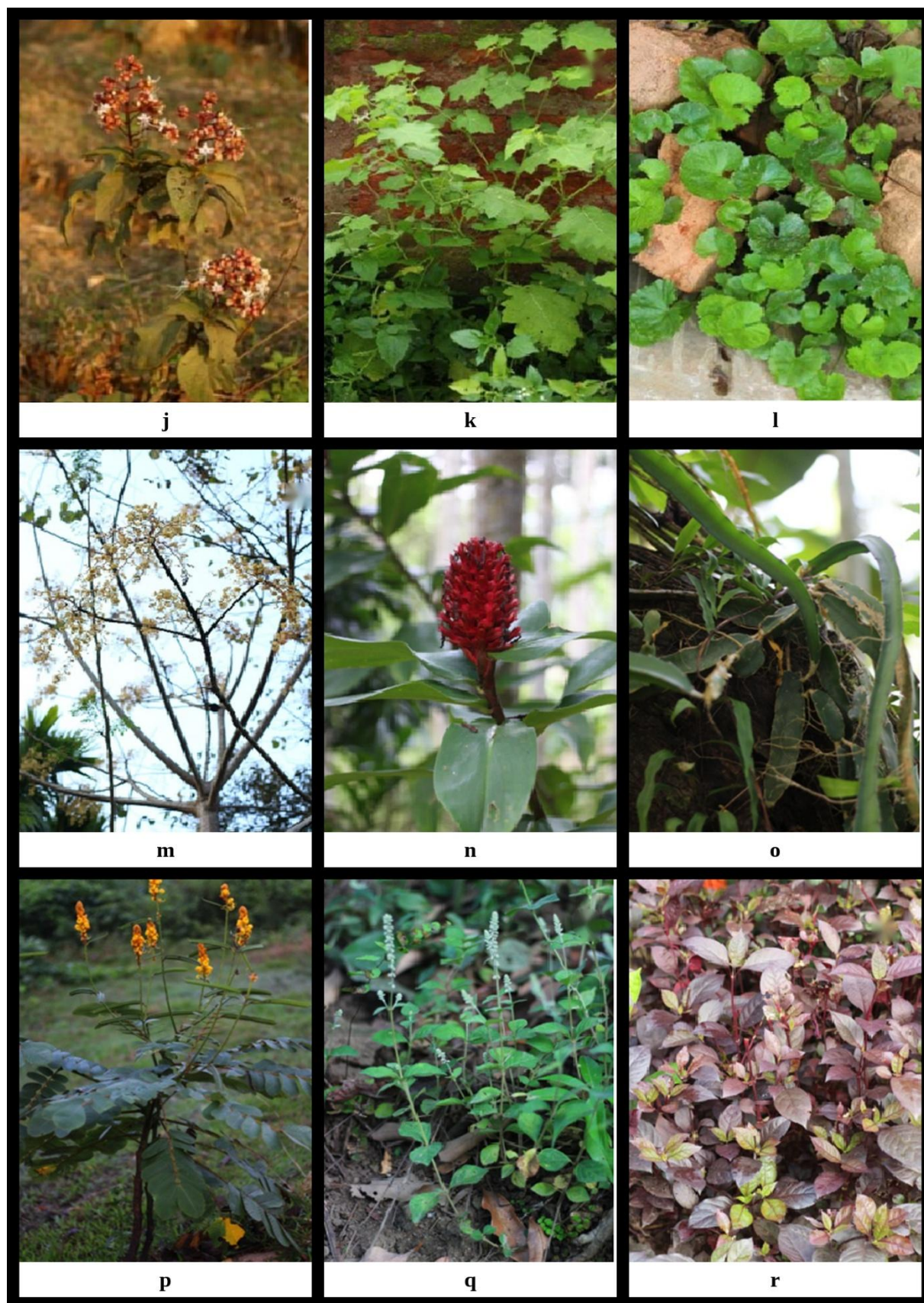


Fig.2. Some medicinal plants found in North Garo Hills: a. *Phlogacanthus thyrsiflorus* (Roxb.) Nees; b. *Celosia spicata* Barr. & Sugden; c. *Chromolaena odorata* (L.) R.M.King & H.Rob.; d. *Ocimum tenuiflorum* L.; e. *Piper longum* L.; f. *Corchorus capsularis* L.; g. *Bryophyllum pinnatum* (Lam.) Oken; h. *Reinwardtia indica* Dumort.; i. *Lasia spinosa* (L.) Thwaites; j. *Clerodendrum infortunatum* L.; k. *Solanum khasianum* C.B. Clarke; l. *Hydrocotyle sibthorpioides* Lam.; m. *Sterculia villosa* Roxb. ex Sm.; n. *Cheilocostus speciosus* (J.Koenig) C.D. Specht; o. *Cissus quadrangularis* L.; p. *Senna alata* (L.) Roxb.; q. *Cyathula prostrata* (L.) Blume; r. *Alternanthera dentata* Stuebel ex R.E. Fr.

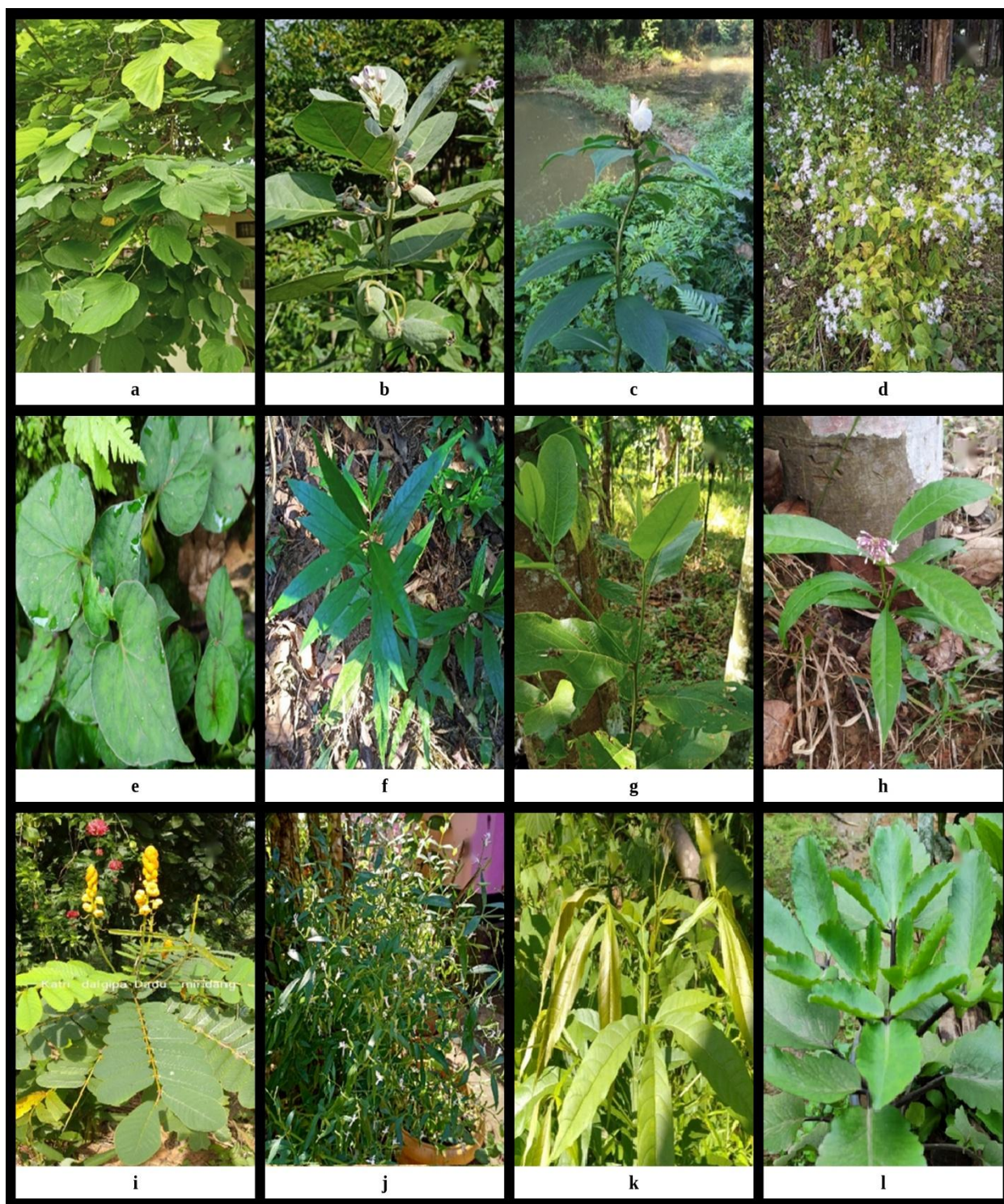


Fig.3. Some medicinal plants found in West Garo Hills: a. *Bauhinia variegata* L.; b. *Calotropis gigantea* (L.) W.T.Aiton; c. *Cheilocostus speciosus* (J.Koenig) C.D.Specht; d. *Chromolaena odorata* (L.) R.M.King & H.Rob.; e. *Houttuynia cordata* Thunb.; f. *Justicia gendarussa* Burm.f.; g. *Litsea monopetala* (Roxb.) Pers.; h. *Rauvolfia serpentina* (L.) Benth. ex Kurz; i. *Senna alata* (L.) Roxb.; j. *Swertia chirayita* (Roxb.) H.Karst.; k. *Vitex peduncularis* Wall. ex Schauer; l. *Bryophyllum pinnatum* (Lam.) Oken.

Discussion

The comparative study of medicinal plants in West (32 species) and North Garo Hills (78 species) highlights ecological diversity and cultural knowledge exchange among ethnic groups. Greater richness in the North reflects broader forest cover and resource accessibility. Similar surveys across India (Uttarakhand, Mizoram, Manipur, Meghalaya) confirm the widespread reliance on ethnomedicine [9], [10], [11], [12], [13], [14], [15], [16].

Shrubs and trees dominate growth forms, underscoring the role of woody perennials in healthcare. Leaves are the most frequently used plant part, reflecting sustainable harvesting practices. [17]. Shared species such as *Azadirachta indica* and *Psidium guajava* reveal cultural continuity, widely recognized for antimicrobial and gastrointestinal properties [18], [19]. Unique species highlight ecological diversity and adaptive practices of local healers.

Ailment categories treated—primarily gastrointestinal disorders, fevers, and skin diseases—mirror local health priorities. The inclusion of chronic conditions (diabetes, hypertension) in North Garo Hills indicates adaptation to modern challenges. Comparative reports from other regions show similar ethnomedicinal repertoires addressing cardiovascular, digestive, respiratory, and musculoskeletal disorders. [9], [12], [13], [20], [14], [15], [16].

Critically endangered species like *Swertia chirayita* raise conservation concerns [6], while pharmacologically significant plants (*Catharanthus roseus*, *Rauvolfia serpentina*) reinforce the drug discovery potential of ethnobotanical surveys. [21], [22]. Overall, biodiversity, cultural diversity, and ecological accessibility shape the ethnomedicinal practices of the Garo Hills.

Conclusion

This comparative study documents 110 medicinal plant species across North and West Garo Hills, Meghalaya. There were 32 species belonging to 25 families in the West Garo Hills and 78 species representing 44 families in the North Garo Hills. With 37.5% of species in West Garo Hills and 35.89% in North Garo Hills, shrubs were the most common growth form in both districts. In contrast, leaves were the most commonly utilised plant part, with 59.37% in West Garo Hills and 51.28% in North Garo Hills. After gastrointestinal disorders (diarrhoea, dysentery, and stomach pain), fever, skin conditions, and respiratory issues were the next most common ailments to be treated. Treatments were made as pastes, liquids, decoctions, or eaten uncooked. *Azadirachta indica*, *Psidium guajava*, *Bauhinia variegata*, and *Calotropis gigantea* were common species that were used extensively to treat fevers, skin conditions, and gastrointestinal issues. *Swertia chirayita* in the West Garo Hills and *Clerodendrum glandulosum* in the North Garo Hills were examples of unique species that reflected site-specific biodiversity and cultural customs. The findings highlight shared ethnomedicinal knowledge, sitespecific biodiversity, and the predominance of shrubs and leaves in traditional remedies. Conservation of rare species and phytochemical validation of traditional remedies are recommended for future research.

Declaration

The authors declare that they have no competing interest

Acknowledgement

The authors are grateful to the local communities of North and West Garo Hills for sharing their valuable information. The authors are indebted to the traditional healers and Ojhas for their cooperation. The authors also acknowledge Department of Botany, Gauhati University for identification of the herbarium specimens.

Ethical/Informed consent statement

This ethnobotanical study was conducted in the North and West Garo Hills region of Meghalaya, India, in strict compliance with the International Society of Ethnobiology code of Ethics (ISE) Code of Ethics and the guidelines of the Biological Diversity Act, 2002 of India. Prior clearance was obtained at the community level from the traditional village chiefs and local institutional authorities. Free, Prior, and Informed Consent (FPIC) was obtained verbally in the local Garo language from all individual informants and traditional healers before documenting their knowledge. Field methodologies involved both photographic documentation and the collection of physical plant specimens. The physical specimens were collected solely for the purpose of taxonomic identification and scientific validation, ensuring adherence to local conservation regulations and the guidelines of the Meghalaya State Biodiversity Board. Informants retained all intellectual rights over their traditional knowledge.

References

- [1] World Health Organization. (2023). Integrating Traditional Medicine in Health Care. <https://www.who.int/southeastasia/news/feature-stories/detail/integrating-traditional-medicine>
- [2] Chen, S. L., Yu, H., Luo, H. M., Wu, Q., Li, C. F., & Steinmetz, A. (2016). Conservation and sustainable use of medicinal plants: problems, progress, and prospects. *Chinese Medicine*, 11, 37. <https://doi.org/10.1186/s13020-016-0108-7>
- [3] Sheng-Ji, P. (2001). Ethnobotanical approaches of traditional medicine studies: some experiences from Asia. *Pharmaceutical Biology*, 39(Suppl 1), 74-79. <https://doi.org/10.1076/phbi.39.s1.74.0005>
- [4] Sajem, A. L., & Gosai, K. (2006). Traditional use of medicinal plants by the Jaintia tribes in North Cachar Hills district of Assam, Northeast India. *Journal of Ethnobiology and Ethnomedicine*, 2, 33.
- [5] Shil, S., Dutta Choudhury, M., & Das, S. (2014). Indigenous knowledge of medicinal plants used by the Reang tribe of Tripura state of India. *Journal of Ethnopharmacology*, 152(1), 135-141.
- [6] Panmei, R., Gajurel, P. R., & Singh, B. (2019). Ethnobotany of medicinal plants used by the Zeliangrong ethnic group of Manipur, Northeast India. *Journal of Ethnopharmacology*, 235, 164-182.
- [7] Dolui, A. K., Sharma, H. K., Marein, T. B., & Lalhriatpuii, T. C. (2004). Folk herbal remedies from Meghalaya. *Indian Journal of Traditional Knowledge*, 3(4), 358-364.
- [8] Singh, B., Borthakur, S. K., & Phukan, S. J. (2014). A Survey of Ethnomedicinal Plants Utilized by the Indigenous People of Garo Hills with Special Reference to the Nokrek Biosphere Reserve (Meghalaya), India. *Journal of Herbs, Spices & Medicinal Plants*, 20(1), 1-30.
- [9] Bain, W. K., & Biswas, S. (2021). Ethnobotanical plants and associated traditional wisdom of Garo community of Rongram, West Garo Hills district, Meghalaya, India. *American Journal of Ethnomedicine*, 8(8).
- [10] Devi, M. P., Singh, L. S., Wanniang, S. K., & Singh, R. (2025). Ethnobotanical study of native edible and medicinal plants in Kyrdemkulai, Meghalaya. *International Journal of Minor Fruits, Medicinal and Aromatic Plants*, 11(1), 288-296.
- [11] Khajuria, A. K., Manhas, R. K., Kumar, H., & Bisht, N. S. (2021). Ethnobotanical Study of Traditionally used Medicinal Plants of Pauri District of Uttarakhand, India. *Journal of Ethnopharmacology*, 276(1), 114204.
- [12] Pathaw, N., Kharlyngdoh, E., Rai, S., Chanu, T. B., Das, B., Pakyntein, C. L., Singh, O. S., Singh, K. O., Shukla, J. K., Thorat, S. S., Bhardwaj, P. K., Sharma, N., & Mukherjee, P. K. (2026). Ethnobotanical documentation, codification, and community-led management of medicinal plant diversity in the Khasi Hills region of Meghalaya, India. *Trees, Forests and People*, 27, 101430. <https://doi.org/10.1016/j.tfp.2026.101430>
- [13] Paul, S., & Das, M. (2025). Medicinal Plants used for traditional healing practices among the tribal communities of Ri-Bhoi District, Meghalaya, India. *Current Botany*, 16, 157-168. <https://doi.org/10.25081/cb.2025.v16.9096>
- [14] Ralte, L., Sailo, H., & Singh, Y. T. (2024). Ethnobotanical study of medicinal plants used by the indigenous community of the western region of Mizoram, India. *Journal of Ethnobiology and Ethnomedicine*, 20(2). <https://doi.org/10.1186/s13002-023-00642-z>
- [15] Singh, B., & Borthakur, S. K. (2011). Wild Medicinal Plants used by Tribal Communities of Meghalaya. *Journal of Economic and Taxonomic Botany*, 35(2), 331-339.
- [16] Singh, S. S., Ralte, L., Sailo, H., Pinokiyo, A., Devi, M. R., Khomdram, S. D., & Singh, Y. T. (2025). Ethnobotanical study of medicinal plants used by Lois community of Kakching district, Manipur, India. *Trees, Forests and People*, 19, 100765. <https://doi.org/10.1016/j.tfp.2024.100765>
- [17] Singh, A., & Singh, P. K. (2009). An ethnobotanical study of medicinal plants in Chandauli District of Uttar Pradesh, India. *Journal of Ethnopharmacology*, 121(2), 324-329.
- [18] Das, A. K., Dutta, B. K., & Sharma, G. D. (2008). Medicinal plants used by different tribes of Cachar district, Assam. *Indian Journal of Traditional Knowledge*, 7(3), 446-454.
- [19] Bhattacharyya, R., Medhi, K. K., Borthakur, S. K., & Borkataki, S. (2020). An Ethnobotanical Study of Medicinal Plants used against Jaundice by Tea Tribes of Morigaon District, Assam (India). *Journal of Natural Remedies*, 20(1), 16-28.
- [20] Qureshi, M. S., Reddy, A. V., Kumar, G. S., & Nousheen, L. (2017). Ethnobotanical study on Medicinal Plants used by Traditional Health Practitioners and Villagers of Garhpulghar Gram, Chhattisgarh, India. *Asian Journal of Pharmaceutical Research*, 7(2), 98-105.
- [21] Ignacimuthu, S., Ayyanar, M., & Sankarasivaraman, K. (2008). Ethnobotanical study of medicinal plants used by Paliyar tribals in Theni district of Tamil Nadu, India. *Fitoterapia*, 79(7-8), 562-568. <https://doi.org/10.1016/j.fitote.2008.06.003>
- [22] Laha, R., Lalhriatpuii, R., Ralte, L., & Lalremruata, P. C. (2016). Indigenous uses of antidiabetic plants by ethnic inhabitant of Mizoram, Northeast India. *Journal of Medicinal Plants Studies*, 4(6), 181-184.