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From Forest to Remedy: Medicinal Plants and Indigenous Therapeutic Knowledge among Naga tribes of Manipur, Indo-Myanmar Biodiversity Hotspot

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Abstract

Background: The Rongmei and Tangkhul Naga tribes of Manipur are forest-dwelling communities that have traditionally relied on medicinal plants for primary healthcare. Ethnomedicinal knowledge has been documented for these tribes in the Tamenglong/Noney and Ukhrul districts, respectively, but populations in the ecologically distinct Churachandpur and Kamjong districts remain undocumented, and no study has applied a quantitative framework to compare the two tribes and prioritize species for pharmacological validation. We documented medicinal plant use among both tribes in these districts and evaluated informant consensus and cross-cultural patterns to inform pharmacological and conservation priorities.

Methods: Field surveys were conducted from July 2024 to April 2025 across ten villages using multistage sampling. Data were gathered from informal interviews and focus group discussions using modified semi-structured questionnaires, and plants were identified using regional floras and consultation with taxonomists. Relative frequency of citation (RFC), use value (UV), fidelity level (FL), and informant consensus factor (ICF) were used to assess species importance; the Jaccard Index (JI) and Rahman's Similarity Index (RSI) were used to assess cross-cultural similarity in taxa and therapeutic use. Informants were general

community members rather than specialized healers, and because each tribe was sampled in a single district, tribal identity, local ecology, interviewer, and sampling intensity could not be disentangled. Effect sizes, an overlap coefficient that adjusts for unequal inventory size, and exact confidence intervals were added to the comparisons

Results: Among 373 informants (aged 21–86 years), gender, age, and education were not significantly associated with plant-use knowledge in either community. We recorded 131 taxa from 117 genera and 57 families, used to treat 83 human ailments, including a distinctive Rongmei practice of using burnt *Goniothalamus sesquipedalis* ash for gastritis, fever, and warding off evil spirits. Species overlap between communities was low (JI = 16.03%), and RSI (9.16%) indicated modest concordance in therapeutic use of shared taxa. Plant-part use differed significantly in five of ten categories, though leaves dominated in both. *Brassaiopsis glomerulata*, *Phlogacanthus thyrsoformis*, *Mikania micrantha*, *Goniothalamus sesquipedalis*, *Zanthoxylum acanthopodium*, and *Clerodendrum colebrookeanum* emerged as the strongest candidates for pharmacological screening based on RFC and FL. Several taxa, including *Aquilaria malaccensis* (Critically Endangered), are of global conservation concern.

Conclusion: The study documents rich community-level ethnomedicinal knowledge among the Rongmei and Tangkhul Naga and shows that low taxonomic overlap can coexist with substantial agreement in the use of shared plants. Pharmacological validation and safety screening of promising species, targeted conservation of threatened taxa, and community-controlled benefit-sharing are needed to safeguard this cultural and botanical heritage.

Keywords—herbal remedies, Naga tribes, Indo-Myanmar biodiversity hotspot, cross-cultural ethnomedicine. ethnobotany, informant consensus, access and benefit-sharing, traditional knowledge.

Background

Many ethnic groups and rural communities worldwide extensively use medicinal plants to treat ailments affecting both humans and animals, drawing on traditional knowledge and beliefs accumulated and refined over generations [1–3]. In several developing countries, particularly in Asia, Africa, and Latin America, such plant-based practices remain vital to meeting healthcare needs, particularly where access to formal biomedical services is limited [4–6]. This knowledge is widely reported to support the health and well-being of local communities, although the clinical efficacy of most individual practices has yet to be systematically validated. Besides the direct healthcare use, this traditional knowledge also aids in biodiversity conservation, sustainable utilization, and pharmacological discovery [7,8]. As such, both the plant resources themselves and the accumulated knowledge of their use constitute a form of cultural heritage that is increasingly recognized as warranting systematic documentation and protection against irreversible loss [9].

India, as one of the world's most floristically diverse countries, illustrates the scale of this untapped resource. Out of the estimated 22,605 spermatophyte taxa [10], about 5,137 species are traditionally employed in folk medicine, yet only 86 taxa of these have undergone formal pharmaceutical trials and subsequently integrated into modern medical practice [11]. This wide and largely unaddressed gap between traditionally reported use and pharmacologically validated efficacy calls attention to the need for systematic ethnomedicinal documentation and quantitative ethnopharmacological prioritization. This will responsibly translate indigenous knowledge into evidence-based therapeutics and to safeguard this knowledge before it is lost.

Manipur, a state in northeastern India, covers a total area of 22,327 km² and lies between latitudes 23°50' N and 25°42' N and longitudes 92°59' E and 94°46' E. As of the

most recent India State of Forest Report assessment, the state has a high forest cover of 74.29%, encompassing ten distinct forest types under the Champion and Seth's Forest classification [12]. Situated at the transition zone between the Himalaya and Indo-Myanmar biodiversity hotspots [13], the state supports high floristic diversity, harboring approximately 3,922 plant taxa, many of which are rare or endemic, including *Lilium macklinae* and *Sapria himalaya* [14], underscoring the region's conservation significance. The state is also characterized by a complex mosaic of ethnic communities, each with distinct cultural traditions and long-standing relationships with the surrounding natural environment. Alongside the dominant Meitei/Meetei indigenous group, the hilly and forested regions are inhabited by 32 recognized scheduled tribes and other communities [15]. These ethnic groups maintain distinct customs, languages, dietary practices, and festivals that are deeply rooted in their respective cultural identities. Notably, many of these communities continue to rely heavily on forest resources for their livelihoods [2,16–18]. The various ethnic communities in Manipur utilize about 887 medicinal taxa (22.6% of total reported taxa from the state) for traditional therapeutic practices [14,19]. This highlights the richness of indigenous ethnobotanical knowledge and suggests the continued importance of traditional medicine in local healthcare practices.

For generations, the forest-dwelling Rongmei and Tangkhul Naga tribes have maintained a close relationship with forest resources, which support their subsistence, livelihoods, and medicinal needs. Among these resources, medicinal plants remain central to traditional healthcare systems. The associated ethnomedicinal knowledge has historically been transmitted across generations through observation, oral narratives from elders, and experienced traditional healers.

This knowledge is exposed to two related but distinct pressures. First, changes in medical care access, education, religious practice, and livelihood patterns may reduce the transmission

of some forms of traditional knowledge [20–22]. Second, habitat loss, road expansion, forest fires, and other forms of land-use change may reduce the availability of the plants that this knowledge concerns [12,23–25].

These pressures on knowledge and resources also have a global policy dimension. The World Health Organization’s Global Traditional Medicine Strategy 2025–2034, adopted by the Seventy-eighth World Health Assembly, calls for stronger evidence and for the safe, culturally respectful integration of traditional medicine [26]. Under the Kunming–Montreal Global Biodiversity Framework, Parties agreed on sustainable, safe and legal use of wild species (Targets 5 and 9), fair sharing of benefits from traditional knowledge associated with genetic resources (Target 13), and the participation of Indigenous peoples and local communities in decision-making (Target 22) [27]. These commitments build on the Nagoya Protocol [28] and, in India, on the Biological Diversity Act, 2002 [29]. Transparent, reproducible community-level inventories from biodiversity hotspots are therefore needed both to prioritise taxa for pharmacological study and to support community-controlled documentation. Naga communities also live across the Indo-Myanmar border, so knowledge documented here may be relevant to the wider Indo-Myanmar hotspot.

Given these pressures, documenting this ethnomedicinal knowledge is a timely priority, both to conserve cultural heritage before further loss and to identify promising taxa for pharmacological investigation. Such documentation needs to go beyond plant names and reported uses. It should also preserve information on plant parts, preparation methods, administration routes, therapeutic categories, and community-specific patterns of knowledge.

With the aim of documenting traditional ecological knowledge, ethnobotanical studies have been conducted on the Rongmei tribe in the Tamenglong and Noney districts [2,30–32] and the Tangkhul tribe in the Ukhrul district [18,33–35]. However, populations of these same

Naga tribes residing in the Churachandpur (Rongmei) and Kamjong districts (Tangkhul), geographically and ecologically distinct from the previously studied areas, remain undocumented, leaving a significant geographical gap in the ethnobotanical record for these ethnic groups. Furthermore, a separate methodological gap also exists, where the current literature lacks a systematic cross-cultural comparison between these tribes and a quantitative framework for prioritizing candidate species for pharmacological validation. Together, these gaps carry two distinct risks: the continued erosion of undocumented traditional knowledge with each passing generation, and missed opportunities to direct pharmacological and conservation intervention towards the most promising species.

Therefore, there might be the following possible hypotheses: H1. the ethnomedicinal knowledge is associated with informants' demographic characteristics, i.e., gender, education, and age; H2. The Rongmei and Tangkhul communities will show limited overlap in medicinal plant taxa and associated therapeutic uses. Because plant availability, sampling intensity, district, and interviewer could not be separated from tribal identity, this hypothesis is assessed as to whether the observed divergence is consistent with community-specific knowledge, not as a test of cultural versus ecological causation; and H3. The proportion of plant parts used differs between the Rongmei and Tangkhul tribes.

Addressing both gaps and to test the above hypotheses, the present study aims to document the floristic diversity and associated traditional knowledge of these two tribes, with the following specific objectives: i) to evaluate the relationship between the informants' demographic characteristics (age, education level, and gender) and their traditional plant-use knowledge; ii) to document the taxonomic diversity and reported therapeutic uses of medicinal plants used by the Rongmei and Tangkhul Naga tribes in Churachandpur and Kamjong districts; iii) to assess quantitative ethnobotanical indices to identify and prioritize candidate taxa for subsequent pharmacological validation and conservation intervention; and

iv) to assess the cross-cultural medicinal plant knowledge across the two tribes and identify shared and distinctive medicinal-plant practices.

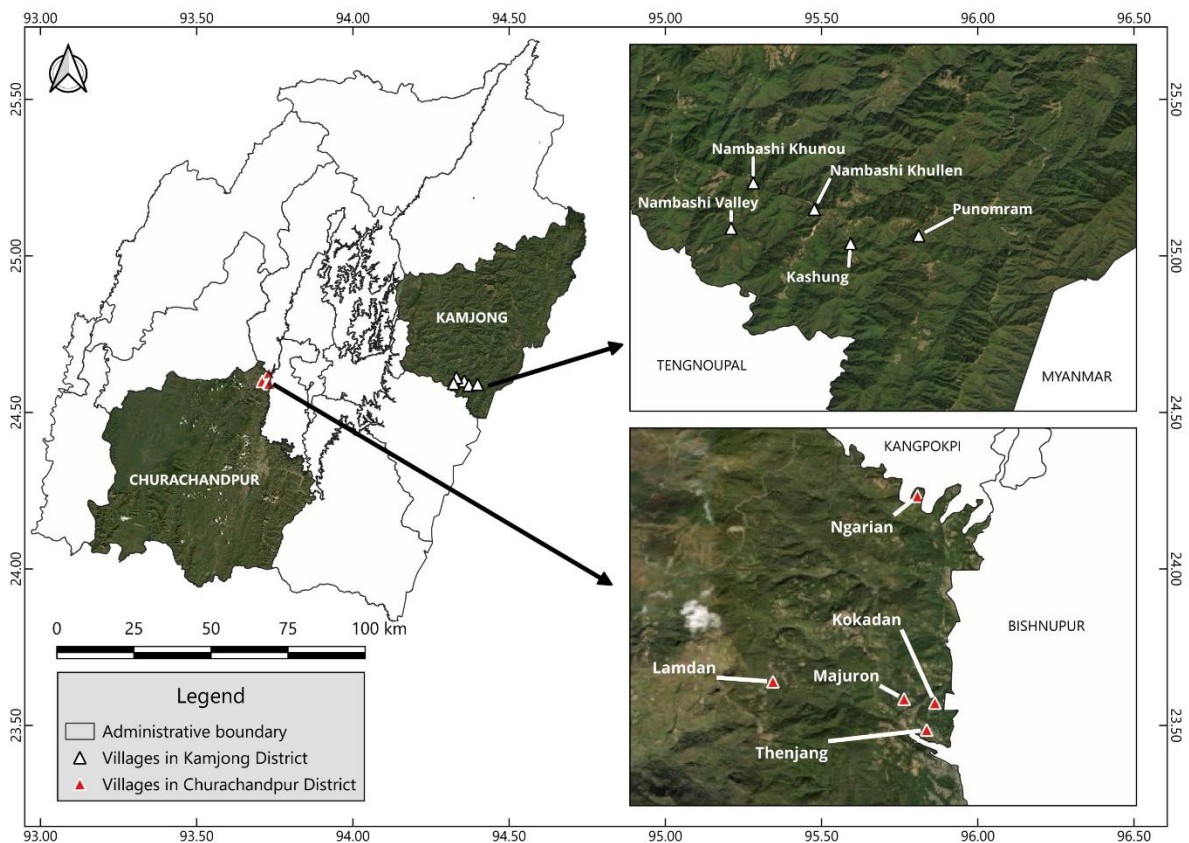
Material and Methods

Study Site and the selected tribes

The study was carried out in two hill districts of Manipur — Churachandpur and Kamjong. Five villages in each district were selected, inhabited respectively by the Rongmei and Tangkhul tribes (Figure 1). Churachandpur district (geographical area: 2,419 km²) lies in the southwestern part of Manipur, between 23°56'–24°36' N latitude and 92°58'–93°52' E longitude, at elevations ranging from 350 to 1,950 m above mean sea level. It is bordered by Myanmar to the east, Noney district to the west, Imphal to the north, and Mizoram to the south. The district is ethnically heterogeneous, home to Zomi, Kuki, Mizo, Chin, Kom, and Naga communities, and reported a population of 274,143 (138,820 males; 135,323 females) as per the Census of India [36]. According to the same source, approximately sixteen Rongmei Naga villages with a combined population of 2,843 are located within the district; five of these — Ngarian, Lamdan, Kokadan, Thenjang, and Majuron — were randomly selected for the present study. Forest cover in the district totals 1,911.76 km² (79.01% of its

geographical area), comprising predominantly East Himalayan sub-tropical wet hill forest, secondary moist bamboo brakes, and Buk oak forest [12].

Figure 1: Map of Manipur showing the study sites in Churachandpur and Kamjong districts.



Kamjong district (geographical area: ~2,478.75 km²) lies in the northern part of Manipur, between 24.70°–25.00° N latitude and 94.30°–94.70° E longitude, at elevations ranging from 913 to 3,114 m above mean sea level, and is bordered by Ukhrul district to the north, Myanmar to the east, Tengnoupal district to the south, and Thoubal and Imphal districts to the west. The district reported a population of 16,717 (7,913 males; 7,676 females) [36]. Five Tangkhul villages — Nambashi Khullen, Nambashi Khunou, Nambashi Valley, Kashung, and Punomram — were selected; these villages lie in close geographic proximity and share a common dialect, *Dardouy*, a variety of the Tangkhul language. Forest cover totals 2,151.50 km² (86.80% of the district's geographical area), comprising East Himalayan sub-

tropical wet hill forest, Buk oak forest, Assam sub-tropical pine forest, and Cachar tropical semi-evergreen forest [12].

The selected tribe

The Rongmei and Tangkhul are two of the indigenous Naga tribes among the 32 scheduled tribes recognized in Manipur state [15]. The Rongmei are concentrated primarily in Tamenglong and Noney districts, with smaller populations distributed across Bishnupur, Churachandpur, Imphal East, Imphal West, Kangpokpi, Senapati, and Thoubal. The Tangkhul are concentrated along the Indo-Myanmar border area, principally in Ukhrul and Kamjong districts. Linguistically, both tribes speak languages belonging to the Tibeto-Burman branch of the Sino-Tibetan language family [37,38]. Both communities have historically maintained a subsistence economy centered on agriculture and forest-resource use, with customary institutions, oral traditions, and material culture closely tied to the surrounding forest landscape.

Sample size and informant determination

To ensure representativeness across the ten villages, the sample size was determined using the Yamane method for sample size determination [39].

$n = \frac{N}{1+N(e)^2}$, where n denotes the required sample size, N represents the total number of households in the selected villages, and 'e' is the margin of error, set at 5%. The distribution of informants across villages was further determined proportionally, based on the number of households in each village. For instance, in Ngarian village, the total number of households was 135; applying proportional allocation, the sample size was calculated as

$$n = \frac{135 \times 201}{406} = 66.83$$

204 Thus, $66.83 \approx 67$ respondents were selected from Ngarian Village, ensuring that the sample
 205 size reflected the relative household distribution across all villages. In this study, one
 206 individual was selected from each household to participate. The same calculation was
 207 performed for the other villages, as shown in Table 1.

208 **Table 1.** Basic information on the selected villages

Name of the village	GPS location	Mean altitude (m above msl)	Ecology	Language (Glottocode)	No. of households	No. of informants selected
Churachandpur District						
1. Kokadan	24.59638 N, 93.73388 E	895	Situated in elevated terrain, within a tropical forest ecosystem.	Rongmei (rong1266; Sino-Tibetan)	37	18 (M-10, F-8)
2. Lamdan	24.59944 N, 93.71056 E	1268	Situated at the periphery of a forested ecosystem, with subtropical vegetation patterns and a mountainous landscape	Rongmei (rong1266; Sino-Tibetan)	61	30 (M-10, F-20)
3. Majuron	24.59694 N, 93.72944 E	939	Situated at the periphery of a forested ecosystem, with a tropical vegetation pattern and hilly terrain.	Rongmei (rong1266; Sino-Tibetan)	80	40 (M-15, F-25)
4. Ngarian	24.62611 N, 93.73138 E	1153	Situated at the periphery of a forested ecosystem, with a tropical vegetation pattern and hilly terrain.	Rongmei (rong1266; Sino-Tibetan)	135	67 (M-29, F-38)
5. Thenjang	24.5925 N, 93.7327 E	906	Situated at the periphery of a forested ecosystem, with a tropical vegetation pattern and hilly terrain.	Rongmei (rong1266; Sino-Tibetan)	93	46 (M-21, F-25)
					Total	201
Kamjong District						
1. Nambashi Khullen	24.600822 N, 94.356616 E	1093	Mountainous landscape with a subtropical ecosystem, bordered by the Tuyungbi and Taret river systems.	Dardouy, Tangkhul (tang1336; Sino-Tibetan)	154	88 (M-59, F-29)
2. Nambashi Khunou	24.611617 N, 94.331603 E	1246	Mountainous landscape with a subtropical ecosystem, bordered by the Tuyungbi and Taret river systems.	Dardouy, Tangkhul (tang1336; Sino-Tibetan))	33	19 (M-12, F-7)
3. Nambashi Valley	24.593003 N, 94.322528 E	990	Mountainous landscape with a tropical ecosystem.	Dardouy, Tangkhul (tang1336; Sino-Tibetan)	14	8 (M-4, F, 4)

4. Kashung	24.586842 N 94.371425 E	931	Mountainous landscape with a tropical ecosystem.	Dardouy, Tangkhul (tang1336; Sino- Tibetan)	74	42 (M-25, F-17)
5. Punomram	24.590075 N, 94.399356 E	827	Mountainous landscape with a tropical ecosystem.	Dardouy, Tangkhul (tang1336; Sino- Tibetan)	26	15 (M-10, F-5)
					Total	172

209

210 Note: All surveyed villages are self-identified as Rongmei and Tangkhul tribes following Christianity. M=male,
211 F=Female,

212 **Ethnomedicinal data collection**

213 The field survey was carried out from July 2024 to April 2025 in ten villages of the two
214 districts. For this study, a multistage sampling approach was employed: simple random
215 sampling for site selection, combined with purposive sampling for informant selection
216 [40,41]. Purposive sampling was employed to select informants with demonstrated
217 ethnobotanical knowledge, availability for interviews, willingness to participate, and a range
218 of ages sufficient to capture intergenerational variation in knowledge. No informants who
219 participated identified themselves as specialized traditional healers. The resulting sample
220 instead reflects general community-level ethnomedicinal knowledge. The purposes of the
221 study were clearly explained before the interview, and prior informed consent was obtained,
222 adhering to the ISE Code of Ethics and guidelines [42]. The information on medicinal plants
223 and their uses was collected by integrating informal interviews and focus group discussions
224 (Figure 2) using modified semi-structured questionnaires adapted from Jain [43] (Appendix
225 1). For the interviews and discussions, six specified field trips, each lasting three to five days,
226 were undertaken. Interviews were carried out in their respective native languages. The second
227 (LD) and third (UN) authors belong to the Rongmei and Tangkhul tribes, respectively, which
228 made data interpretation and recording easier. The filled-out questionnaires were deposited in
229 the Library of the Department of Forestry, Manipur University.

230

Plant identification and herbarium preparation

Voucher specimens of the plant species reported during interviews and group discussions were photographed and collected from natural habitats during guided forest walks (Figure 2), ensuring that indigenous knowledge and ecological context were accurately captured. For each species, habitat, growth form, and reported medicinal uses were recorded in a field notebook and data sheet (Appendix 1). Specimens were subsequently transported to the laboratory, where they were dried, pressed, and mounted following standard herbarium techniques [44].

Preliminary plant identification to the genus level was performed by the first author (RP). Species-level identification was carried out through comparison with regional floras [14,45,46], the e-Floras of India (<https://efloraofindia.com/>), and further verification was provided by a senior taxonomist affiliated with EHSST. Nomenclature and author citations for all the reported taxa were validated through the International Plant Names Index (IPNI; www.ipni.org) and Plant of the World Online (POWO; <https://powo.science.kew.org/>). All confirmed specimens were accessioned and deposited as voucher herbarium specimens in the Forest Herbarium (code: IMFOR) of the Department of Forestry, Manipur University—within India, the same country in which they were collected—for long-term reference and future taxonomic verification. No international transfer of biological material occurred.

Data analysis

Use reports

A Use Report (UR) was recorded each time an informant cited a specific plant species or a designated plant part for the treatment of a particular ailment. The ethnomedicinal data were subsequently analyzed by tabulating the total number of UR associated with each cited species and part use.

UR counting rule applied in the study: When a single UR specified more than one ICPC ailment category, preparation mode, or administration route, its UR value was counted once, independently, under each applicable category within that dimension. Where the underlying database recorded the same use-report across multiple rows — for example, because a single citation count was logged separately for each combination of ailment wording and administration route even when these shared the same ICPC category or preparation mode — such rows were first collapsed to their distinct underlying UR before counting, so that a given UR value contributes only once per applicable category, and not once per row. Consequently, summed totals differ slightly across the three analytical dimensions (ailment category, preparation mode, administration route), and may exceed the total number of discrete UR recorded in Table 3. Ailment-level convergence and consensus statistics (e.g., FL and RSI) were computed directly from the underlying use-report records in Table 3, rather than by summing any pre-tabulated per-dimension table, to avoid double-counting UR that had been split across multiple mode or route entries.

Categorization of Ailments

All reported medicinal plants and their corresponding treated ailments were classified according to the International Classification of Primary Care (ICPC) (<https://www.who.int/standards/classifications/other-classifications/international-classification-of-primary-care>), with minor modifications to accommodate locally reported conditions. The ICPC was selected over alternative classification systems, such as the International Classification of Diseases (ICD) and the Economic Botany Data Collection Standard (EBDS), because its categories are structured around patient-perceived illness experience rather than clinical diagnostic criteria, rendering it more compatible with ethnomedicinal data [47]. Ailments that did not correspond to a defined category — such as unknown swelling or illnesses attributed to evil spirits — were grouped under "General and

Unspecified." Subsequently, fourteen ailment categories were thus defined: (1) Blood, Blood-
Forming Organs and Immune Mechanism (BLD-B); (2) Cardiovascular (CAR-K); (3)
Digestive (DIG-D); (4) Ear (EAR-H); (5) Eye (EYE-F); (6) Female Genital (FEM-X); (7)
General and Unspecified (GEN-A); (8) Endocrine/Metabolic and Nutritional (MET-T); (9)
Musculoskeletal (MUS-L); (10) Neurological (NEU-N); (11) Pregnancy, Childbearing, and
Family Planning (PRE-W); (12) Respiratory (RES-R); (13) Skin (SKIN-S); and (14)
Urological (URO-U).

Quantitative analysis

To identify culturally important species, potential species for pharmacological studies, and
conservation prioritization, the following quantitative indices were determined.

Use value (UV)- The relative importance of each taxon within the medicinal flora was
determined using the use value index of Phillips & Gentry [48]

$UV = \Sigma U/n$, where UV = the use value of the species, ΣU = the number of use reports
of that given species, and n = the total number of informants in the study.

Relative Frequency of Citation (RFC) - The extent to which a species was recognized
among informants was quantified using the RFC index. The RFC for every species is
computed following Tardío & Pardo-de-Santayana [49]

$RFC = FCs/n$, where FCs = the number of informants who cited a particular plant
species, and n = is the total number of informants in the study.

Informants Consensus Factor (ICF) - To determine the level of homogeneity of
information regarding plant use for a particular disease and ailment category provided by the
informants, was calculated following Trotter & Logan [50]

302 $ICF = \frac{Nur - Nt}{(Nur - 1)}$, where Nur = number of use reports from informants for a
 303 particular plant-use category, and Nt = number of taxa or species used for that plant-use
 304 category for all informants. ICF values range from 0 to 1; values approaching 1 indicate strong
 305 consensus (i.e., a small number of taxa account for the majority of UR), whereas values closer
 306 to 0 indicate substantial disagreement among informants regarding taxon selection for that
 307 category.

308 *Fidelity Level (FL)%* - The percentage of informants citing a given species for a specific
 309 primary use, relative to all informants reporting that species for any use, was calculated for the
 310 most frequently cited ailments following Alexiades [51]

311 $FL (\%) = (Np / N) \times 100$, where Np = the number of informants who claim to use a
 312 plant species to treat a particular disease, and N = the number of informants who use plants as
 313 medicine to treat any given disease.

314 ***Cross-cultural ethnopharmacology***

315 *Jaccard Index (JI)*- Floristic similarity in medicinal plant use between the two Naga tribal
 316 communities (Churachandpur and Kamjong districts) was assessed using the JI following
 317 González-Tejero et al. [52] as

318 $JI = [\frac{C}{A+B-C}] \times 100$, where A and B is the number of taxa reported from Churachandpur and
 319 Kamjong districts, respectively, and C refers to the number of taxa common to both districts.

320 *Rahman's Similarity Index (RSI)*: Homogeneity in the use of plants to treat shared ailments across
 321 the two study areas was assessed using RSI, following Rahman et al. [53] as

322 $RSI = \frac{d}{a+b+c-d} \times 100$, where 'a' represents the number of plants unique to Churachandpur, 'b'
 323 represents the number of plants unique to Kamjong, 'c' represents the number of plants

common to both areas, and 'd' represents the number of common plants used to treat the same ailment.

Statistical analysis

Kruskal–Wallis and Wilcoxon rank-sum tests were applied to assess the significance of the three demographic variables and the number of plants cited. The Kruskal–Wallis’s test was used for variables with more than two categories (i.e., age and education level), whereas the Wilcoxon rank-sum test was used for comparisons involving two categories (i.e., gender).

Differences in plant-part use between the Tangkhul and Rongmei were assessed using Fisher’s exact test. For each plant-part category, use reports were compared in a 2×2 table of that category versus all other categories combined. Fisher’s test was used because some cells were small or zero [54]. Bonferroni correction was applied to account for multiple comparisons; for ten plant-part categories, the adjusted significance threshold was $\alpha = 0.005$. All tests were two-tailed and performed using the R base package ‘stats’ version 4.4.3. [55]

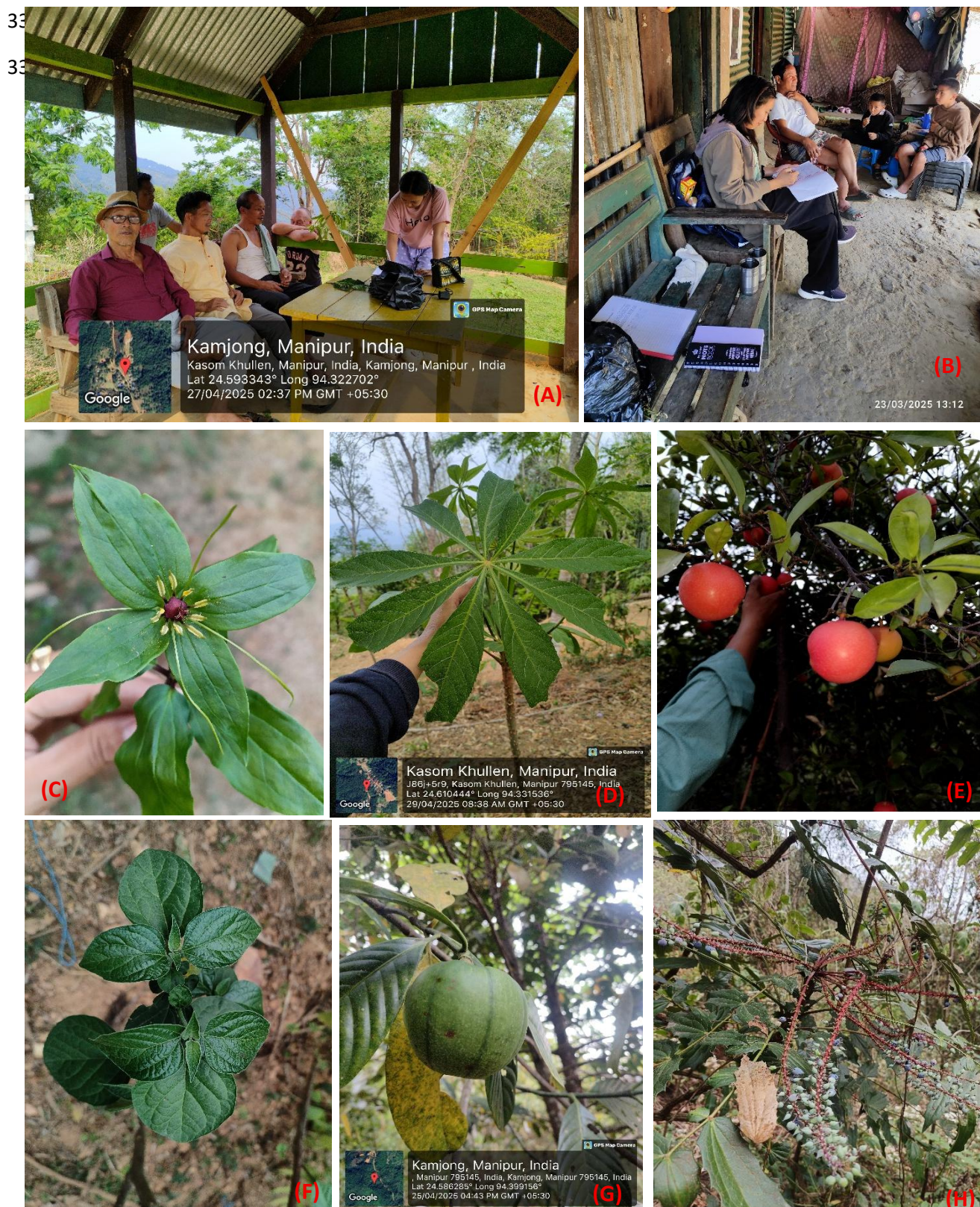


Figure 2. Photographs illustrating interaction with informants in (A)- Kamjong, (B)- Churachandpur; Medicinal Plants collected in the field through guided forest walk (C)- *Paris polyphylla*, (D)- *Brassaiopsis glomerulata*, (E)- *Garcinia indica*, (F)- *Clerodendrum colebrookeanum*, (G)- *Garcinia pedunculata*, (H)- *Berberis napaulensis*

Photo credits: Lanrilu Dangmei and Ungpemi Ningshen

Results

Socio-demographic characteristics of the informants

A total of 373 informants participated in the study: 201 in Churachandpur and 172 in Kamjong. Male informants (52.28%) slightly outnumbered female informants (47.72%) overall. Ages ranged from 21 to 86 years, and educational attainment was concentrated at the secondary level (47.18%), with the fewest informants holding a master's degree (5.89%). Full demographic and citation data are presented in Table 2.

Table 2: Demographic profile of the informants in Churachandpur and Kamjong districts

Variable	Categories	No. of Informant (Churachandpur, n=201)	No. of plants cited	No. of Informant (Kamjong, n=172)	No. of plants cited
Gender	Female	116	102	62	23
	Male	85	108	110	34
Age	21-31	20	60	25	18
	32-42	52	87	30	22
	43-53	43	90	33	25
	54-64	39	89	41	28
	65-75	37	90	28	27
	Above 75	10	55	15	25
Education	No education	19	54	0	0
	Primary level	44	83	59	34
	Secondary level	103	106	73	29
	Graduate	26	79	27	24
	Master	9	55	13	12

Influences of socio-demographic variables on medicinal plant knowledge

Among Rongmei informants, males reported more plant uses on average (10.85 ± 6.91) than females (9.00 ± 4.89); this difference was not statistically significant (Wilcoxon rank-sum test, $W = 4334$, $p = 0.143$). Among Tangkhul informants, the pattern was similar in direction but smaller in magnitude (males: 2.85 ± 1.90 ; females: 2.55 ± 1.55 ; $W = 3147.5$, $p = 0.391$). Gender was therefore not significantly associated with the number of plants used reported in either community (Figure 3).

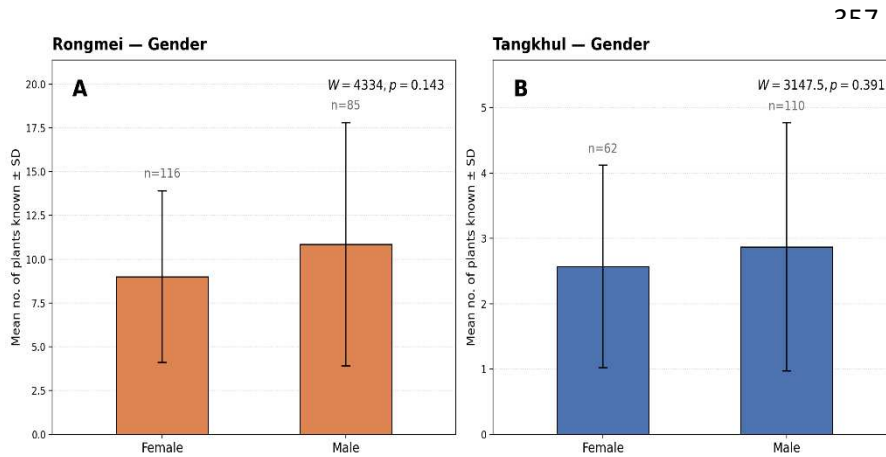


Figure 3: Plant-use knowledge (mean± SD) by gender, Rongmei and Tangkhul communities (Wilcoxon rank-sum test; both comparisons not significant, $p > 0.05$)

Educational attainment showed no significant association with plant-use counts in either community. Among Rongmei informants, means ranged from 9.00 ± 2.38 (no education) to 11.11 ± 5.82 (primary education) (Kruskal–Wallis $\chi^2 = 8.01$, $df = 4$, $p = 0.091$). Among Tangkhul informants, means ranged from 1.77 ± 0.93 (master's level) to 2.90 ± 1.70 (primary level) ($\chi^2 = 5.81$, $df = 3$, $p = 0.121$) (Figure 4A, C).

Age class showed the same pattern. Among Rongmei informants, means ranged from 8.65 ± 6.19 (21–31 years) to 10.82 ± 5.30 (54–64 years) ($\chi^2 = 8.58$, $df = 5$, $p = 0.127$). Among Tangkhul informants, means ranged from 2.42 ± 1.50 (43–53 years) to 3.27 ± 3.01 (above 75 years) ($\chi^2 = 3.99$, $df = 5$, $p = 0.551$) (Figure 4).

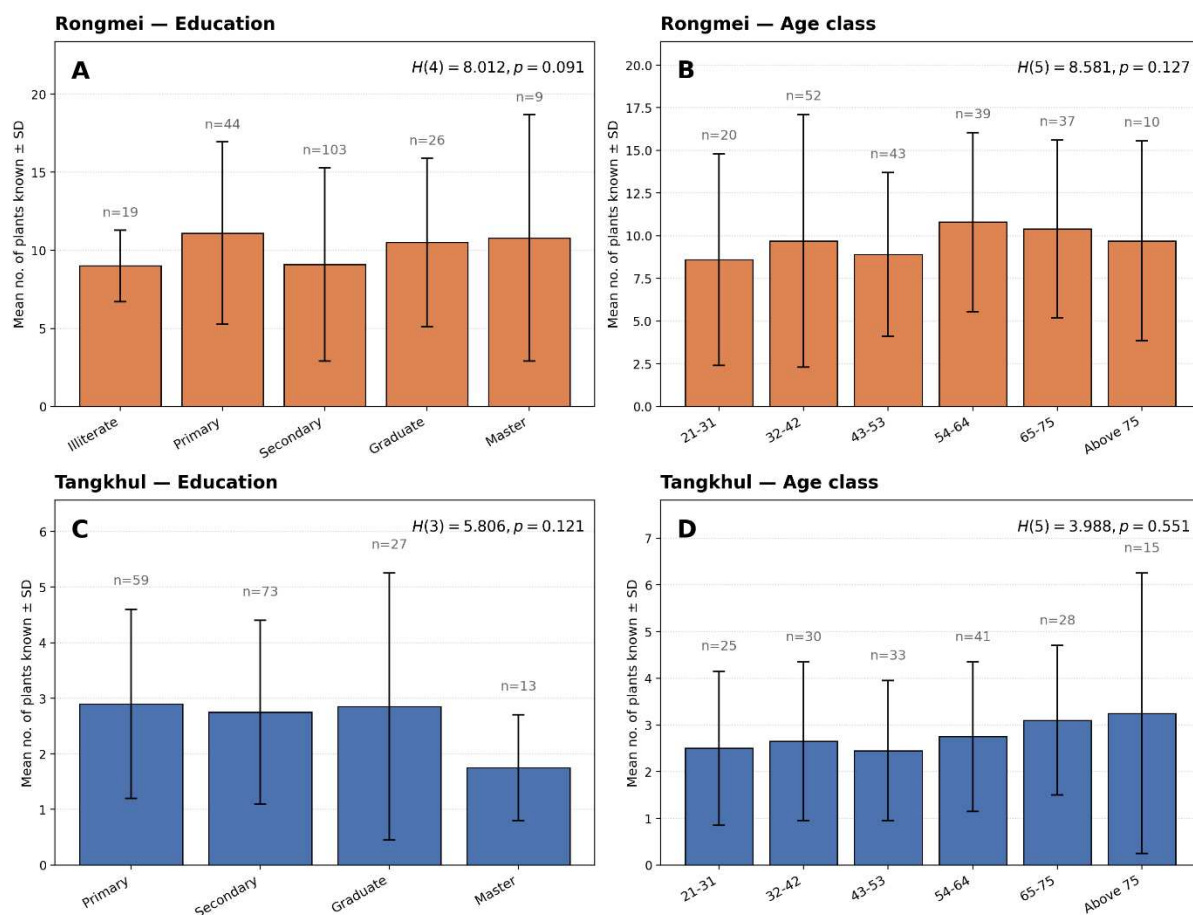


Figure 4. Plant-use knowledge (mean $\pm$ SD) by education (A & C) and Age class (B & D) among the Rongmei and Tangkhul communities (Kruskal-Wallis χ^2 test; all comparisons non-significant, $p > 0.05$).

Taxonomic diversity of medicinal plants utilized by the Rongmei and Tangkhul tribes

The study recorded 131 taxa (130 species and 1 subspecies) from 10 villages in Churachandpur and Kamjong districts with various ethnopharmacological and therapeutic applications. These 131 plant taxa are distributed across 117 genera and 57 families, comprising 127 angiosperms (110 dicots and 17 monocots) and two species each from gymnosperms and pteridophytes. Most of the plant taxa of medicinal value are collected from forests, trees outside forests, and home gardens, and only a few species are semi-domesticated, e.g., *Nicotiana tabacum*, *Carallia brachiata*, *Garcinia pedunculata*, etc. The details of the recorded taxa, including botanical name(s), local name(s), habit, part(s) of the plant utilized, UR, RFC, ailment(s) treated and disease categories, mode of drug preparation,

389 and route of administration, are presented in Table 3. Forty-five taxa (34.4%) are marked in
390 Table 3 as having both medicinal and edible uses.

391 The predominant recorded families are Asteraceae (15 genera, 15 spp.), Rutaceae (9
392 genera, 10 spp.), Zingiberaceae (4 genera, 9 spp.), Lamiaceae (8 genera, 8 spp.), Fabaceae (7
393 genera, 7 spp.), Solanaceae (4 genera, 6 spp.), Poaceae (5 genera, 5 spp.), and Apiaceae (4
394 genera, 4 spp.), while the remaining 48 families are found to be represented by fewer than 3
395 taxa each. The most prominent genera used as medicine are *Curcuma*, *Alpinia*, *Solanum*, and
396 *Blumea*. In terms of the growth habit, 42% of the medicinal taxa are herbs, followed by 28%
397 shrubs, 22% trees, 6% climbers, and 1% each of parasitic epiphytes and arborescent grasses.

398

399 **Table 3.** Ethnopharmacology and medicinal plants used by the Rongmei and Tangkhul Naga tribes of Manipur.

Sl no.	Botanical name [Family]; Voucher no.	Local name(s)	Growth habit	Use reports (UR)	RFC (n=373)	UV (n=373)	Part used	ICPC category	Ailments treated	Methods of preparation/processing	Route of administration
1.	<i>Acmella paniculata</i> (Wall. Ex DC.) R.K. Jansen [Asteraceae]; LD-26	Benggit (R)	H	24	0.064	0.008	Lf	DIG-D	Piles	The fresh leaves are crushed to extract juice, mixed with cold water, and ingested to relieve piles and associated discomfort.	Oral
				R: 3			Lf	DIG-D	Intestinal worm	The fresh tender leaves are chewed and ingested to kill or expel intestinal worms.	Oral
				R: 16			Lf	DIG-D	Toothache	The leaves are crushed into a paste, then applied to the affected teeth and gums to relieve the pain.	Buccal
2.	<i>Acorus calamus</i> L. [Acoraceae]; LD-197	Gakga (R)	H	15	0.040	0.016	Rh	GEN-A	Evil spirit	The fresh rhizome is chewed or crushed into a paste, then topically applied to the entire body downward to ward off the evil spirit.	Oral, Topical
				R: 3			Rh	DIG-D	Gastritis	The rhizome is prepared as a decoction and ingested, or the part is boiled with water, and the steam is collected on a wet cloth for massage, to relieve gastritis discomfort.	Oral, Massage
				R: 1			Rh	DIG-D	Intestinal worm	The rhizome is crushed into a paste, then topically applied to the head to treat intestinal worm infestation.	Topical
				R: 2			Rh	NEU-N	Numbness	The fresh rhizome is consumed raw or crushed into a paste and applied topically to alleviate numbness.	Oral, topical
				R: 3			Rh	DIG-D	Stomachache	The fresh rhizome is chewed and ingested to relieve stomachache and other discomfort	Oral
				R: 3			Rh	DIG-D	Toothache	The rhizome is crushed into a paste and applied on the affected area of the teeth and gums to alleviate the pain.	Buccal
3.	<i>Ageratina adenophora</i> (Spreng.) R.M.King & H.Rob. [Asteraceae]; UN-2	Japan nalou (T)	H	42	0.112	0.013	Lf	DIG-D	Dysentery	The fresh leaves are crushed to extract juice, then ingested to treat dysentery.	Oral
				T: 31 T: 11			Lf	MUS-L	Muscle ache	The leaves' crushed paste is topically applied to the cramp area to relieve aching.	Topical
4.	<i>Ageratum conyzoides</i> L. [Asteraceae]; LD-34	Khongsai meipu/Ru aibapu (R)	H	19	0.050	0.008	Lf	SKIN-S	Cuts	The fresh leaves are crushed into a paste, then smeared on the injured area and secured with a bandage to halt bleeding and promote wound healing.	Topical
				R: 12			Lf	DIG-D	Dysentery	The fresh leaves are crushed into juice and ingested to treat dysentery.	Oral
				R: 5			Lf	RES-R	Nose bleeding	The plant part is crushed into a paste, then applied to the nostril to stop the bleeding.	Nasal
5.	<i>Alocasia macrorrhizos</i> (L.) G.Don [Araceae]; LD-91	Khongnu (R)	H	3	0.008	0.005	Lf	SKIN-S	Cuts	The stem is crushed into a paste and applied to the wounded area, then secured with a bandage to stop bleeding and promote healing.	Topical
				R: 2			Lf	SKIN-S	Bee sting	The stem is crushed into a paste and smeared on the stung area to alleviate pain and remove the venom.	Topical
6.	<i>Alpinia galanga</i> (L.) Willd. [Zingiberaceae]; LD-211	Kenghu (R)	H	14	0.037	0.008	Rh	DIG-D	Piles	The fresh rhizome is chewed to alleviate piles and associated discomfort.	Oral
				R: 6 R: 5			Rh	SKIN-S	Ringworm	The fresh rhizome is crushed into a paste, then smeared on the infected area to treat ringworm.	Topical

				R:3			Rh	DIG-D	Toothache	The fresh rhizome is crushed into a juice and mixed with some water, then gargle to alleviate tooth and gum pain.	Gargle
7.	<i>Alpinia nigra</i> (Gaertn.) Burt [Zingiberaceae]; UN-35	Umkru (T)	H	1 T:1	0.002	0.002	Rh	DIG-D	Intestinal worm	The rhizome is soaked overnight, then the infusion is ingested to kill and expel intestinal worms in children.	Oral
8.	<i>Alpinia officinarum</i> Hance [Zingiberaceae]; LD-199	Thengsagu (R)	H	7 R:4 R:3	0.018	0.005	Rh	DIG-D	Intestinal worm	The rhizome is crushed to a paste and applied to the head of children to treat intestinal worms.	Topical
9.	<i>Aquilaria malaccensis</i> Lam. [Thymelaeaceae]; LD-192	Ghum (R)	T	5 R:2 R:3	0.013	0.005	HW	PRE-W	Difficulty in delivery	The heartwood chips are boiled with water; the decoction is ingested to relieve pain during childbirth.	Oral
							HW	DIG-D	Gastritis	The heartwood chips are boiled with water; the resulting decoction is ingested to alleviate gastric discomfort.	Oral
10.	<i>Artemisia keiskeana</i> Miq. [Asteraceae]; LD-63	Gankapeih (R)	H	49 R:29 R:13 R: 5 R:2	0.013	0.010	Lf	SKIN-S	Cuts	The leaves are crushed into juice and applied to the injured area to stop bleeding and promote wound healing.	Topical
							Lf	DIG-D	Dysentery	The leaves are crushed to extract juice and mixed with some water, then orally ingested to treat dysentery.	Oral
							Lf	RES-R	Nose bleeding	The fresh leaves are crushed into juice and administered as a nasal drop to halt nosebleeds.	Nasal
							Lf	RES-R	Sinusitis	The fresh leaves are crushed into juice and administered as a nasal drop to treat sinusitis	Nasal
11.	<i>Artocarpus heterophyllus</i> Lam. [Moraceae]; LD-102	Thaipuang (R)	T	3 R:3	0.008	0.002	T Lf	DIG-D	Dysentery	2-3 fresh tender leaves are chewed and ingested on an empty stomach to treat dysentery.	Oral
12.	<i>Asparagus racemosus</i> Willd. [Asparagaceae]; LD-235	Lunalangpai (R)	S	7 R: 7	0.018	0.002	WP	DIG-D	Gastritis	The whole plant is boiled with water, and the resulting decoction is ingested orally to relieve gastritis and discomfort	Oral
13.	<i>Bambusa tulda</i> Roxb. [Poaceae]; LD-141	Panglian g (R)	AG	10 R:10	0.026	0.002	Culm	SKIN-S	Cuts	The fresh culm is peeled and mixed with a few drops of water to create a paste. This paste is then applied externally and secured with cloth to halt bleeding and promote wound healing.	Topical
14.	<i>Berberis napaulensis</i> (DC.) Spreng. [Berberidaceae]; LD-148	Thingzin (R)	S	5 R: 5	0.013	0.002	Lf	DIG-D	Gastritis	The leaves are boiled with water, then the steam is collected in a wet cloth and gently massaged on the stomach to expel gases.	Massage
15.	<i>Biancaea sappan</i> (L.) Tod. [Fabaceae]; LD-133	Laiki (R)	T	4 R:2 R:2	0.010	0.005	Lf	DIG-D	Gastritis	The dried heartwood chips are boiled with water. The decoction is taken orally to relieve gastritis	Oral
							HW	URO-U	Kidney tonic	The dried heartwood chips are boiled with water. The decoction is taken orally to improve kidney function	Oral
16.	<i>Blumea balsamifera</i> (L.) DC. [Asteraceae]; UN-6	Yanang (T)	S	35 T: 13 T:13 T:9	0.093	0.008	Lf	MUS-L	Muscle ache	Fresh leaves are boiled in water; the steam is collected in a wet cloth and massaged over the aching area.	Massage
							Lf	MUS-L	Bone fracture	The leaves are roasted and crushed into a paste with a drop of water. The extract is topically applied over the fracture area and tie with a cloth to set the broken bone	Topical
							Lf	SKIN-S	Contusion	The leaves are roasted and crushed into a paste. The extract is topically applied to promote healing.	Topical
17.	<i>Blumea flava</i> DC. [Asteraceae]; LD-232	Houchak (R)	H	1 R:1	0.002	0.002	Lf	NEU-N	Headache	The blanched leaves are pounded into a paste and topically applied to the forehead to relieve headache	Topical
18.	<i>Blumea lanceolaria</i> (Roxb.) Druce [Asteraceae]; LD-81	Thuaihpuang (R)	H	34 R:3 R:4 R:2	0.064	0.010	Lf	SKIN-S	Infection	The fresh leaves are boiled with water; the decoction is used to bathe to treat any skin infection type.	Bathing
							Lf	URO-U	Kidney tonic	The fresh tender leaves are chewed, or a decoction is ingested to improve kidney function	Oral
							Lf	DIG-D	Liver tonic	The fresh leaves are directly chewed, or a decoction is ingested to improve liver health.	Oral

				R:25			Lf	BLD-B	Spleen problem	The fresh are directly chewed or a decoction is administered orally to treat any spleen-related ailments.	Oral
19.	<i>Boesenbergia longiflora</i> (Wall.) Kuntze [Zingiberaceae]; LD-51	Gakhiang (R)	H	22 R:3	0.058	0.005	Rh	DIG-D	Gastritis	The fresh rhizome is boiled with water; the resulting steam is collected in a wet cloth, then massaged over the back and stomach to alleviate gastritis.	Massage
				R:19			Rh	DIG-D	Stomachache	The fresh rhizome is chewed and ingested, or crushed paste is topically applied to the stomach to alleviate gastritis	Oral, Topical
20.	<i>Brassaiopsis glomerulata</i> (Blume) Regel [Araliaceae]; UN-8, LD-58	Tokpabu (T)	S	203 T:65 T:45 T:31 T:40	0.544	0.013	Lf	URO-U	Kidney problems	The tender leaves are either cooked as a vegetable or prepared as a decoction and ingested to treat any kidney ailment.	Oral
							Lf	CAR-K	Hypertension	The fresh leaves are prepared as a decoction and ingested to manage hypertension.	Oral
							Lf	RES-R	Asthma	The leaves are prepared as a decoction and ingested to treat asthma.	Oral
							Lf	MET-T	Diabetes	The leaves are prepared as a decoction and ingested to control diabetes and blood sugar.	Oral
		Laideawn a (R)		R:22			Lf	URO-U	Kidney problems	The leaves are cooked as a vegetable or prepared into a decoction and ingested to treat any kidney ailment.	Oral
21.	<i>Brugmansia suaveolens</i> (Humb.) & Bonpl. ex Willd.) [Solanaceae]; UN-70	Phringkzi (T)	S	4 T:4	0.010	0.002	Lf	SKIN-S	Cuts & wounds	The fresh leaves are crushed into a paste and applied topically on wounded area to promote healing and prevent infection.	Topical
22.	<i>Butea buteiformis</i> (Voigt) Grierson [Fabaceae]; LD-214	Chakhu rhui (R)	S	1 R:1	0.002	0.002	Seed	DIG-D	Intestinal worm	The mature seed is roasted and administered orally to expel intestinal worms in children	Oral
23.	<i>Callicarpa arborea</i> Roxb. [Lamiaceae]; LD-113	Sim (R)	S	8 R:7 R:1	0.021	0.005	Lf	DIG-D	Gastritis	The fresh leaves are boiled with water, and the resulting decoction is orally ingested to alleviate gastritis discomfort.	Oral
							Lf	EYE-F	Cataract	The fresh leaves are crushed into juice and used as eye drop to treat cataracts.	Ophthalmic
24.	<i>Carallia brachiata</i> (Lour.) Merr. [Rhizophoraceae]; LD-154	Guinathai (R)	T	7 R:7	0.018	0.002	Fr	BLD-B	Improves Blood Circulation	The fresh fruits are eaten raw, believed to improve blood circulation, as reported by informants	Oral
25.	<i>Careya arborea</i> Roxb. [Lecythidaceae]; UN-81	Thukthur (T)	T	8 T:8	0.021	0.002	Lf & Bark	DIG-D	Diarrhoea	The plant parts are boiled with water, and the decoction is ingested orally to treat diarrhoea	Oral
26.	<i>Centella asiatica</i> (L.) Urb. [Apiaceae]; UN-10, LD-31	Ensangphur (T)	H	73 T:7 T:2	0.196	0.024	WP	DIG-D	Stomach ulcer	The whole plant is prepared as a decoction and administered orally for the treatment of a stomach ulcer	Oral
							WP	NEU-N	Seizure	The whole plant is crushed to extract juice, mixed with some honey, and administered orally for the treatment of seizures	Oral
		Kuaklei (R)		R:1			WP	NEU-N	Brain tonic	The plant part is crushed into juice, then mixed with a few drops of honey. The resulting extract is ingested to improve memory.	Oral
				R:24			WP	SKIN-S	Cuts	The whole plant is crushed into a paste and applied topically to halt bleeding.	Topical
				R:2			WP	CAR-K	Hypertension	The whole plant is either crushed into juice, then mixed with a few drops of honey, or boiled in water; the resulting extract is ingested to maintain hypertension.	Oral
				R:26			WP	DIG-D	Stomachache	The whole plant is prepared as a decoction and administered orally to relieve stomachache.	Oral
				R:3			WP	URO-U	Stone case	The whole plant is prepared as a decoction with rock sugar, administered orally to treat calculi.	Oral

				R:1			WP	DIG-D	Typhoid	The plant is crushed to obtain juice, which is administered orally to cure typhoid.	Oral
				R:7			WP	URO-U	UTI	The whole plant is crushed to obtain juice, then administered orally to treat Urinary tract infection.	Oral
27.	<i>Cinnamomum verum</i> J.Presl [Lauraceae]; LD-187	Mansugi (R)	T	10 R:4 R:5	0.027	0.008	Bark	MET-T	Cholesterol	The bark is boiled in water to prepare a decoction, which is then ingested to manage the cholesterol level.	Oral
				R:1			Bark	SKIN-S	Ringworm	The bark is dried, powdered, mixed with honey, and applied topically to the infected area.	Topical
							Bark	DIG-D	Toothache	The bark is dried, powdered, mixed with local salt, and applied buccally to relieve toothache.	Buccal
28.	<i>Cissus adnata</i> Roxb. [Vitaceae]; UN-3, LD-46	Ngasam (T)	C	67 T:25 T:22	0.179	0.013	Root	SKIN-S	Cuts	The root is crushed into juice, then poured on the wound area to halt bleeding and promote healing.	Topical
							Root	SKIN-S	Septic wounds	The roots are prepared as a decoction and poured to heal the wound.	Topical
		Luairuap (R)		R:1			Lf	SKIN-S	Skin allergy	The leaves are crushed to obtain juice and applied topically to the infected area to alleviate the allergy.	Topical
				R:8			Lf	SKIN-S	Boils	The leaves are roasted, then crushed into a paste and applied topically on the infected area to lessen the boils.	Topical
				R:11			Lf	URO-U	Stone case	The leaves are prepared as a decoction with rock sugar, mixed with a drop of monkey urine, and administered orally to treat calculi	Oral
29.	<i>Clerodendrum colebrookeanum</i> Walp. [Lamiaceae]; LD-68, UN-7	Ganmakhui (R) Phyungbu (T)	S	60 R:2 R:31 T:27	0.160	0.005	Lf	MET-T	Diabetes	The leaves are cooked as a vegetable or prepared as a decoction and administered orally to manage diabetes.	Oral
							Lf	CAR-K	Hypertension	The leaves are cooked as a vegetable, or a decoction prepared by boiling in water is ingested to regulate hypertension.	Oral
30.	<i>Coix lacryma-jobi</i> L. [Poaceae]; LD-179	Tadiang (R)	S	2 R:1 R:1	0.005	0.005	Lf	URO-U	Stone case	The leaves are prepared as a decoction with rock sugar and administered orally to treat calculi.	Oral
							Lf	FEM-X	White discharge	The leaves are prepared as a decoction with rock sugar and administered orally to treat white discharge.	Oral
31.	<i>Crassocephalum crepidioides</i> (Benth.) S.Moore [Asteraceae]; UN-45, LD-134	Terapaibi (T) Puking/Kambuipu/Jadonangpu (R)	H	66 T:20 R:2	0.177	0.013	Lf	DIG-D	Gastritis	The leaves are crushed to obtain juice and administered orally to alleviate gastritis and abdominal discomfort.	Oral
							Lf	DIG-D	Gastritis	The leaves are crushed to obtain juice and administered orally to alleviate gastritis and abdominal discomfort.	Oral
				R:20			Lf	SKIN-S	Cuts	The leaves are crushed into a paste and applied topically to the injured area to halt bleeding and promote healing	Topical
				R:8			Lf	CAR-K	Hypertension	The leaves are crushed to obtain juice and administered orally to reduce hypertension.	Oral
				R:16			Lf	DIG-D	Stomachache	The leaves are crushed to obtain juice and administered orally to relieve stomachache.	Oral
32.	<i>Chromolaena odorata</i> (L.) R.M.King & H.Rob. [Asteraceae]; LD-96	Puthan (R)	H	54 R:44	0.145	0.008	Lf	SKIN-S	Cuts	The leaves are crushed into a paste and applied topically to the injured area and tied with a cloth to halt bleeding and promote healing.	Topical
				R:9			Lf	DIG-D	Diarrhoea	The leaves are crushed to obtain juice and ingested orally to treat diarrhoea.	Oral
				R:1			Lf	DIG-D	Piles	The leaves are crushed to obtain juice and administered orally to treat piles	Oral

33.	<i>Croton caudatus</i> Geiseler [Euphorbiaceae]; LD-145	Houbuml uai (R)	C	3 R:3	0.008	0.002	Lf	SKIN-S	Cuts	The leaves are crushed into a paste and applied topically to the injured area, and tied with a cloth to halt bleeding and promote healing.	Topical
34.	<i>Cucumis metuliferus</i> Jacques [Cucurbitaceae]; LD-95	Ruaithapi (R)	C	9 R:4 R:5	0.024	0.005	WP	DIG-D	Jaundice	The whole plant is prepared as a decoction with rock sugar and administered orally to treat jaundice.	Oral
							WP	URO-U	Stone case	The whole plant is prepared as a decoction with rock sugar and administered orally to treat calculi	Oral
35.	<i>Curcuma amada</i> Roxb. [Zingiberaceae]; LD-87	Bah-ga (R)	H	6 R:2 R:4	0.016	0.005	Rh	DIG-D	Gastritis	The fresh rhizomes are prepared as steam therapy and applied through massage to alleviate gastritis.	Massage
							Rh	DIG-D	Stomachache	The fresh rhizomes are consumed to relieve stomachache.	Oral
36.	<i>Curcuma caesia</i> Roxb. [Zingiberaceae]; LD-188	Gazing (R)	H	30 R:2 R:28	0.080	0.005	Rh	DIG-D	Gastritis	The fresh rhizomes are boiled with water; the steam is collected in a wet cloth, then mildly massaged over the belly to relieve gastritis.	Massage
							Rh	DIG-D	Stomachache	The rhizomes are eaten raw or crushed into a paste and applied topically to relieve stomachache.	Oral, Topical
37.	<i>Curcuma comosa</i> Roxb. [Zingiberaceae]; LD-162	Chagaim eiga (R)	H	24 R:2 R:22	0.064	0.005	Rh	DIG-D	Gastritis	The fresh rhizomes are prepared as steam therapy and applied through massage to relieve gastritis.	Massage
							Rh	DIG-D	Stomachache	The rhizomes are consumed raw or crushed into a paste and applied topically to relieve stomachache	Oral, Topical
38.	<i>Curcuma zanthorrhiza</i> Roxb. [Zingiberaceae]; LD-52	Gamakhu ang (R)	H	38 R:8 R:2 R:2 R:26	0.101	0.010	Rh	MUS-L	Bodyache	The fresh rhizomes are crushed to obtain juice, mixed with honey, and administered orally to alleviate bodyache	Oral
							Rh	DIG-D	Gastritis	The fresh rhizomes are prepared as steam therapy and applied through massage to relieve gastritis.	Massage
							Rh	DIG-D	Intestinal worm	The fried rhizomes are dried, powdered, mixed with honey, and administered orally to expel intestinal worms.	Oral
							Rh	DIG-D	Stomachache	The fresh rhizomes are chewed and ingested to relieve a stomachache.	Oral
39.	<i>Cynodon dactylon</i> (L.) Pers. [Poaceae]; LD-89	Samprir a (R)	H	24 R:4 R:9 R:4 R:2 R:1 R:3 R:1	0.064	0.018	WP	GEN-A	Fever	The whole plant is prepared as a decoction and applied topically to reduce fever.	Topical
							WP	DIG-D	Gastritis	The whole plant is prepared as a decoction and administered orally to relieve gastritis.	Oral
							WP	DIG-D	Piles	The whole plant is crushed to obtain juice and administered orally to treat piles and associated discomfort.	Oral
							WP	DIG-D	Intestinal worm	The whole plant is crushed into a paste and applied topically to the belly to treat intestinal worms.	Topical
							WP	RES-R	Sinusitis	The whole plant is prepared as steam therapy and inhaled to treat sinusitis.	Inhale
							WP	DIG-D	Stomachache	The whole plant is crushed to obtain juice, mixed with honey and water, and administered orally to relieve stomachache.	Oral
							WP	FEM-X	White discharge	The whole plant is prepared as a decoction with rock sugar and administered orally to treat white discharge.	Oral
40.	<i>Dimetia scandens</i> (Roxb.) R.J.Wang [Rubiaceae]; LD-176	Hurim (R)	H	11 R:2 R:9	0.029	0.005	Lf	URO-U	Stone case	The leaves are prepared as a decoction with rock sugar and administered orally to treat calculi	Oral
							Lf	URO-U	Urinary problem	The leaves are prepared as a decoction and administered orally against any urinary trouble.	Oral

41.	<i>#Diplazium esculentum</i> (Retz.) Sw. [Polypodiaceae]; LD-136	Kokaduan (R)	H	2 R:2	0.005	0.002	Frond	SKIN-S	Bee sting	The fronds are crushed into a paste and applied topically to the bitten area to alleviate the pain and remove the sting.	Topical						
42.	<i>Drymaria cordata</i> (L.) Wild. ex Schult [Caryophyllaceae]; UN-40	Ramsina (T)	H	14 T:14	0.037	0.002	Lf	GEN-A	Fever in children	The leaves are crushed into a paste and applied topically throughout the body to reduce fever	Topical						
43.	<i>Drymaria diandra</i> Blume [Caryophyllaceae]; LD-164	Pepe (R)	H	12 R:7	0.032	0.008	Lf	DIG-D	Intestinal worm	The leaves are crushed into a paste and applied topically on the head to treat intestinal worms.	Topical						
				R:1			Lf	GEN-A	Hiccup	The leaves are crushed into a paste and applied topically to the throat to cure hiccups.	Topical						
				R:4			Lf	RES-R	Sinusitis	The leaves are crushed to obtain juice for nasal application or prepared as steam therapy and inhaled to cure sinusitis.	Nasal, inhale						
44.	<i>*Elsholtzia blanda</i> (Benth.) Benth. [Lamiaceae]; UN-27, LD-243	Mailing (T) Lengtu (R)	H	18 T:17	0.048	0.005	Lf	DIG-D	Gas problems	The leaves are consumed raw with some honey to expel gases.	Oral						
				R:1			Lf	RES-R	Tonsillitis	The leaves are prepared as a decoction and administered orally for treating tonsillitis.	Oral						
45.	<i>Entada rheedei</i> Spreng. [Fabaceae]; LD-150	Garing (R)	C	7 R:1	0.018	0.005	Lf	SKIN-S	Cuts	The leaves are crushed into a paste and applied topically to halt bleeding and promote healing	Topical						
				R:6			Lf	MUS-L	Sprain	The leaves are crushed into a paste with a little salt and applied topically to relieve sprains	Topical						
46.	<i>Equisetum ramosissimum</i> Desf. [Equisitaceae]; LD-45	Rapeicheng (R)	H	2 R:1	0.005	0.005	Stem	DIG-D	Gastritis	The fresh stem is steamed and applied by massage for the treatment of gastritis.	Massage						
				R:1			Stem	URO-U	Stone case	The stem is prepared as a decoction with rock sugar and administered orally for the treatment of stone cases.	Oral						
47.	<i>Erigeron canadensis</i> L. [Asteraceae]; UN-103	Pungman (T)	H	9 T:9	0.024	0.005	Lf	SKIN-S	Cut & wound	The leaves are crushed into a paste applied topically to halt bleeding and promote wound healing.	Topical						
48.	<i>*Eryngium foetidum</i> L. [Apiaceae]; LD-201	Maruaidahpui (R)	H	27 R:1	0.072	0.021	Lf	MET-T	Diabetes	The leaf is crushed to extract juice or consumed raw and administered orally for the treatment of diabetes.	Oral						
				R:12			Lf	CAR-K	Hypertension	The leaves are either crushed into paste, crushed to extract juice, or consumed raw and administered orally to manage hypertension.	Oral						
				R:2			Lf	RES-R	Nose bleeding	The leaves are crushed into a paste and applied with cotton for the treatment of nosebleeds.	Nasal						
				R:1			Lf	RES-R	Tonsillitis	The leaves are prepared as a decoction and administered orally for the treatment of tonsillitis	Oral						
				R:2			Root	GEN-A	Chicken pox	The root is crushed to extract juice and administered orally for the treatment of chickenpox.	Oral						
				R:2			Root	RES-R	Cough	The root is crushed to extract juice and administered orally to relieve a cough.	Oral						
				R:4			Root	NEU-N	Numbness & Tingling sensation	The root is fried with salt and applied topically to alleviate numbness and tingling sensations	Topical						
				R:3			Root	DIG-D	Stomachache	The root is crushed to extract juice, mixed with a little water, and administered orally for the treatment of stomachache and discomfort	Oral						
				49.			<i>Erythrina stricta</i> Roxb. [Fabaceae]; LD-251	Ta-Hengmei (R)	T	2 R:2	0.005	0.002	Bark	SKIN-S	Boils	The bark is boiled into a paste and applied topically for the treatment of boils and as an antiseptic.	Topical

50.	<i>*Erythrina variegata</i> L. [Fabaceae]; UN-108, LD-50	Kurao angouba (T) Ta-bengmei (R)	T	22	0.058	0.016	Bark	NEU-N	Headache	The bark is crushed into a paste and applied topically to the forehead for the treatment of headache.	Topical
				T:1			Bark	SKIN-S	Boils	The bark is boiled, then crushed into a paste and applied topically to lessen boils.	Topical
				R:2			Lf	SKIN-S	Boils	The leaf is roasted and applied topically to lessen boils.	Topical
				R:2			HW	GEN-A	Evil spirit	The heartwood is made into beads and worn around the waist and wrist for protection against evil spirits.	Wear
				R:5			HW	DIG-D	Gastritis	The heartwood is prepared as a decoction and administered orally or applied topically for the treatment of gastritis.	Oral, Topical
				R:7			HW	GEN-A	Fever	The heartwood is prepared as a decoction with some salt and administered orally for the treatment of fever.	Oral
				R:5							
51.	<i>Eupatorium cannabinum</i> L. [Asteraceae]; LD-191	Lenglei (R)	H	25	0.067	0.013	Lf	EAR-H	Earache	The leaves are crushed to extract juice and applied as ear drop for the treatment of earache.	Auricular
				R:6			Lf	GEN-A	Fever	The leaves are crushed to extract juice or crushed into a paste and administered orally or applied topically for the treatment of fever.	Oral or topical
				R:11			Lf	DIG-D	Stomachache	The fresh leaves are consumed raw or crushed to extract juice and administered orally to relieve stomachache.	Oral
				R:5			Lf	FEM-X	White Discharge	The leaf is crushed to extract juice, mixed with local salt, and administered orally for the treatment of white discharge, as reported by informants.	Oral
				R:2			Lf	URO-U	Urinary problem	The fresh leaves are crushed to extract juice and administered orally for the treatment of urinary problems	Oral
				R:1			WP	FEM-X	Menstrual cramp	The whole plant is prepared as a decoction and administered orally to relieve menstrual cramps.	Oral
							WP	URO-U	Stone case	The whole plant is prepared as a decoction with rock sugar and administered orally to remove calculi in the urinary tract.	Oral
52.	<i>Euphorbia hirta</i> L. [Euphorbiaceae]; LD-135	Nouduthai (R)	H	8	0.021	0.008	WP	FEM-X	White discharge	The whole plant (WP) is prepared as a decoction with rock sugar and administered orally for treating white discharge.	Oral
				R:5							
				R:2							
				R:1							
53.	<i>*Eurya acuminata</i> DC. [Pentaphylacaceae]; UN-16, LD-80	Thingparshib (T) Thingmaning (R)	T	26	0.069	0.008	Lf	DIG-D	Dysentery	The leaves are prepared as a decoction and administered orally to treat dysentery.	Oral
				T:5			Root	MET-T	Diabetes	The fresh root is consumed on an empty stomach to manage diabetes.	Oral
				T:14			Lf	MET-T	Diabetes	The leaves are prepared as a decoction and administered orally to manage diabetes	Oral
				R:7							
54.	<i>*Ficus auriculata</i> Lour. [Moraceae]; LD-37	Bu-jik (R)	T	11	0.029	0.005	T Lf	PRE-W	Lactation	The tender leaves are cooked and served as a vegetable, mainly taken orally by women in the postpartum period to improve lactation.	Oral
				R:8			T Lf	MET-T	Diabetes	The tender leaves are cooked as a vegetable or prepared as a decoction and administered orally to manage diabetes.	Oral
				R:3							
55.	<i>*Garcinia indica</i> (Thouars) Choisy [Clusiaceae]; UN-19	Theithit (T)	T	15	0.040	0.002	Fr-Sap	SKIN-S	Skin irritation	The fresh fruit sap is applied topically to relieve skin irritation.	Topical
56.	<i>*Garcinia pedunculata</i> Roxb. ex-Buch.-Ham. [Clusiaceae]; UN-48, LD-74	Changneira (T) Puanghthai (R)	T	35	0.093	0.013	Fr	MUS-L	Muscle ache	The fruits are cooked and made into a paste, which is then applied topically to relieve muscle ache.	Topical
				T:11			Fr	SKIN-S	Contusion	The fruits are boiled into a paste and applied topically to lessen the contusion.	Topical
				R:6							

				R:6			Fr	MUS-L	Sprain	The fruits are crushed into a paste and applied topically to treat muscle sprain.	Topical
				R:8			Fr	URO-U	Stone case	The fruits are prepared as a decoction with rock sugar and administered orally to treat calculi in the urinary tract.	Oral
				R:4			Fr	GEN-A	Unknown swelling	The fruits are crushed into a paste and applied topically to lessen unknown body swelling.	Topical
57.	<i># Gnetum gnemon</i> L. [Gnetaceae]; UN-1	Anilbu (T)	S	1 T:1	0.093	0.002	Lf	DIG-D	Aids in bowel movement	The leaves are cooked as a vegetable and administered orally to aid bowel movement and improve constipation	Oral
58.	<i>Goniothalamus sesquipedalis</i> (Colebr. ex-Wall.) Hook.f. & Thomson [Annonaceae]; LD-20	Khaamv (R)	S	104 R:89	0.278	0.008	Lf	GEN-A & DIG-D	Fever, evil spirit & gastritis	The dried leaves are burnt, and smoke is inhaled to treat fever and ward off evil spirits. The leaves' burnt ash is mixed with water and ingested to treat gastritis and associated discomfort	Inhale, oral
				R:15			Lf	DIG-D	Gastritis	The leaves are prepared as a decoction or used in steam therapy, and administered orally or massaged to relieve gastritis discomfort.	Oral, massage
59.	<i># Gymura bicolor</i> (Roxb. ex Willd.) DC. [Asteraceae]; LD-01	Gandian (R)	H	10 R:10	0.026	0.002	Lf	DIG-D	Stomachache	The leaves are consumed raw or cooked and administered orally to alleviate stomachache.	Oral
60.	<i>*Hellenia speciosa</i> (J.Koenig) S.R.Dutta [Costaceae]; LD-178; UN-41	Zimmathi ang (R) Sangsril (T)	H	11 R:1	0.029	0.008	Stem	EYE-F	Eye injury	The stem is crushed to extract juice, which is then applied as an eye drop to treat eye injuries.	Ophthalmic
				T: 3			Rh	DIG-D	Jaundice	The rhizome is prepared as a decoction and administered orally to cure jaundice.	Oral
				T: 7			Rh	RES-R	Sinusitis	The rhizome is crushed with some pure mustard oil into a paste and applied on the nostrils to cure sinusitis.	Nasal
61.	<i>Helixanthera parasitica</i> Lour. [Loranthaceae]; LD-112	Tamsuan (R)	E	15 R:1	0.040	0.005	Lf	EYE-F	Cataract	The leaves are crushed to obtain juice and applied as an eye drop to treat cataracts.	Ophthalmic
				R:14			Lf	DIG-D	Gastritis	The leaves are prepared as a decoction and administered orally, or used in steam therapy and massaged.	Oral, massage
62.	<i>*Heptapleurum ellipticum</i> (Blume) Seem. [Araliaceae]; UN-53, LD-29	Blang (T)	S	66 T:7	0.177	0.013	Lf	GEN-A	Evil spirits	The leaves are crushed into a paste with mustard oil, local egg, and cloves of garlic, and applied topically throughout the body to ward off evil spirits.	Topical
		Tarhang (R)		R:5			Lf	RES-R	Breathing Problem	The leaves are prepared as a decoction with rock sugar and administered orally to alleviate breathing difficulties.	Oral
				R:1			Lf	RES-R	Cough & cold	The leaves are prepared as a decoction and administered orally to relieve cough & cold	Oral
				R:9			Lf	GEN-A	Fever	The leaves are prepared as a decoction with a pinch of salt and administered orally or applied topically over the body to reduce fever.	Oral, topical
				R:44			Lf	DIG-D	Gastritis	The leaves are prepared as a decoction and administered orally or applied topically to alleviate gastritis and associated discomfort.	Oral, Topical
63.	<i>Hiptage benghalensis</i> (L.) Kurz [Malpighiaceae]; LD-122	Roupabang (R)	S	6 R:3	0.016	0.005	Stem	MUS-L	Bone fracture	The stem is macerated and crushed to a paste, then topically applied and secured with a bandage to set the fractured bone.	Topical
				R:3			Stem	SKIN-S	Burns	The stem is macerated and crushed to a paste, then applied topically to heal the skin burns.	Topical
64.	<i>*Homonoia riparia</i> Lour. [Euphorbiaceae]; LD-195	Ganmajung (R)	S	1 R:1	0.002	0.002	Lf	FEM-X	White Discharge	The leaves are prepared as a decoction with rock sugar and administered orally to treat white discharge.	Oral

65.	<i>Justicia adhatoda</i> Mart. ex Nees [Acanthaceae]; UN-109	Kyophlup (T)	S	4 T:4	0.010	0.002	Lf	MUS-L	Muscleache	The leaves are prepared as a decoction and applied topically to relieve muscle ache	Topical
66.	<i>Hydrocotyle javanica</i> Thunb. [Apiaceae]; LD-99	Ra-gankuakl ei (R)	H	10 R:6 R:4	0.027	0.005	WP	DIG-D	Stomachache	The whole plant is crushed to obtain juice and administered orally to relieve stomachache.	Oral
							WP	URO-U	Stone case	The whole plant is prepared as a decoction with rock sugar and administered orally to treat calculi.	Oral
67.	<i>Kaempferia galanga</i> L. [Zingiberaceae]; LD-177	Galam (R)	H	19 R:17 R:2	0.050	0.005	Rh	GEN-A & DIG-D	Evil Spirit & Gastritis	The rhizomes are either consumed raw or crushed into a paste, prepared as a decoction, then administered orally or applied topically to ward off evil spirits and relieve gastritis.	Oral, topical
							Rh	DIG-D	Stomachache	The rhizome is either consumed raw or crushed into a paste and applied topically to relieve stomachache.	Oral, topical
68.	<i>Lantana camara</i> L. [Verbenaceae]; LD-246	Manjuri (R)	S	7 R:1 R:6	0.018	0.005	Lf	RES-R	Cough	The leaves are prepared as a decoction and administered orally to cure a cough.	Oral
							Lf	DIG-D	Diarrhoea	The leaves are crushed to extract juice, which is then ingested to treat diarrhoea.	Oral
69.	<i>Lasianthus cyanocarpus</i> Jack [Rubiaceae]; LD-98	Thingbanam (R)	T	37 R:2 R:35	0.099	0.005	Lf	MUS-L	Bone fracture	The leaves are crushed into a paste and applied to the fracture area and secured with a cloth to set the fractured bone.	Topical
							Lf	DIG-D	Gastritis	The leaves are prepared as a decoction and administered orally or applied topically to alleviate gastritis.	Oral, Topical
70.	<i>Leucas aspera</i> (Willd.) Link [Lamiaceae]; LD-60	Sinuspu (R)	H	15 R:6 R:9	0.040	0.005	Lf	RES-R	Asthma	The leaves are prepared as a decoction and ingested to cure asthma and breathing difficulties.	Oral
							Lf	RES-R	Sinusitis	The leaves are crushed to extract juice and administered as a nasal drop to cure sinusitis.	Nasal
71.	<i>Lobelia nummularia</i> Lam. [Campanulaceae]; LD-227	Guaitu (R)	H	1 R:1	0.002	0.002	Lf	URO-U	Stone case	The leaves are prepared as a decoction with rock sugar and administered orally to treat calculi in the urinary tract.	Oral
72.	<i>Malus indica</i> (Wall.) B.B.Liu [Rosaceae]; LD-08	Phakthai (R)	T	2 R:1 R:1	0.005	0.005	Lf	SKIN-S	Skin allergy	The leaves are crushed into a paste and applied topically to alleviate allergies and itching.	Topical
							Lf	SKIN-S	Burns, Cuts & wounds	The plant part is crushed into a paste and applied topically to heal the wound and halt bleeding.	Topical
73.	<i>Maesa chisia</i> D.Don [Primulaceae]; LD-157	Parin (R)	S	6 R:4 R:2	0.016	0.005	Lf	EYE-F	Cataract	The leaves are crushed to extract juice and applied as an eye drop to cure cataracts.	Ophthalmic
							Lf	DIG-D	Gastritis	The leaves are prepared as a decoction and ingested to relieve gastritis.	Oral
74.	<i>Melastoma malabathricum</i> L. [Melastomataceae]; LD-156	Tunazou buang (R)	S	8 R:5 R:3	0.021	0.005	Lf	MET-T	Diabetes	The leaves are prepared as a decoction with rock sugar and administered orally to manage diabetes.	Oral
							Lf	DIG-D	Gastritis	The leaves are prepared as a decoction and ingested orally to alleviate gastritis.	Oral
75.	<i>Melia azedarach</i> L. [Meliaceae]; LD-206	Moukang (R)	T	2 R:2	0.005	0.002	Bark	DIG-D	Intestinal worm	The bark is prepared as a decoction and administered orally to expel intestinal worms.	Oral
76.	<i>Meyna spinosa</i> Roxb. ex Link [Rubiaceae]; LD-127	Kanungh (R)	T	2 R:1 R:1	0.002	0.005	Fr	SKIN-S	Skin moisturizer	The fruits are crushed to extract juice and applied topically to moisturize the skin.	Topical
							Seed	DIG-D	Intestinal worm	The seed is roasted and administered orally to expel intestinal worms.	Oral
77.	<i>Mikania micrantha</i> Kunth [Asteraceae]; LD-36	Nagapulai (R)	C	106 R:98 R:7	0.284	0.008	Lf	SKIN-S	Cuts & wounds	The leaves are crushed to a paste and applied topically to halt bleeding.	Topical
							Lf	DIG-D	Dysentery	The leaves are crushed to extract juice, mixed with honey, and ingested orally to cure dysentery.	Oral

				R:1			Lf	SKIN-S	Snake bite (Water snake)	The crushed leaves paste is topically applied to halt bleeding.	Topical
78.	* <i>Mimosa pudica</i> L [Fabaceae]; UN-107, LD-48	Ekaithibi (T) Meijakpe i (R)	H	32 T:12 R:5 T:2 R:1 R:2 R:3 R:7	0.086	0.018	WP	URO-U	Kidney stones	The leaves are prepared as a decoction and ingested to treat renal calculi.	Oral
							WP	URO-U	Stone case	The leaves are prepared as a decoction with rock sugar and ingested orally to treat a stone case.	Oral
							WP	DIG-D	Toothache	The whole is prepared as a decoction and ingested to alleviate toothache.	Oral
							WP	MET-T	Diabetes (stage 1)	The plant is prepared as a decoction and ingested to treat diabetes and regulate blood sugar.	Oral
							WP	DIG-D	Piles	The whole plant is prepared as a decoction and poured into a tub and sat to treat piles and itching discomfort.	Sitz bath
							WP	DIG-D	Tongue ulcer	The whole plant is crushed to extract juice, mixed with honey, and administered on the tongue to cure an ulcer.	Translingual
							WP	FEM-X	White discharge	The whole plant is prepared either as a decoction with rock sugar or as a plain decoction, and administered orally or used as an intimate wash to cure white discharge.	Oral, intimate wash
79.	* <i>Momordica charantia</i> L. [Cucurbitaceae]; LD-248	Khanathi (R)	C	2 R:2	0.005	0.002	Lf	MET-T	Diabetes	The leaves are prepared as a decoction and ingested orally to manage diabetes.	Oral
80.	<i>Morinda tomentosa</i> B.Heyne ex Roth [Rubiaceae]; UN-36	Nongna (T)	S	6 T:6	0.016	0.002	Lf	SKIN-S	Ringworm and boils	The leaves are crushed to a paste, then applied to the infected to cure ringworm and lessen the boils.	Topical
81.	* <i>Musa balbisiana</i> Colla [Musaceae]; LD-92, UN-38	Hao (R) Matfui (T)	H	21 R:2 R:2 R:2 R:7 R:1 R:3 T:2 R:1 T:1	0.056	0.024	Pseudo-stem	SKIN-S	Boils	The plant part is crushed into a paste; the decayed pseudo-stem is mixed with ash and applied topically to lessen the boils.	Topical
							Pericarp	SKIN-S	Mosquito bite	The fruit pericarp is crushed into a paste and applied topically to alleviate rashes and itching.	Topical
							Inf	DIG-D	Constipation	The inflorescence is cooked as a vegetable and administered orally to treat constipation.	Oral
							Inf	DIG-D	Dysentery	Raw inflorescence is consumed to treat dysentery.	Oral
							Inf	PRE-W	Lactation	Inflorescence is cooked as a vegetable to improve lactation during the postpartum period.	Oral
							Inf	GEN-A	Malaria	Inflorescence is cooked as a vegetable to improve health conditions and the immune system.	Oral
							Inf	GEN-A	Malaria	The inflorescence is eaten as a cooked vegetable to improve health and the immune system.	Oral
							Inf	DIG-D	Tongue ulcer	The fresh inflorescence is sliced and applied on the tongue to cure an ulcer.	Translingual
							Inf	DIG-D	Diarrhoea	The fresh inflorescence sap is mixed with some honey and ingested orally to halt severe diarrhoea.	Oral
82.	<i>Mussaenda glabra</i> Vahl [Rubiaceae]; LD-142	Raphei palikna (R)	C	15 R:7 R:8	0.040	0.005	Lf	SKIN-S	Boils	The leaves are roasted, made into a paste, and applied topically to lessen boils.	Topical
							Lf	GEN-A	Unknown swelling	The leaves are roasted, made into a paste, and applied topically over the body to lessen body swelling.	Topical
83.	<i>Mussaenda roxburghii</i> Hook.f. [Rubiaceae]; LD-140	Raphei (R)	S	20 R:11	0.053	0.008	Lf	SKIN-S	Boils	The leaves are crushed into a paste and then applied externally to the affected area to reduce the presence of boils.	Topical

84.	<i>Nicotiana tabacum</i> L. [Solanaceae]; LD-137	Makhou (R)	H	R:2	0.046	0.008	Lf	DIG-D	Gastritis	The leaves are prepared into a decoction and ingested orally to cure gastritis discomfort.	Topical
				R:7			Lf	MUS-L	Unknown bodyache	The leaves are prepared as a decoction and applied topically to relieve unknown bodyache.	Topical
				17 R:2			Lf	SKIN-S	Skin allergy	The leaves are crushed to extract juice, then topically applied to alleviate allergies and itching.	Topical
				R:7			Lf	SKIN-S	Boils	The leaves are roasted and made into a paste, and topically applied to lessen boils.	Topical
85.	<i>Oenanthe javanica</i> (Blume) DC. [Apiaceae]; LD-02	Kaam (R)	H	R:8	0.008	0.002	Lf	DIG-D	Toothache	The leaves are crushed to extract juice, which is then applied buccally to alleviate toothache.	Buccal
				3 R:3			WP	DIG-D	Stomachache	The whole plant is consumed either cooked or raw to relieve a stomachache.	Oral
86.	<i>Oroxylum indicum</i> (L.) Kurz [Bignoniaceae]; UN-5, LD-24	Baklung (T) Zeipai (R)	T	36 T:18	0.096	0.016	Bark	DIG-D	Jaundice	The bark is prepared as a decoction and administered orally to cure jaundice.	Oral
				R:4			Bark	DIG-D	Diarrhoea	The bark is prepared as a decoction and ingested to cure diarrhoea.	Oral
				R:3			Bark	MET-T	Diabetes	The bark is prepared as a decoction and administered orally to manage diabetes.	Oral
				R:8			Bark	DIG-D	Dysentery	The bark is prepared as a decoction and administered orally to cure dysentery.	Oral
				R:1			Bark	DIG-D	Piles	The bark is prepared as a decoction and administered orally to cure piles and associated discomfort.	Oral
				R:2			Bark	SKIN-S	Skin irritation	The bark is processed into a decoction and utilized in a bath to relieve skin irritation and itching.	Bath
87.	<i>Oxalis corniculata</i> L. [Oxalidaceae]; UN-29	Kilmzi (T)	H	11 T:8	0.029	0.005	Pods & Lf	DIG-D	Toothache	The plant parts are roasted and applied on the affected area to alleviate the pain.	Buccal
		Tupit (R)		R:3			Lf	RES-R	Sinusitis	The leaves are dried and ground into a powder, which is then smoked to alleviate sinusitis.	Smoke
88.	<i>Paederia foetida</i> L. [Rubiaceae]; LD-107	Banamlu ai (R)	C	56 R:9	0.150	0.018	Lf	MUS-L	Bone fracture	The leaves are ground into a paste, which is then applied externally and secured with a bandage to stabilize and heal the fractured bone.	Topical
				R:10			Lf	SKIN-S	Contusion	The leaves are crushed into a paste and topically applied to lessen the contusion.	Topical
				R:4			Lf	SKIN-S	Cuts	The leaves are crushed into a paste and topically applied to stop bleeding and promote wound healing.	Topical
				R:12			Lf	DIG-D	Gastritis	The leaves are processed into a decoction, which is ingested or applied externally to relieve discomfort associated with gastritis.	Oral, topical
				R:4			Lf	DIG-D	Piles	The leaves are crushed to extract juice, then orally administered to treat piles.	Oral
				R:12			Lf	MUS-L	Sprain	The leaves are blanched, then made into a paste and applied topically to relieve a sprain.	Topical
				R:5			Lf	DIG-D	Stomachache	The young leaves are eaten raw to alleviate stomach pain.	Oral
89.	<i>Paris polyphylla</i> Sm. [Melanthiaceae]; LD-10	Ra-gu (R)	H	16 R:1	0.042	0.008	Rh	RES-R	Cough & cold	The rhizome is prepared as a decoction and ingested orally to relieve cough & cold.	Oral
				R:2			Rh	DIG-D	Diarrhoea	The rhizome is eaten raw to cure diarrhoea.	Oral

				R:13			Rh	DIG-D	Stomachache	The rhizome is eaten raw to relieve a stomachache.	Oral
90.	<i>Pavetta indica</i> L. [Rubiaceae]; LD-202	Khimtui khiangmei (R)	S	11 R:11	0.029	0.002	Lf	DIG-D	Jaundice	The leaves are stewed with prawn or made into a decoction and administered orally to treat jaundice.	Oral
91.	<i>Persicaria chinensis</i> (L.) H.Gross [Polygonaceae]; UN-22	Kilam (T)	S	34 T:12 T:22	0.091	0.005	Lf	MET-T	Diabetes	The leaves are prepared as a decoction and ingested orally to manage diabetes.	Oral
							Lf	MUS-L	Bone fractures	The leaves are crushed into a paste, then applied externally and secured with a bandage to stabilize and heal the fractured bone.	Topical
92.	<i>Persicaria posumbu</i> (Buch. -Ham. ex D.Don) H.Gross [Polygonaceae]; LD-163	Kokphai (R)	S	32 R:17	0.085	0.008	Lf	GEN-A	Chicken pox	Leaves are crushed to obtain juice, which is mixed with any animal bile and a drop of local wine, and administered orally to treat chicken pox.	Oral
				R:14			Lf	CAR-K	Hypertension	The leaves are crushed into juice and paste, then administered orally to regulate blood pressure.	Oral
				R:1			Lf	DIG-D	Toothache	The leaves are crushed to extract juice, which is then rinsed to relieve toothache.	Rinse
93.	* <i>Phlogacanthus thyrsiformis</i> (Roxb. ex Hardw.) Mabb. [Acanthaceae]; UN-12, LD-27	Chinglim (T) Khimtui (R)	S	149 T:21 R:3 R:105 R:7 R:5 R:8	0.399	0.016	Lf	RES-R	Cough & cold	The leaves are prepared as a decoction and ingested to cure cough & cold.	Oral
							Root	RES-R	Cough & cold	The root is prepared into a decoction and ingested orally to cure cough & cold.	Oral
							Lf	RES-R	Cough & cold	The leaves are prepared as a decoction with <i>Z. acanthopodium</i> leaves for oral use, and steam is inhaled to cure cough & cold.	Oral, inhale
							Lf	RES-R	Asthma	The leaves are prepared as a decoction and ingested orally to treat asthma and breathing difficulties.	Oral
							Lf	GEN-A	Fever	The leaves are prepared as a decoction with a little salt and administered orally to reduce fever.	Oral
							Lf	CAR-K	Hypertension	The leaves are consumed raw or cooked and administered orally to regulate hypertension.	Oral
94.	* <i>Phoebe lanceolata</i> (Nees) Nees [Lauraceae]; UN-42	Krumraibu (T)	T	12 T:12	0.032	0.002	Lf	MUS-L	Muscle ache	The leaves are prepared as a decoction and applied topically to alleviate muscleache.	Topical
95.	* <i>Phyllanthus emblica</i> L. [Phyllanthaceae]; LD-70	Talouthai (R)	T	26 R:6 R:1 R:3 R:1 R:3 R:3 R:3 R:2	0.069	0.026	Fr	RES-R	Asthma	The fruit is prepared as a decoction and ingested to improve breathing difficulties.	Oral
							Fr	SKIN-S	Burns	The leaves are crushed into a paste and applied topically to lessen skin burns.	Topical
							Fr	RES-R	Cough & cold	The fruit is prepared as a decoction and ingested to cure cough & cold.	Oral
							Fr	MET-T	Diabetes	The fruits are soaked in water, and then the infusion is administered orally to regulate blood sugar.	Oral
							Lf	MET-T	Diabetes	The leaves are prepared as a decoction and ingested to regulate blood sugar.	Oral
							Fr	EYE-F	Improves eyesight	The fruits are eaten raw, believed to improve eyesight	Oral
							Fr	DIG-D	Stomach detox	The fruits are crushed to extract juice and ingested to detoxify the stomach.	Oral
							Bark	DIG-D	Diarrhoea	The bark is prepared as a decoction and ingested to cure diarrhoea.	Oral

				R:2			Bark	DIG-D	Dysentery	The bark is prepared as a decoction, mixed with a little salt. The solution is ingested to cure dysentery.	Oral
				R:2			Bark	MUS-L	Unknown bodyache	The bark is boiled in water, then the steam is collected in a wet cloth for massage therapy to alleviate bodyache.	Massage
96.	<i>Physalis peruviana</i> L. [Solanaceae]; LD-160	Bubuakna (R)	S	11 R:11	0.029	0.002	Lf	SKIN-S	Boils	The seed is roasted and pounded into a paste, then applied topically to lessen boils.	Topical
97.	<i>Pinus kesiya</i> Royle ex Gordon [Pinaceae]; LD-236	Uchan	T	1 R:1	0.002	0.002	HW	NEU-N	Headache	The fresh heartwood is crushed into a paste and applied topically to the forehead to relieve headache.	Topical
98.	<i>Plantago asiatica</i> subsp. <i>erosa</i> (Wall.) Z. Yu Li [Plantaginaceae]; LD-04	Kaipat (R)	H	34 R:2 R:3	0.091	0.016	Lf	SKIN-S	Boils	The leaves are roasted and crushed into a paste and topically applied to lessen boils.	Topical
				R:7			Lf	DIG-D	Jaundice	The leaves are prepared as a decoction and ingested to treat jaundice.	Oral
				R:2			Lf	URO-U	Kidney Tonic	The leaves are prepared as a decoction and ingested to improve kidney health.	Oral
				R:13			Lf	EYE-F	Red eye	The leaves are crushed to extract juice, then applied as an eye drop to cure red eye.	Ophthalmic
				R:7			Lf	DIG-D	Stomachache	The leaves are prepared as a decoction or cooked as a vegetable, and administered orally to relieve stomachache.	Oral
							Lf	URO-U	UTI	The leaves are crushed to extract juice, which is then ingested to treat a urinary tract infection.	Oral
99.	<i>Pogostemon purpurascens</i> Dalzell [Lamiaceae]; LD-203	Chingkur ei (R)	H	23 R:9 R:2	0.061	0.013	Lf	DIG-D	Gastritis	The leaves are prepared as a decoction and applied topically to alleviate gastritis discomfort.	Topical
				R:5			Lf	NEU-N	Headache	The leaves are crushed to a paste and topically applied to the forehead to relieve a headache.	Topical
				R:5			Lf	SKIN-S	Improves hair	The leaves are prepared as a decoction and utilized for washing to improve hair growth.	Wash
				R:2			Lf	CAR-K	Heart Stroke	The leaves are crushed to extract juice, then ingested orally to improve heart activity.	Oral
							Lf	MUS-L	Unknown body ache	The leaves are prepared as a decoction and ingested to alleviate unknown bodyache.	Oral
100.	<i>Potentilla indica</i> (Andrews) Th. Wolf [Rosaceae]; LD-233	Laojeng tamuanna (R)	H	5 R:4 R:1	0.013	0.005	Lf	URO-U	Stone case	The leaves are prepared as a decoction mixed with rock sugar and ingested to treat renal and biliary calculi.	Oral
							Lf	FEM-X	White discharge	The leaves are prepared as a decoction mixed with rock sugar and ingested to treat white discharge.	Oral
101.	<i>Prasoxylon excelsum</i> (Spreng.) Mabb. [Meliaceae]; LD-59	Ganluak (R)	T	19 R:19	0.050	0.002	T Lf	CAR-K	Hypertension	The tender leaves are eaten as a cooked vegetable to regulate blood pressure.	Oral
102.	<i>Psidium guajava</i> L. [Myrtaceae]; LD-83	Matuann athai (R)	T	64 R:3 R:37	0.171	0.008	T Lf	MET-T	Diabetes	The leaves are prepared as a decoction and drunk to manage diabetes.	Oral
				R:24			T Lf	DIG-D	Diarrhoea	The leaves are prepared as a decoction and administered orally to stop diarrhoea.	Oral
							T Lf	DIG-D	Dysentery	The leaves are prepared as a decoction and administered orally to stop dysentery.	Oral
103.	<i>Quercus serrata</i> Murray [Fagaceae]; LD-120	Phaoh (R)	T	4 R:4	0.010	0.002	Root	SKIN-S	Bee sting	The fresh root is sliced, then topically applied to the stung area to alleviate pain and swelling.	Topical
104.	<i>Ranunculus sceleratus</i> L. [Ranunculaceae]; LD-200	Ra-Tingsaisu (R)	H	2 R:2	0.005	0.002	Lf & Fr	SKIN-S	Wart	The plant parts are crushed to a paste and applied topically to lessen the wart.	Topical

105.	<i>Ricinus communis</i> L. [Euphorbiaceae]; LD-198	Mouping (R)	S	8	0.021	0.005	Lf	MUS-L	Bodyache	The leaves are prepared as a decoction, and externally applied to relieve the bodyache.	Topical
				R:3 R:5			Lf	GEN-A	Fever	The leaves' decoction is topically applied over the body to reduce the fever.	Topical
106.	* <i>Rhus chinensis</i> Mill. [Anacardiaceae]; UN-4, LD-16	Khokmar a (T) Tamu (R)	T:	71	0.190	0.018	Fr	DIG-D	Gastritis	The fruits are prepared as a decoction and ingested to relieve gastritis discomfort.	Oral
				T:19 T:23			Fr	DIG-D	Indigestion	The fruits are prepared as a decoction mixed with a spoonful of honey and ingested to improve digestion.	Oral
				R:1			Fr	DIG-D	Indigestion	The fruits are soaked in water; the infusion, mixed with some salt, is administered orally to improve digestion.	Oral
				T:17 R:8			Fr	DIG-D	Dysentery	The fruits are consumed raw to treat dysentery.	oral
				R:1			Bark	DIG-D	Dysentery	The bark is prepared as a decoction and ingested to treat dysentery.	Oral
				R:2			Bark	SKIN-S	Hairfall control	The bark is prepared as a decoction, and wash with it to control hair fall.	Wash
							Fr	URO-U	Stone case	The dried fruits are soaked overnight; the infusion is administered orally to treat calculi.	Oral
107.	<i>Rhynchotechum ellipticum</i> (Wall. ex D.Dietr.) A.DC [Gesneriaceae]; LD-41	Gankaria k (R)	H	7	0.019	0.005	Lf	DIG-D	Constipation	The leaves are cooked as a vegetable. It is believed to prevent constipation.	Oral
				R:3 R:4			Lf	BLD-B	Blood purification	The leaves are cooked as a vegetable. It is also believed to purify blood and improve the immune system.	Oral
108.	<i>Rotheca serrata</i> (L.) Steane & Mabb. [Lamiaceae]; LD-194	Saraikat (R)	S	25	0.067	0.013	Lf	DIG-D	Gastritis	The leaves are prepared as a decoction and ingested to alleviate gastritis discomfort.	Oral
				R:2 R:4			Lf	DIG-D	Piles	The leaves are crushed to extract juice and ingested to treat piles bleeding and itching.	Oral
				R:7			T Lf	CAR-K	Hypertension	The tender leaves are cooked as a vegetable or consumed raw to regulate blood pressure.	Oral
				R:5			T Lf	CAR-K	Stroke	The plant part is crushed to extract juice and ingested to prevent cardiac arrest and stroke.	Oral
				R:7			T Lf	DIG-D	Stomachic	The tender leaves are consumed raw to relieve a stomachache.	Oral
109.	<i>Saccharum spontaneum</i> L. [Poaceae]; LD-132	Lhuang (R)	S	12	0.032	0.002	Stem	EYE-F	Cataract	The tender stem pith is crushed to extract juice, then applied as an eye drop to treat cataracts.	Ophthalmic
110.	<i>Salvia dianthera</i> Roth [Lamiaceae]; LD-82	Tamik (R)	H	47	0.126	0.010	Lf & Inf	DIG-D	Bloating	The plant parts are consumed raw with a few grains of rice to relieve bloating and associated discomfort.	Oral
				R:2 R:1			Lf & Inf	RES-R	Cough & cold	The plant parts are prepared as a decoction and ingested to relieve cough & cold.	Oral
				R:1			Lf & Inf	DIG-D	Diarrhoea	The plant parts are crushed to extract juice and mixed with a little sugar. The resulting solution is ingested to cure diarrhoea and regain energy.	Oral
				R:43			Lf & Inf	DIG-D	Gastritis	The plant parts are crushed to a paste and applied over the body to relieve gastritis discomfort.	Topical
111.	<i>Sapindus mukorossi</i> Gaertn. [Sapindaceae]; LD-33	Tazeithai (R)	T	41	0.109	0.016	Fr	DIG-D	Piles	The fruits are prepared as a decoction and used in a sitz bath to relieve pain and swelling of piles.	Sitz bath
				R:1 R:31			Fr	DIG-D	Intestinal worm	The fruits are soaked in water, and then the infusion is topically applied to the forehead to treat intestinal worms.	Topical
				R:2			Seed	DIG-D	Intestinal worm	The seeds are roasted and administered orally to expel intestinal worms.	Oral

				R:1			Fr	RES-R	Tonsillitis	The fruits are soaked in water; the infusion is mixed with a drop of phenol. The solution is gargled to treat tonsillitis.	Gargle
				R:4			Fr	DIG-D	Toothache	The fruits are crushed into a paste, then wrapped in a cotton cloth and applied in the infected area to relieve the pain.	Buccal
				R:2			Fr	SKIN-S	Improve hair growth	The fruits are soaked in water; the infusion is washed to improve hair growth.	Wash
112.	<i>#Sarcochlamys pulcherrima</i> (Roxb.) Gaudich. [Urticaceae]; LD-129	Guaibalei (R)	S	2 R:2	0.005	0.002	Lf	MET-T	Diabetes	The leaves are prepared as a decoction and ingested to manage diabetes.	Oral
113.	<i>#Solanum anguivi</i> Lam. [Solanaceae]; LD-183	Napkhuth ai (R)	S	41 R:1 R:35 R:5	0.109	0.008	Fr	DIG-D	Gastritis	The fruits are prepared as a decoction and ingested to alleviate gastritis.	Oral
							Fr	DIG-D	Tongue ulcer	The fruits are crushed to a paste, then applied on the tongue to treat an ulcer.	Translingual
							Fr	GEN-A	Typhoid fever	The fruits are crushed to extract juice, then mixed with honey. The solution is administered orally to reduce fever.	Oral
114.	<i>#Solanum nigrum</i> L. [Solanaceae]; LD-153	Ganthun (R)	H	8 R:4 R:4	0.021	0.005	Lf	SKIN-S	Boils	The leaves are crushed to a paste and topically applied to lessen boils.	Topical
							Lf	DIG-D	Stomachache	The leaves cooked as a vegetable are eaten to alleviate stomachache.	Oral
115.	<i>Solanum viarum</i> Dunal [Solanaceae]; LD-152	Pheisouth ai/saoh-thai (R)	S	9 R:6 R:3	0.024	0.005	Fr	DIG-D	Toothache	The fruits are either crushed to obtain juice or roasted and mixed with local salt. The resultant mixture is applied buccally to alleviate toothache.	Buccal
116.	<i>*Schima wallichii</i> (DC.) Korth. [Theaceae]; UN-13, LD-143	Markhing bu (T) Siang (R)	T	30 T:5 R:15 R:10	0.080	0.008	Seed	DIG-D	Toothache	The seeds are dried, powdered, and smoked to relieve toothache.	Smoke
							T Lf	DIG-D	Piles	The tender leaves are either consumed raw or cooked as a vegetable to treat piles and associated discomfort.	Oral
							T Lf	DIG-D	Dysentery	The tender leaves are either consumed raw or prepared as a decoction and ingested to treat dysentery.	Oral
							T Lf	DIG-D	Gastritis	The tender leaves are prepared as a decoction and administered orally to relieve gastritis.	Oral
117.	<i>Scoparia dulcis</i> L. [Plantaginaceae]; LD-173	Pungang (R)	H	8 R:4 R:4	0.021	0.005	Lf	SKIN-S	Cuts	The leaves are crushed to a paste and applied topically to stop bleeding and promote healing.	Topical
							Lf	URO-U	Stone case	The leaves are prepared as a decoction and administered orally to treat calculi in the urinary tract.	Oral
118.	<i>Spermacoce alata</i> Aubl. [Rubiaceae]; LD-242	Khangbaitek (R)	H	4 R:4	0.010	0.002	Lf	EYE-F	Cataract	The leaves are crushed to extract juice and applied as an eye drop to treat cataracts.	Ophthalmic
119.	<i>*Spondias pinnata</i> (L.f.) Kurz [Anacardiaceae]; UN-110, LD-12	Krunra (T) Tamzinth ai (R)	T	11 T:2 R:2 R:2 R:3	0.029	0.013	Lf & Fr	RES-R	Cough & Cold	The plant parts are prepared as a decoction and administered orally to relieve cough & cold.	Oral
							Bark	SKIN-S	Boils	The bark is subjected to boiling and then ground into a paste. The paste is applied externally to the affected area to reduce the presence of boils.	Topical
							Bark	DIG-D	Diarrhoea	The bark is prepared as a decoction and administered orally to treat diarrhoea.	Oral
							T Lf	MET-T	Diabetes	The tender leaves are prepared as a decoction and administered orally to manage diabetes.	Oral
							T Lf	URO-U	Stone case	The young leaves are processed into a decoction with rock sugar. The resultant solution is taken orally to address any calculi.	Oral
120.	<i>Stevia rebaudiana</i> (Bertoni) Bertoni [Asteraceae]; UN-21	Stevia (T)	H	11 T:6	0.029	0.008	WP	MET-T	Diabetes	The whole plant is processed into a decoction and administered orally to control diabetes.	Oral

				T:4			WP	DIG-D	Jaundice in newborns	The whole plant is processed into a decoction, from which a few drops are given orally to address jaundice in newborns.	Oral
				T:1			WP	DIG-D	Gastric	The whole plant is processed into a decoction and administered orally to control gastritis discomfort.	Oral
121.	<i>Syzygium cumini</i> (L.) Skeels [Myrtaceae]; LD-73	Kamuih deawna (R)	T	11	0.029	0.008	Bark	MET-T	Diabetes	The bark is prepared as a decoction and administered orally to control diabetes.	Oral
				R:2			Bark	DIG-D	Diarrhoea	The bark is prepared as a decoction and administered orally to treat diarrhoea.	Oral
				R:4			Bark	DIG-D	Dysentery	The bark is prepared as a decoction and administered orally to treat dysentery.	Oral
				R:5							
122.	<i>*Tamarindus indica</i> L. [Fabaceae]; UN-99, LD-244	Mongkira (T) Mangge (R)	T	8	0.021	0.008	Seed	SKIN-S	Ants & snake bites	The seed is crushed to a paste and topically applied to relieve itching and remove the venom.	Topical
				T:1			Seed	SKIN-S	Snakebite	The seed is crushed to a paste and topically applied to remove the venom.	Topical
				R:5							
				R:2			Fr	CAR-K	Hypertension	The fruits are prepared as a decoction and administered orally to control blood pressure.	Oral
123.	<i>Thysanolaena latifolia</i> (Roxb. ex Hornem.) Honda [Poaceae]; UN-51	Dungpil (T)	S	3	0.008	0.002	Lf	EYE-F	Eye problems	The leaves are crushed to extract juice, then applied as an eye drop to treat any eye problems.	Ophthalmic
124.	<i>Tithonia diversifolia</i> (Hemsl.) A.Gray [Asteraceae]; LD-221	Neihpuan g (R)	S	1	0.002	0.002	Lf	GEN-A	Hiccup	The leaves are prepared as a decoction and ingested to cure hiccups.	Oral
				R:1							
125.	<i>Toona ciliata</i> M.Roem. [Meliaceae]; LD-147	Theng (R)	T	25	0.067	0.010	Lf	SKIN-S	Cuts	The leaves are crushed into a paste and applied topically to stop bleeding and promote wound healing.	Topical
				R:1			Lf	GEN-A	Fever	The leaves are prepared as a decoction and ingested to reduce fever.	Bath
				R:4							
				R:13			Lf	DIG-D	Gastritis	The leaves are prepared as a decoction and applied topically over the whole body to alleviate gastritis.	Topical
				R:7			Lf	MUS-L	Unknown bodyache	The leaves are prepared as a decoction and applied topically over the whole body to alleviate body aches.	Topical
126.	<i>*Urena lobata</i> L. [Malvaceae]; UN- 88, LD-212	Ukana (T) Chakhhu ng (R)	S	6	0.016	0.008	Root	URO-U	Kidney Stone	The fresh root is prepared as a decoction and administered orally to treat renal calculi	Oral
				T:2			Lf	MET-T	Diabetes	The leaves are prepared as a decoction, then ingested to control diabetes.	Oral
				R:1			Lf	URO-U	Stone case	The leaves are prepared as a decoction, then ingested to treat any calculi.	Oral
127.	<i>Urtica dioica</i> L. [Urticaceae]; LD-116	Thunv (R)	H	7	0.018	0.005	Root	FEM-X	Cyst	The root is prepared as a decoction with rock sugar. The resultant solution is administered orally to lessen cyst formation in females.	Oral
				R:5			Root	RES-R	Cough	The root is prepared into a decoction and ingested orally to relieve a cough.	Oral
128.	<i>Verbena officinalis</i> L. [Verbenaceae]; LD-189	Duihpui (R)	H	4	0.010	0.005	WP	DIG-D	Piles	The whole plant decoction, lukewarm, is poured into a tub and sit to relieve pain	Sitz Bath
				R:2			WP	DIG-D	Intestinal worm	The whole plant is prepared into a decoction, then ingested to kill or expel intestinal worms.	Oral
129.	<i>Vitex negundo</i> L. [Lamiaceae]; LD-218	Uriksibi	S	15	0.040	0.010	Lf	SKIN-S	Skin allergy	The leaves are prepared into a decoction, then taken as a bath to soothe skin allergy and rash	Bath
				R:6							

				R:3			Lf	RES-R	Cough & cold	The leaves are prepared into a decoction, then ingested to relieve cough & cold.	Oral
				R:3			Lf	DIG-D	Piles	The leaves are crushed into a paste, then mixed with a few drops of kerosene and applied to the anus to treat piles.	Rectal application
				R:3			Lf	FEM-X	White discharge	The leaves' decoction is washed over the female genital area to manage white discharge.	Intimate wash
130.	<i>Xylosma longifolia</i> Clos [Salicaceae]; LD-146	Ruaisat (R)	T	16 R:16	0.042	0.002	Lf	DIG-D	Gastritis	The leaves' decoction is ingested to relieve gastritis discomfort, or boiled steam is collected on a wet cloth and massaged on the stomach to relieve gastritis.	Oral, massage
131.	[#] <i>Zanthoxylum acanthopodium</i> DC. [Rutaceae]; LD-28	Tangeng (R)	S	84 R:1 R:1 R:75 R:1 R:5 R:1	0.225	0.016	Lf	SKIN-S	Skin allergy	The fresh leaves crushed paste is applied to the rash area to soothe the skin allergy	Topical
							Lf	RES-R	Asthma	The prepared decoction is ingested to help with asthma and other breathing difficulties	Oral
							Lf	RES-R	Cough & cold	The leaves are boiled together with <i>Phlogacanthus thrysiformis</i> leaves (1:2 ratio), then the decoction is ingested orally to relieve cough & cold. Boiled steam is also inhaled for the same.	Oral, inhale
							Fr	RES-R	Cough & cold	The fresh fruit decoction is taken to relieve cough & cold	Oral
							Lf	GEN-A	Fever	The fresh leaves decoction is mixed with a pinch of salt and ingested orally to alleviate fever.	Oral
							Fr	DIG-D	Toothache	The fresh fruit crushed paste is chewed to relieve a toothache.	Oral

400

401 **Notes:** R= Rongmei, T= Tangkhul, Fr= fruit, Lf= leaf, HW=heart wood, Inf= inflorescence, Rh=rhizome, T Lf=tender leaf, WP=whole plant. * indicates taxa commonly used
402 by the two tribes, [#] indicates taxa with medicinal and edible uses.

403

Plant parts use, crude drug preparation, and administration

The study documented ten plant parts (8 aboveground and 2 underground) used to address 83 diseases across 14 ailment categories, indicating the richness, versatility, and continued importance of indigenous ethnomedicinal knowledge in the study areas. Among these, leaves were the most frequently cited parts for medicine preparation, accounting for 69.96%, followed by rhizomes at 12.95%, while seeds were the least cited, contributing only 0.32% to the overall use of plant parts as remedies. Figure 5 illustrates the distribution of various plant parts employed in treating different categories of ailments in the two study areas.

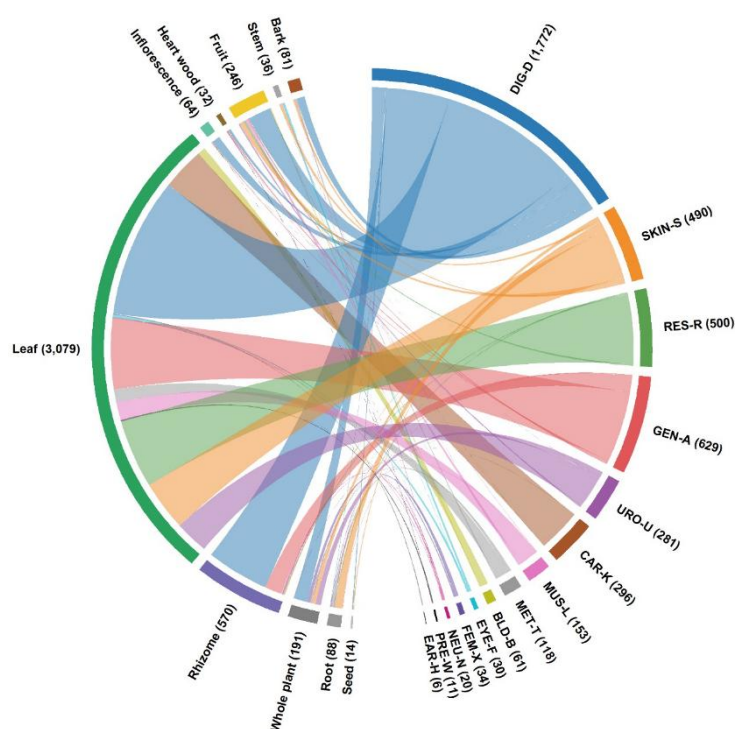


Figure 5. Plant parts used in the treatment of different ailment categories; the left half shows plant parts, and the right half shows ailment categories with UR.

Based on the ethnomedicinal inventory of 131 plant species, the study identifies a diverse range of traditional processing techniques used to extract therapeutic properties from various plant parts. The utilization of various plant parts is categorised into 19 distinct methods of drug preparation. Among the various forms of preparation, decoction is the most

prevalent method with a total of 1489 UR, where a substantial number of remedies are prepared by boiling plant parts like leaves, whole plant, bark, fruit, heartwood, etc., in water to create a concentrated extract (e.g., *Centella asiatica*, *Phlogacanthus thyrsiformis*). Crushed paste with 819 UR is the next commonly used method, where fresh plant parts (primarily leaves like *Ageratina adenophora* or *Mikania micrantha*) are crushed into paste and applied as a raw paste, followed by raw/fresh (452 UR), where direct consumption or application of the plant part without processing (Figure 6).

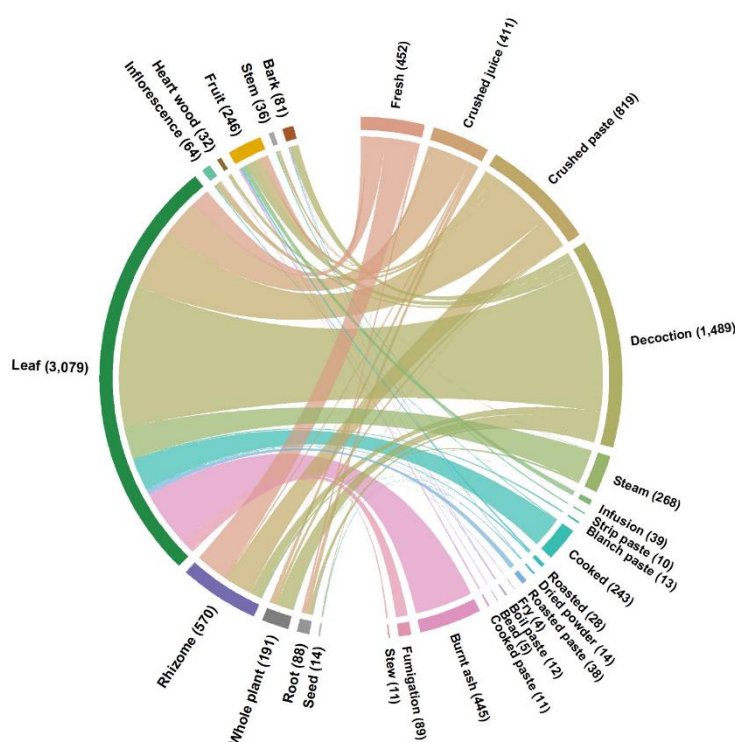


Figure 6. Plant parts used and modes of preparation, weighted by UR; the left half shows plant parts, and the right half shows modes of preparation.

Routes of Administration

The administration of these herbal drugs is broadly categorized into internal and external routes. Internal routes of administration include oral, translingual, snuff, smoke, rectal application, nasal drop, inhale, gargle, eye drop, ear drop, chew, and buccal, while external routes include wear, wash, topical application, sitz bath, and bath, making a total of 18 routes

of administration. The informants' reports show that most of the herbal remedies are administered orally (2679 UR), followed by topical application (1157 UR), and inhalation (274 UR) (Figure 7).

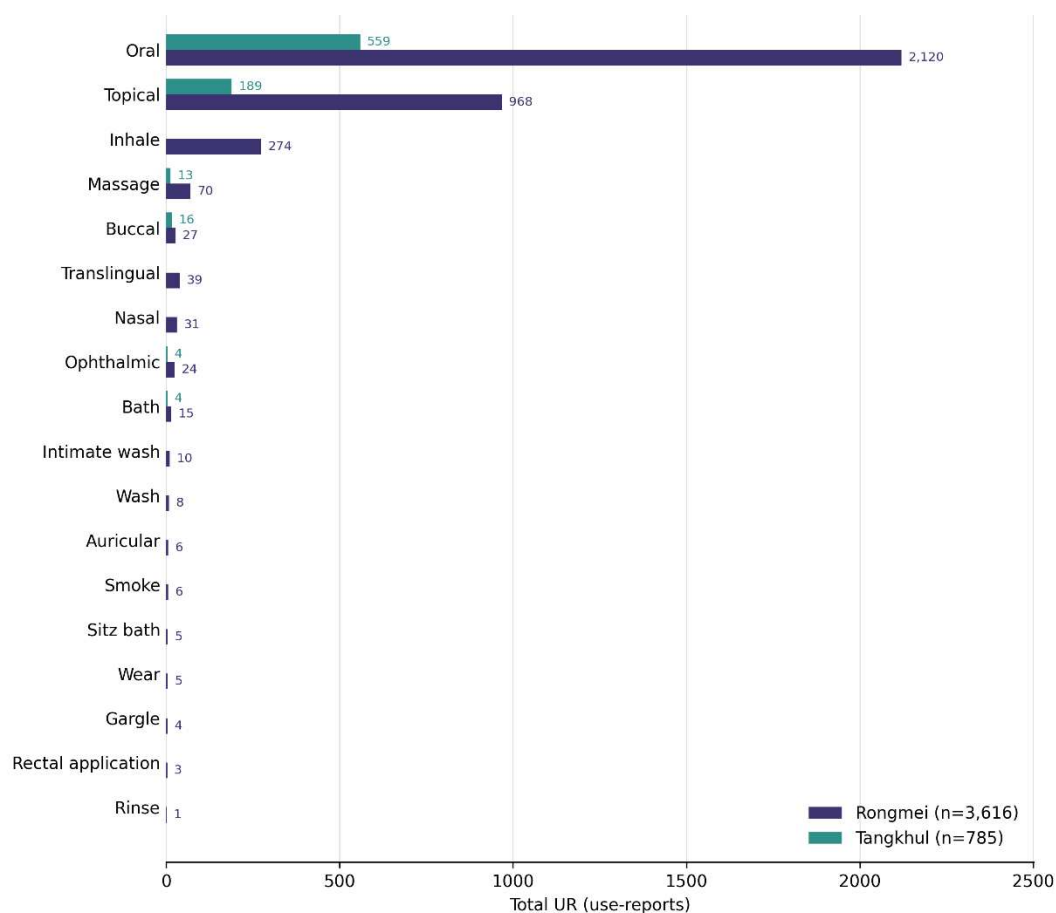


Figure 7. Route of administration of medicinal plant preparations

Quantitative analysis and pharmacological relevance

RFC values across the 131 reported medicinal taxa ranged from 0.002 to 0.544 (mean RFC = 0.057), with 14 species receiving at least 54 UR each. The top five species with high RFC values are *Brassaiopsis glomerulata* (0.544), followed by *Phlogacanthus thyrsoformis* (0.399), *Mikania micrantha* (0.284), *Goniothalamus sesquipedalis* (0.278), and *Zanthoxylum acanthopodium* (0.225), which indicates that these species are most consistently cited across informants and are the strongest candidates for further ethnopharmacological attention on a

frequency-of-citation basis. On the other hand, the lowest RFC value of 0.002 was obtained for 8 species, viz., *Alpinia nigra*, *Blumea flava*, *Butea buteiformis*, *Gnetum gnemon*, *Homonoia riparia*, *Lobelia nummularia*, *Pinus kesiya*, and *Tithonia diversifolia*, reflecting citation by a single informant and warranting cautious interpretation given the limited evidentiary base (Table 3).

UV provides the overall importance or versatility of a plant based on the number of reported uses. Among the species, *Phyllanthus emblica* has the highest UV (0.026), which is used for treating nine different ailments, viz., asthma, burns, cough & cold, diabetes, improves eyesight, stomach detox, diarrhoea, dysentery, unknown bodyache, followed by *Centella asiatica* and *Musa balbisiana* with the UV of 0.024 each (Table 3). High UV in these taxa reflects broad-spectrum reported use rather than efficacy for any single medicinal use. It should be interpreted alongside Fidelity Level (below) to distinguish generalist from specialist therapeutic taxa.

ICF values, which quantify informant agreement on plant selection within a given ailment category, ranged from 0.68 (NEU-N) to 1.00 (EAR-H), with CAR-K and BLD-B each returning 0.97. The majority of ailment categories exceeded ICF 0.7, indicating comparatively high consensus in taxon selection for common ailments across the Rongmei and Tangkhul informant pools. In contrast, Neurological (NEU-N) exhibits a lower ICF value of 0.68. This low ICF value suggests fewer informants and minimal shared knowledge for the specific ailment category. The Digestive disorder category (DIG-D) had the highest species richness (81 species), with gastritis alone accounting for 33 species — indicating both the high prevalence of gastric ailments in these communities and a correspondingly wide, non-consensual pool of remedies. The ICF value for each ailment category, the number of species utilized, and the UR for each disease are presented in Table 4.

491 Table 4. Informant Consensus Factor for various ailment categories

Sl.no	ICPC-2 Ailment Category	Disease	NuR	Nt	ICF
			Tribe:		
1.	Blood, Blood Forming Organs and Immune Mechanism (BLD-B)	Improves blood circulation	61 R: 61	3	0.97
2.	Cardiovascular (CAR-K)	Stroke, Hypertension	296 R: 197, T: 99	11	0.97
3.	Digestive (DIG-D)	Bowel movement, bloating, constipation, diarrhoea, dysentery, gas problems, gastritis, indigestion, intestinal worm, jaundice, liver tonic, piles, stomach detox, stomach ulcer, stomachache. tongue ulcer, toothache, typhoid	1772 R: 1570, T: 202	81	0.97
4.	Ear (EAR-H)	Earache	6 R: 6	1	1
5.	Eye (EYE-F)	Cataract, eye injury, eye problems, improves eyesight, red eye	30 R: 26, T: 4	9	0.72
6.	Female Genital (FEM-X)	Cyst, White discharge, Menstrual cramp	34 R: 34	9	0.76
7.	General and Unspecified (GEN-A)	Evil spirit, chickenpox, Fever, Hiccup, Malaria, Typhoid fever, Unknown swelling	629 R: 606. T: 23	20	0.97
8.	Endocrine/Metabolic and Nutritional (MET-T)	Cholesterol, diabetes	118 R: 46 T:72	17	0.86
9.	Musculoskeletal (MUS-L)	Bodyache, Bone fracture, Musclease, Sprain, Unknown bodyache	153 R: 67, T:86	16	0.90
10.	Neurological (NEU-N)	Brain tonic, Headache, Numbness & Tingling sensation, Seizure	20 R: 17. T: 3	7	0.68
11.	Pregnancy, Childbearing, Family Planning (PRE-W)	Difficulty in delivery, Lactation	11 R: 11	3	0.70
12.	Respiratory (RES-R)	Asthma, Breathing Problem, Cough, Cough & cold, Nose bleeding, Sinusitis, Tonsillitis.	500 R:446, T: 54	21	0.966
13.	Skin (SKIN-S)	Ant bites, Bee sting, Boils, Burns, Contusion, Cut & wound, Cuts, Hairfall control, Improve hair growth, Skin Infection, Mosquito bite, Ringworm, Septic wounds, Skin allergy, Skin irritation, Skin moisturizer, Snake bite, Wart	490 R: 392, T: 98	47	0.90
14.	Urological (URO-U)	Kidney problems, Kidney Stone, Kidney tonic, Stone case, Urinary problem, Urinary tract infection	281 R: 137, T: 144	21	0.93

(Notes: NuR= No. of Use Reports, Nt= Total no. of Taxa Reported, R= Rongmei; T= Tangkhul, ICF= Informant consensus factor)

FL tabulated for 18 taxa with >40 UR ranged from 33.80% to 96.67% (Table 5). Following the conventional threshold of FL $\geq$ 80% as indicative of strong single-indication consensus [51], nine of the 19 taxa met this criterion: *Clerodendrum colebrookeanum* (96.67%, hypertension), *Mikania micrantha* (92.45%, cuts and wounds), *Salvia dianthera* (91.49%, gastritis), *Zanthoxylum acanthopodium* (90.48%, cough and cold), *Phlogacanthus thyrsiformis* (86.58%, cough and cold), *Goniiothalamus sesquipedalis* (85.58%, fever and gastritis), *Solanum anguivi* (85.37%, tongue ulcers), *Chromolaena odorata* (81.48%, cuts), and *Sapindus mukorossi* (80.49%, intestinal worm infestation). These taxa represent the strongest candidates for targeted pharmacological validation, since high FL indicates a narrow, reproducible therapeutic signal rather than diffuse multi-purpose use. Conversely, species such as *Brassaiopsis glomerulata* (42.86%) and *Centella asiatica* (35.62%) combine high RFC with low FL, indicating that although these species are well known, their reported use spans multiple unrelated indications. Notably, 7 of the 19 high-UR taxa (*Salvia dianthera*, *Heptapleurum ellipticum*, *Artemisia keiskeana*, *Paederia foetida*, *Brassaiopsis glomerulata*, *Cissus adnata*, and *Rhus chinensis*) currently lack any documented pharmacological literature despite high citation volume and FL. Therefore, this represents a clear and quantifiable evidence gap for future phytochemical investigation.

Table 5. Fidelity Level of species with > 40 UR

Sl.no.	Botanical name (Disease treated)	N	Np	FL %	Pharmacological relevance	Rank
1.	<i>Clerodendrum colebrookeanum</i> (Hypertension)	60	58	96.67	Antihypertensive [56,57], Prevention of metabolic syndrome [58].	1 st
2.	<i>Mikania micrantha</i> (cuts and wounds)	106	98	92.45	Cutaneous wound healing activity [59]	2 nd
3.	<i>Salvia dianthera</i> (Gastritis)	47	43	91.49	No relevant work	3 rd
4.	<i>Zanthoxylum acanthopodium</i> (cough and cold)	84	76	90.48	No relevant work	4 th
5.	<i>Phlogacanthus thyrsiformis</i> (cough and cold)	149	129	86.58	Analgesic, anti-inflammatory, and antioxidant activities [60]	5 th
6.	<i>Goniiothalamus sesquipedalis</i> (Fever & gastritis & evil spirit)	104	89	85.58	Antibacterial [61]	6 th

7.	<i>Solanum anguivi</i> (tongue ulcer)	41	35	85.37	Antioxidant and antibacterial activities [62]	7 th
8.	<i>Chromolaena odorata</i> (Cuts)	54	44	81.48	Wound healing [63]; Antibacterial activity [64,65]	8 th
9.	<i>Sapindus mukorossi</i> (Intestinal worm)	41	33	80.49	Antibacterial, Antimicrobial and insecticidal activities [66,67]	9 th
10.	<i>Crassocephalum crepidioides</i> (Gastritis and cuts)	66	50	75.76	Antibiogram and antibacterial activity [68]	10 th
11.	<i>Ageratina adenophora</i> (Dysentery)	42	31	73.81	Antibacterial activity [69]	11 th
12.	<i>Heptapleurum ellipticum</i> (Gastritis)	66	44	66.67	No relevant work	12 th
13.	<i>Artemisia keiskeana</i> (Cuts)	49	29	59.18	No relevant work	13 th
14.	<i>Psidium guajava</i> (Diarrhoea)	64	37	57.81	Antimicrobial activities [70,71]	14 th
15.	<i>Paederia foetida</i> (Bone fractures)	56	31	55.36	No relevant work	15 th
16.	<i>Brassaiopsis glomerulata</i> (Kidney problems)	203	87	42.86	No relevant work	16 th
17.	<i>Cissus adnata</i> (Cuts)	67	25	37.31	No relevant work	17 th
18.	<i>Centella asiatica</i> (Stomach ulcer)	73	26	35.62	Anti-ulcer Potential [72], Anti-bacterial, Anti-inflammatory activities [73]	18 th
19.	<i>Rhus chinensis</i> (Indigestion)	71	24	33.80	No relevant work	19 th

513

514 ***Cross-cultural ethnopharmacology of the medicinal taxa common to the communities***

515 Of the 131 taxa recorded across the two study areas, only 21 species were common to both
516 the Rongmei (Churachandpur) and Tangkhul (Kamjong) informant groups, yielding a JI value
517 of 16.03%, indicating low species overlap (Figure 8). This low similarity indicates marked
518 differences in medicinal plant composition between the Rongmei (Churachandpur) and
519 Tangkhul (Kamjong) communities, with 116 taxa recorded in Churachandpur, 36 in
520 Kamjong, and 21 common to both. The calculated RSI is 9.16%, reflecting modest similarity
521 between the two communities (Figure 8)

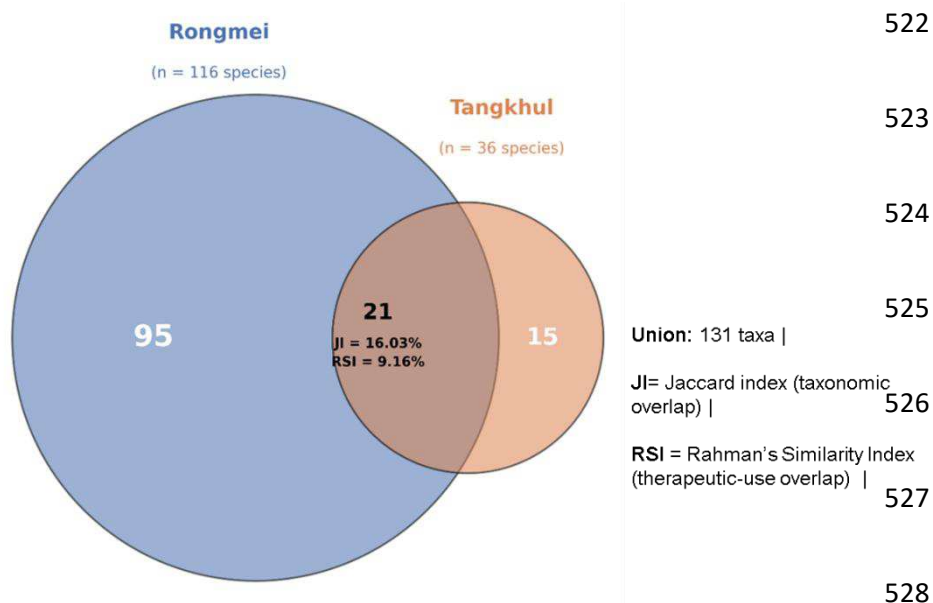


Figure 8. Venn diagram showing the number of species used by Rongmei and Tangkhul, and the JI and RSI%.

To assess whether floristic overlap corresponded to shared therapeutic knowledge, the recorded UR for each of these 21 taxa was compared at two levels: (i) the specific ailment treated, and (ii) the broader ICPC ailment category to which that ailment belongs (Table 6). This comparison showed that 11 of the 21 shared taxa (52.4%) were used to treat the identical specific ailment in both communities: *Brassaiopsis glomerulata* (kidney problems/tonic; URO-U), *Clerodendrum colebrookeanum* (hypertension; CAR-K), *Crassocephalum crepidioides* (gastritis; DIG-D), *Eurya acuminata* (diabetes; MET-T), *Mimosa pudica* (kidney stones/stone case; URO-U), *Musa balbisiana* (malaria; GEN-A), *Oxalis corniculata* (toothache; DIG-D), *Phlogacanthus thyrsiformis* (cough and cold; RES-R), *Rhus chinensis* (indigestion and dysentery; DIG-D), *Tamarindus indica* (snake/insect bites; SKIN-S), and *Urena lobata* (kidney stone/stone case; URO-U). This value (d = 11) was used as the numerator for the RSI calculation (RSI = 9.16%). Among these, *Phlogacanthus thyrsiformis* recorded the highest combined UR count for a single convergent ailment (234 UR: 21 UR in Tangkhul, 213 UR in Rongmei, for cough/cough-and-cold), followed by *Brassaiopsis*

glomerulata (kidney-related uses, 174 UR total) and *Rhus chinensis*, which independently converged on both indigestion and dysentery in the two communities. A further 7 shared taxa (33.3%) — *Centella asiatica*, *Cissus adnata*, *Garcinia pedunculata*, *Hellenia speciosa*, *Heptapleurum ellipticum*, *Oroxylum indicum*, and *Schima wallichii* — were applied within the same broad ICPC category by both tribes (e.g., digestive, skin, or musculoskeletal disorders) but for a different specific ailment within that category. For instance, *Cissus adnata* was used for cuts and septic wounds (SKIN-S) among the Tangkhul, but for skin allergy and boils (SKIN-S) among the Rongmei, while *Heptapleurum ellipticum* was applied for evil spirits (GEN-A) in Tangkhul practice versus fever and breathing problems (GEN-A) in Rongmei practice. This category-level, sub-ailment-divergent group represents a therapeutic domain that is culturally conserved even where the precise clinical application is not. The remaining 3 shared taxa (14.3%) — *Elsholtzia blanda*, *Erythrina variegata*, and *Spondias pinnata* — showed no overlap at either the ailment or category level, being applied to entirely unrelated conditions in each community (e.g., *Erythrina variegata* was used for headache, NEU-N, among the Tangkhul, but for boils, evil spirits, gastritis, and fever, spanning SKIN-S, GEN-A, and DIG-D, among the Rongmei).

Table 6. Concordance of therapeutic applications among the 21 medicinal taxa common to the Rongmei and Tangkhul Naga communities

<i>Concordance level</i>	<i>No. of species</i>	<i>% of shared</i>	<i>Representative species</i>
Same specific ailment	11	52.4	<i>Brassaiopsis glomerulata</i> , <i>Clerodendrum colebrookeanum</i> , <i>Crassocephalum crepidioides</i> , <i>Eurya acuminata</i> , <i>Mimosa pudica</i> , <i>Musa balbisiana</i> , <i>Oxalis corniculata</i> , <i>Phlogacanthus thyrsoformis</i> , <i>Rhus chinensis</i> , <i>Tamarindus indica</i> , and <i>Urena lobata</i>
Same ICPC category, different ailment	7	33.3	<i>Centella asiatica</i> , <i>Cissus adnata</i> , <i>Garcinia pedunculata</i> , <i>Hellenia speciosa</i> , <i>Heptapleurum ellipticum</i> , <i>Oroxylum indicum</i> , and <i>Schima wallichii</i>
No overlap (different category)	3	14.3	<i>Elsholtzia blanda</i> , <i>Erythrina variegata</i> , <i>Spondias pinnata</i>
Total shared taxa	21		-

566 Overall, these results indicate that floristic co-occurrence between the two communities is
567 only a partial predictor of shared ethnomedicinal application: while over half of the
568 commonly used species converge on an identical therapeutic indication, nearly one in seven
569 shared species is put to a wholly unrelated use, underscoring that medicinal plant knowledge
570 in the study area is shaped by community-specific factors independent of plant availability
571 alone.

572 The comparison of plant-part UR between the two communities (Figure 9) showed
573 leaves as the dominant plant part cited by both tribes, at closely comparable proportions
574 (Tangkhul: 569/785, 72.5%; Rongmei: 2510/3616, 69.4%), with no significant difference
575 between tribes ($p > 0.05$). Whole plant, bark, stem, and seed use likewise did not differ
576 significantly between the tribes ($p = 1.00$, $p = 1$, $p = 0.14$, and $p = 1$, respectively).

577 In contrast, five of the ten plant-part categories diverged significantly between tribes,
578 surviving Bonferroni correction for multiple comparisons ($\alpha = 0.0050$). Root use was
579 proportionally far higher among the Tangkhul (8.02% vs. 0.69%, $p < 0.001$) as was fruit use
580 (12.10% vs. 4.18%, $p < 0.001$). Conversely, rhizome use was proportionally much higher
581 among the Rongmei (15.74% vs. 0.13%, $p < 0.001$), as were inflorescence (1.6% vs. 0.38%,
582 $p < 0.001$), and heartwood (0.88% vs. 0%, $p = 0.039$).

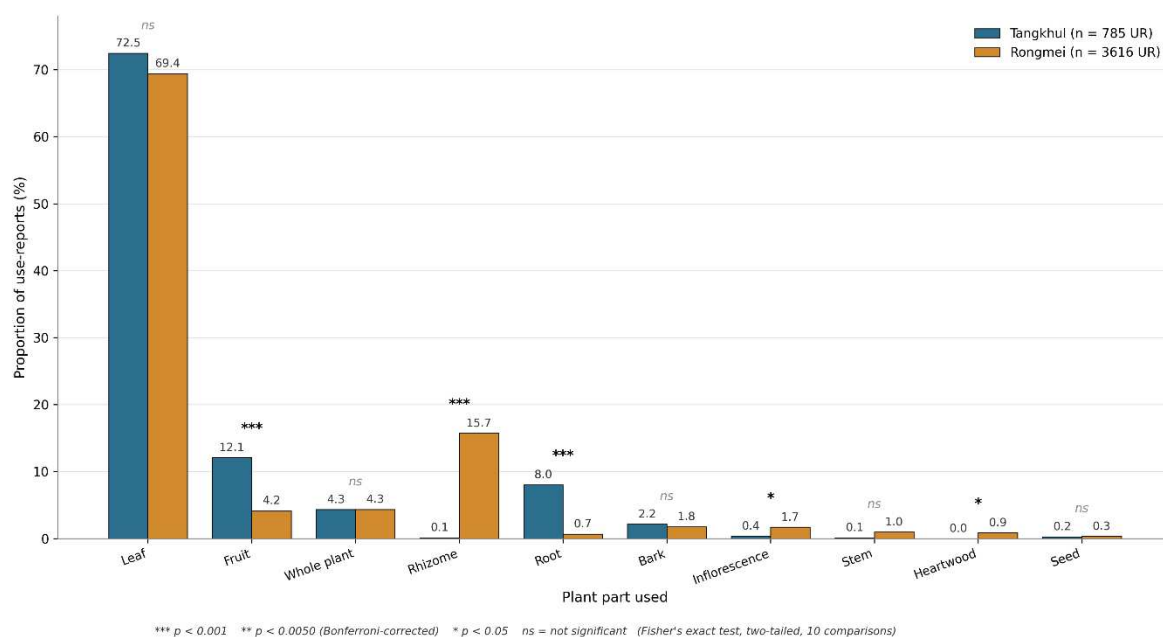


Figure 9: Proportion of medicinal plant parts used among the two Naga tribes depicted based on the UR, applying Fisher's exact test with Bonferroni correction ($\alpha=0.005$), for each plant part.

Discussion

Influence of demographic variables on plant-use knowledge

None of the three socio-demographic variables examined showed a significant association with medicinal plant knowledge in either community. This probably reflects a knowledge base that's genuinely shared across the community rather than concentrated in any particular group — which fits with the fact that our informants were general community members, not specialized healers. A few older informants also seemed to struggle to recall plants they rarely used, and age and education may have been tangled together in ways that muddled any real signal. The null gender and education associations align with studies conducted elsewhere in India and abroad [74–76]. Such disparities, where they occur, may reflect specific cultural contexts rather than a general property of ethnomedicinal knowledge systems. By contrast, Bhat et al. [77] reported a significant association between education level and medicinal plant

600 knowledge in the Kashmir region of India, which they attributed in part to migration:
 601 formally educated individuals often move to urban areas for schooling or employment, a
 602 mechanism they propose drives knowledge erosion among that group specifically. Our study
 603 partially supports this mechanism: Master's-level informants reported the lowest mean
 604 citation count among the Tangkhul (1.77 ± 0.93 , $n = 13$), compared to Primary (2.90 ± 1.70),
 605 Graduate (2.85 ± 2.40), and Secondary level (2.75 ± 1.67). This pattern was not observed
 606 among the Rongmei, however, where Master's-level informants (10.78 ± 7.92 , $n = 9$) reported
 607 the second-highest average citation count after those with only primary education ($11.11 \pm$
 608 5.82) — a discrepancy that may itself reflect the very different scales of ethnomedicinal
 609 knowledge documented in each community: the Tangkhul pharmacopoeia recorded here
 610 comprises only 36 species, compared to 116 among the Rongmei, which necessarily
 611 constrains the ceiling on individual citation counts regardless of education level.

612 Age class followed the same null pattern in both groups. Several factors may account for this.
 613 First, in our own fieldwork we encountered some older informants (above 75 years) who
 614 could not recall certain plants, apparently due to advanced age combined with infrequent use
 615 of those species. This pattern is consistent with recall bias selectively depressing reported
 616 knowledge at the oldest end of the age range. It does not necessarily reflect an underlying
 617 lack of knowledge, and broadly matches the curvilinear age pattern — knowledge rising, then
 618 declining among the oldest informants — reported by Tamene et al.[75]. Second, the oldest
 619 age classes typically have smaller sample sizes, which reduces statistical power to detect true
 620 differences at the extremes. Third, the wider literature is genuinely divided on this variable,
 621 and the division appears to track methodology as much as biology. Studies conducted in the
 622 Tripura and Kashmir regions of India detected a significant age effect on ethnomedicinal
 623 knowledge using a categorical chi-square test [74] [77]. Although earlier reports suggest that
 624 ethnomedicinal knowledge is concentrated among older individuals [2], we found no

significant association between age and plant-use knowledge in either community, which may reflect the recall and sampling factors discussed above. Purposive selection of informants for knowledge and willingness to participate, and pooling of villages, will have reduced variance and may bias tests toward the null. A mixed-effects count model with village as a random effect and age, gender, and education entered jointly would be a more appropriate test.

Taken together, our findings suggest that socio-demographic variables do not consistently predict ethnomedicinal knowledge, and that local cultural context and methodological choices may explain much of the variation reported across studies.

Taxonomic diversity of the reported medicinal taxa and comparative regional analysis

The documentation of 131 taxa across 57 families and 117 genera represents a substantially higher level of recorded medicinal plant diversity than in other studies in the region. For instance, earlier ethnomedicinal surveys among the Tangkhul tribe have reported varying counts, such as 37 to 57 species of medicinal plants in the Ukhrul district [18,78]. Similarly, studies among the Rongmei tribe in the Tamenglong district documented 60 species belonging to 36 families [79]. The higher species count in the present study is attributed to the broader geographical scope (covering both Churachandpur and Kamjong districts) and the inclusion of both forest and home-garden sources. The findings correspond more closely with large-scale surveys such as those in the sacred groves of Manipur, which recorded 120 plant species across 57 families [17]. The similarity in the number of families between the current study and the sacred grove survey suggests a saturation point for medicinal plant family diversity within specific ecological zones of Manipur [17]. Among the angiosperm families, the dominance of Asteraceae is a recurring theme in Manipuri ethnobotany, corroborated by studies of the Mao Naga community [80], the Scheduled Caste community of Khurkhul [81], and the Zeliangrong ethnic group [2]. This dominance is often attributed to the family's

cosmopolitan distribution and the presence of diverse bioactive substances, which contribute to its medicinal uses across its constituent genera [82]. The Zingiberaceae and Lamiaceae also feature prominently as dominant families, which is consistent with the traditional use of common spices as medicines in Manipur. Studies on spice utilization in the region indicate that Lamiaceae and Zingiberaceae often contribute the highest number of species to the local pharmacopeia due to their high essential oil content and aromatic properties [35,83]. The prevalence of *Curcuma* and *Alpinia* (Zingiberaceae) as dominant genera in the current study is mirrored in findings from the Tamenglong district, where 34 economically important Zingiberaceous species were identified for their therapeutic use [30].

The dominance of herbaceous life forms is a recurring pattern in ethnomedicinal studies in Northeast India [2,84,85]. The high proportion of herbs and shrubs is often explained by their accessibility and the ease with which their primary medicinal parts (leaves, rhizomes, and whole plants) can be harvested and prepared, showing consistency with the accessibility hypothesis. The current study's herb dominance indicates that the Rongmei and Tangkhul Naga tribes in Churachandpur and Kamjong primarily utilize the understory and disturbed forest areas, as well as anthropogenic landscapes like home gardens, where herbaceous diversity is typically higher.

Plant parts used, crude drug preparation, and administration

Leaves were the dominant plant part in both communities, and their proportions did not differ significantly between the Rongmei and Tangkhul (Fig. 9). In Manipur, as well as in other northeastern states of India, research supports this observation, indicating that leaves are predominantly employed in ethnomedicine [2,80,86,87]. This pattern is also aligned with ethnomedicinal plant studies conducted in other countries like Nigeria, Morocco, and Indonesia [9,88,89]. The preference for leaves is often attributed to their abundance, ease of

collection, and the fact that harvesting leaves is less destructive to the plant compared to harvesting roots or bark, thereby maintaining the sustainability of the medicinal resources [2,9].

Decoctions are mostly prescribed for gastrointestinal and urological disorders. The prevalence of decoction for crude drug preparation techniques in ethnomedicine is also reported in northeastern India and other parts of the world [9,84,88,89]. The widespread use of decoction is linked to its effectiveness in extracting active phytochemicals through heat [88,90]. One of the distinct methods identified in the current study among the Rongmei community is the use of burnt ash. This involves burning the leaves of *Goniothalamus sesquipedalis* and mixing the resulting residue with water to help alleviate gastritis, fever, and ward off evil spirits. To our knowledge, there are no such medicinal reports in India.

As noted above, oral administration is the dominant route of herbal-remedy administration in this study. Oral administration is generally preferred for gastrointestinal issues such as gastritis, jaundice, dysentery, diarrhoea, intestinal worms, and urological conditions like kidney stones and urinary problems. This pattern indicates wider regional practices across northeast India, where oral consumption is primarily preferred for gastrointestinal disorders [17,87]. Studies abroad in India also show similar trends, with oral administration comprising 73% in Morocco [89], 65% in Bangladesh [91], and 65% in Indonesia [9] for internal and other gastrointestinal ailments. In contrast, topical applications are primarily used for skin conditions, injuries, and localized pain. The steam or vapor method, which utilizes heat and moisture, is often employed for massage, topical relief (e.g., *Curcuma* spp.), and respiratory treatments (e.g., *Equisetum ramosissimum*, *Cynodon dactylon*, *Phlogacanthus thyrsiformis*) is a distinctive therapy among the Naga tribes. Nevertheless, there are limited reports from other ethnic groups in Northeast India utilizing different plant species [92–96].

698 ***Additives in Ethnomedicine: Honey, Salt, Rock Sugar, and Animal Parts***

699 The incorporation of non-plant additives like rock sugar, honey, salt, animal bile, and
700 excrement represents a complex element of traditional medicine, fulfilling various functions
701 from enhancing flavour to promoting therapeutic synergy. This suggests that medicinal
702 knowledge is not only botanical but embedded in local therapeutic traditions. It should be
703 noted that these additive functions are as reported by informants and reflect folk
704 pharmacological reasoning. None of the claimed synergistic effects have been experimentally
705 validated in this study, and we present them descriptively rather than as confirmed
706 pharmacological interactions. Rock sugar (locally *mishri* or *sidamchi*) was the most
707 frequently reported additive, used with 19 species across 82 use reports, predominantly for
708 urological disorders (stone cases, urinary complaints), female genital problems, diabetes, and
709 gastrointestinal conditions such as jaundice and diarrhoea. This is consistent with reports
710 from other Manipur communities, where rock sugar is combined with *Mimosa pudica* root
711 decoction for diabetes management among the Liangmai and Meetei [97,98], and with a
712 comparable practice in Tripura, where sugar is added to *Averrhoa carambola* juice for
713 jaundice [99].

714 Honey was recorded with 10 species (*Centella asiatica*, *Cinnamomum verum*,
715 *Curcuma zanthorrhiza*, *Cynodon dactylon*, *Elsholtzia blanda*, *Mikania micrantha*, *Mimosa*
716 *pudica*, *Musa balbisiana*, *Rhus chinensis*, and *Solanum anguivi*), accounting for 77 use
717 reports, mainly for gastrointestinal ailments. This pattern is corroborated by other Manipur-
718 based studies reporting honey combined with *Acorus calamus* rhizome for cough alleviation
719 among the Liangmai [98]. Other ethnomedicinal studies in the state observed that honey is
720 also blended with plant extracts to treat coughs, fevers, and stomach ulcers [97,100].
721 Additionally, honey serves as a preservative in intricate formulations, as demonstrated in the
722 Chakma community of Tripura [5]. Honey's reported roles here — as a vehicle, sweetener,

and preservative — are plausible given its known antimicrobial and hygroscopic properties [101,102], though this study did not test whether these properties are functionally relevant to the specific formulations recorded.

In this study, salt was reported with 11 species- *Cinnamomum verum*, *Entada rheedei*, *Eryngium foetidum*, *Erythrina stricta*, *Eupatorium cannabinum*, *Heptapleurum ellipticum*, *Phlogacanthus thyrsoformis*, *Phyllanthus emblica*, *Rhus chinensis*, *Solanum viarum*, and *Zanthoxylum acanthopodium*, totalling 50 UR, primarily for fever, toothache, body aches, and indigestion. Our report corresponds to Jain et al. [97], who documented salt-plant paste combinations for dysentery and gum pain among wetland-plant users in Manipur, and is consistent with the broader view that salt is added to mask astringency and enhance palatability in antipyretic and gastrointestinal remedies [88]. Across the three additives, rock sugar showed the broadest species association, its versatile and culturally preferred vehicle in this region — though whether this reflects genuine pharmacological preference, availability, or cost cannot be determined from UR data alone.

The study delivers a unique additive practice that has not been documented in prior research, to the best of our knowledge. It involves the application of a decoction made from *Cissus adnata*, mixed with a drop of monkey urine, for the treatment of urinary stones. Additionally, it describes the use of any animal bile mixed with the crushed juice of *Persicaria posumbu* as a remedy for chickenpox. As with the other additives, this remains an unvalidated folk formulation; given the unconventional nature of the additive, we recommend that it be flagged explicitly for future toxicological and microbiological screening before any consideration of therapeutic relevance, rather than being assumed to be safe or effective on the basis of traditional use alone.

Quantitative analysis and selection of candidate species

The quantitative ethnobotanical indices employed in this study — RFC, UV, and ICF — provide robust insights into the medicinal plant knowledge and utilization patterns among the two Naga tribes of Manipur. These indices highlight both culturally salient species and areas of strong traditional consensus, while also revealing gaps in shared knowledge. In concrete ethnobotanical literature, plants with elevated RFC, FL, and UV are often prioritized for pharmacological validation and conservation priorities, as frequent citation correlates with perceived reliability [4,84,103].

High RFC species reflect cultural salience and widespread recognition. *Brassaiopsis glomerulata* achieved the highest RFC value (0.544), indicating it is the most frequently cited medicinal plant and retains significant cultural importance among the Rongmeis and Tangkhuls in the study area. *B. glomerulata* is a highly versatile medicinal plant utilized in the area for the treatment of five distinct health issues, including kidney problems, hypertension, asthma, diabetes, and as a kidney tonic. *Phlogacanthus thyrsiformis* (RFC=0.399), for instance, is traditionally valued in the northeastern states of India for respiratory issues, jaundice, and other ailments, corresponding to its prominence in therapeutic practices [81,94,98,104,105]. The leaves of *P.thyrsiflorus thyrsiformis* are proven to possess analgesic, antioxidant, and anti-inflammatory activities [60]. This connects the ethnomedicinal knowledge of the communities with the established pharmacological activities. *Mikania micrantha* (RFC=0.284), despite its invasive alien status, is widely used across the region for wound healing, improving skin conditions, and as an antidote, demonstrating how local knowledge adapts to available resources. Such high RFC values suggest these species are well-integrated into the daily healing practices of the communities, likely due to their availability, efficacy perceptions, and multi-purpose uses. Conversely, the low RFC (0.002) for species such as *Alpinia nigra*, *Blumea flava*, and others points to rare or

specialized use, possibly limited by habitat specificity, seasonal availability, or knowledge held by fewer informants.

UV underscores versatility and therapeutic importance. Among the 131 taxa, *Phyllanthus emblica* exhibited the highest UV (0.026), being employed for eight distinct ailments. This is consistent with its well-documented status in Ayurvedic and folk traditions as a rejuvenative (rasayana) with antioxidant, hepatoprotective, and immunomodulatory properties, largely attributed to its high vitamin C and polyphenol content [106–108]. *Centella asiatica* and *Musa balbisiana* (UV= 0.024 each) also demonstrated notable versatility, revealing their broad applications in wound healing, digestive health, and general wellness. The findings aligned with studies from northeast India and other countries [85,103,109]. These species with elevated UV serve as promising species in traditional medicinal systems, warranting these taxa for conservation priorities. On the other hand, the relatively low UV may indicate a specialized pharmacopeia.

ICF reveals a clear consensus on certain categories of ailments. The highest ICF values, EAR-H (1.00), followed by CAR-K and BLD-B (0.97), demonstrate high consensus among informants for ear-related, cardiovascular, and blood-related disorders. The ICF values for most ailment categories exceeding 0.70 further affirm a cohesive body of medicinal knowledge among these Naga tribes, suggesting effective cultural transmission and shared experiential validation of plant remedies. The Digestive disorder (DIG-D) category utilized the highest number of species (81 spp.), with gastritis alone treated by 33 species, which is typical in ethnobotanical surveys from tropical and subtropical regions where gastrointestinal issues are prevalent due to dietary and environmental factors [2,88,110,111]. In contrast, the lower ICF for Neurological disorders (NEU-N, 0.68) indicates fewer informants and less shared knowledge, possibly due to the complexity of symptoms, stigma, or reliance on other healing modalities. Similar variability in ICF has been reported in studies from Northeast

797 India and elsewhere, where consensus is highest for common, easily diagnosable ailments
798 [4,84,89,105]. These results also correspond to findings from the Tangkhul Naga and
799 Zeliangrong communities of Ukhrul and Tamenglong districts of Manipur, where
800 gastrointestinal disorders also showed higher use reports and ICF, highlighting regional
801 patterns in ethnomedicine [2,18].

802 The high overall consensus supports the preservation of this indigenous knowledge
803 amid modernization and biodiversity loss. High RFC and UV plants like *Brassaiopsis*
804 *glomerulata*, *Phlogacanthus thyrsiformis*, and *Phyllanthus emblica* warrant pharmacological
805 investigation and clinical studies to bridge traditional knowledge with evidence-based
806 medicine.

807 ***Fidelity level and pharmacological relevance***

808 The highest FL is recorded for *Clerodendrum colebrookeanum* for hypertension. *C.*
809 *colebrookeanum* is a well-known medicinal plant among various ethnic groups of Manipur
810 and other northeastern states of India for regulating blood pressure [16,18,78,87]. A
811 pharmacological study on this species shows antihypertensive potential, including effects on
812 blood pressure, calcium antagonism, and inhibition of ROCK-II and PDE-5 [57], which
813 supports the traditional claim and suggests a plausible mechanism of action. Similarly, the
814 very high FL of *Mikania micrantha* and *Chromolaena odorata* for cuts and wounds
815 applications aligns with published work documenting wound-healing, anti-inflammatory, and
816 tissue-repair activities [59,65], indicating that these taxa are not only culturally important but
817 also biologically promising for topical applications. From Table 5, it is found that there are
818 some species with high FL for which no relevant pharmacological work is being carried out.
819 Thus, it opens a great opportunity for future phytochemical screening of these promising
820 species. The lower FL values observed in species like *Brassaiopsis glomerulata*, *Centella*

asiatica, *Cissus adnata*, and *Rhus chinensis* suggest that these plants are used for multiple ailments rather than a single well-defined indication. This indicates the diminished consensus regarding a particular therapeutic function, yet it does not diminish its medicinal significance; instead, it reflects a wider range of traditional applications of the species.

Cross-cultural analysis among the tribes

The comparison between the Rongmei and Tangkhul communities revealed limited overlap in the documented medicinal plant inventories. Only 21 of the 131 recorded taxa were shared, corresponding to a JI of 16.03%. This result indicates that the two communities maintain substantially differentiated documented pharmacopoeias, despite occupying the same broad regional landscape. Such differentiation may arise from the combined effects of local ecological conditions, language, cultural history, patterns of knowledge transmission, and community-specific healing practices rather than from plant availability alone [4,111,112]. The JI further quantifies this floristic overlap on a presence/absence basis and is consistent with the low-to-moderate similarity values reported when comparing traditional pharmacopoeias across neighboring but culturally distinct communities elsewhere [4,89,103,113].

However, the JI gives equal weight to every taxon and does not account for citation frequency or use intensity. Moreover, the number of recorded taxa differed markedly between the communities—116 in the Rongmei dataset and 36 in the Tangkhul dataset. Consequently, the low JI may reflect both genuine differences in medicinal knowledge and unequal sampling or sampling coverage. The comparison should therefore be interpreted as evidence of low overlap in the documented inventories, not as definitive proof of cultural divergence.

Taxonomic overlap alone does not indicate whether shared plants are used for the same therapeutic purposes. We therefore examined the 21 common taxa using RSI [53] and a

three-level concordance classification based on specific ailments and broader ICPC categories. Eleven taxa (52.4%) were used for the same specific ailment in both communities, including *Brassaiopsis glomerulata*, *Clerodendrum colebrookeanum*, and *Phlogacanthus thyrsoformis*. A further seven taxa (33.3%) were used for conditions within the same ICPC category but for different specific ailments. Only three taxa (14.3%)—*Elsholtzia blanda*, *Erythrina variegata*, and *Spondias pinnata*—showed no concordance at either level. The resulting RSI of 9.16% reflects the limited proportion of shared taxa that also converged in therapeutic use, while the three-tier analysis shows that low overall similarity did not mean complete therapeutic disconnection.

The relatively high proportion of shared taxa used for the same ailment may reflect knowledge exchange, common cultural inheritance, independent selection of plants with observable therapeutic value, or some combination of these processes. The present data cannot distinguish among these explanations. Nevertheless, repeated use of the same taxon for the same condition provides a rational basis for prioritizing species for phytochemical and pharmacological investigation. Such convergence should be regarded as a screening signal rather than as evidence of clinical efficacy. Conversely, the seven taxa that were retained within the same therapeutic domain but assigned different specific uses demonstrate why taxonomic similarity indices should be interpreted alongside use-level comparisons. Treating all shared taxa as functionally equivalent would obscure meaningful differences in therapeutic knowledge [53].

Plant-part use provided a second level of comparison. Leaves were the dominant plant part in both communities, accounting for 69.4% of plant-part use records among the Rongmei and 72.5% among the Tangkhul, with no significant difference reported between the groups. Whole-plant, bark, stem, and seed use also did not differ significantly. These shared patterns may indicate a common preference for plant materials that are accessible and relatively easy

870 to prepare. Because leaf use and oral administration are widespread in ethnobotanical studies,
871 however, their occurrence in this study should not be presented as a distinctive cultural
872 finding unless supported by a specific intertribal difference or ecological explanation.

873 In contrast, the distribution of several less frequently used plant parts differed between the
874 communities. Tangkhul records showed greater use of roots (8.02% versus 0.69%) and fruits
875 (12.10% versus 4.18%), whereas Rongmei records showed greater use of rhizomes (15.74%
876 versus 0.13%) and inflorescences (1.60% versus 0.38%); the reported comparisons for these
877 categories remained significant after the stated multiple-comparison correction. The root–
878 rhizome contrast is particularly informative because these underground organs may be treated
879 as functionally similar in some medicinal traditions, yet they were associated with different
880 community-level practices in the present dataset. Among the Rongmei, rhizome use was
881 concentrated in *Curcuma caesia* (UR = 58), *C. zanthorrhiza* (UR = 38), and *C. comosa* (UR =
882 90). Among the Tangkhul, root use was dominated by *Cissus adnata* (UR = 47) and *Eurya*
883 *acuminata* (UR = 14), which together accounted for 69.31% of root-use records. These
884 patterns suggest that the observed plant-part differences were driven not only by broad
885 category preferences but also by a relatively small number of culturally salient taxa.

886 Taken together, the results support H3 by demonstrating differences in the distribution of
887 plant parts used by the two communities. They also provide evidence of partial cultural
888 continuity: the tribes shared relatively few taxa, but more than half of those shared taxa were
889 used for the same specific ailment, and one-third were used within the same therapeutic
890 category. At the same time, the findings should not be used to confirm H2 as a purely cultural
891 explanation for intertribal divergence. The study did not independently measure plant
892 availability or floristic composition in the two districts, and the unequal numbers of recorded
893 taxa further limit direct comparison. The observed pattern is therefore consistent with
894 community-specific knowledge and practice, but ecological availability, sampling intensity,

and the geographic clustering of sampled villages may also have contributed. Future studies combining ethnobotanical inventories with standardized floristic surveys, equalized sampling effort, and broader village coverage would be required to separate these explanations more rigorously.

Overall, the cross-cultural analysis indicates that the Rongmei and Tangkhul pharmacopoeias are neither wholly shared nor wholly independent. They show low taxonomic overlap, substantial agreement for a subset of shared therapeutic uses, and distinct preferences in the use of several plant-part categories. This combination of convergence and differentiation emphasizes the value of analyzing both plant identity and therapeutic application when comparing indigenous medical systems.

Threats and conservation implications

The forests in Churachandpur and Kamjong are predominantly classified as Unclassed type—i.e., they lack statutory reserved or protected forest status [12]. Some are managed as community forests, where local custodians receive technical support from the state and can extract non-timber forest products for their livelihoods [32]. Several recorded taxa are of global conservation concern: *Aquilaria malaccensis* is assessed as Critically Endangered [114], and *Garcinia indica*, *Paris polyphylla*, and *Cinnamomum verum* as Vulnerable [115–117]. Most other taxa are assessed as Least Concern or Data Deficient. Those harvested by root or bark may still face higher risk if collection intensifies, and such taxa would benefit from monitoring even without a threatened listing. Habitat loss adds to this pressure. The two districts lost a reported 78 km² and 21.29 km² of forest during 2021–2023, with *jhum* cultivation, illegal poppy cultivation, forest fires, and encroachment among the reported drivers [12,25]. We did not map this loss against the habitats of the taxa recorded here, so its effect on their wild populations remains a plausible concern that needs field verification.

919 Conservation responses could therefore be matched to each species and site. Propagation and
920 reintroduction may suit the globally threatened taxa. Formal recognition and benefit-sharing
921 could strengthen community forests already under stewardship, while stricter protection may
922 suit areas outside active community use. Restoring fallow *jhum* land and community forest
923 with culturally important species could also support habitat recovery. We observed *Aquilaria*
924 *malaccensis*, *Carallia brachiata*, *Cinnamomum verum*, *Garcinia indica*, and *G. pedunculata*
925 being cultivated in village periphery and homesteads, mainly for economic and ornamental
926 purposes. Where such plantings rely on unselected, seed-propagated stock of uncertain origin,
927 and, for dioecious *Garcinia*, unverified sex, their economic and conservation value may be
928 limited. Training in artificial inoculation techniques may help growers obtain agarwood from
929 cultivated *A. malaccensis* and could ease pressure on wild trees, although resin formation is
930 slow and depends on market access.

931 ***Environmental and food sovereignty***

932 The highest-priority taxa identified through RFC and FL are drawn from the same community
933 forests and *jhum* fields that also supply food and other non-timber forest products —
934 including root-sourced species such as *Cissus adnata* and *Eurya acuminata*, central to
935 Tangkhul practice, and rhizome-sourced *Curcuma* spp. and understory taxa such as
936 *Goniothalamus sesquipedalis*, central to Rongmei practice. This overlap is also reflected
937 directly in species use: 45 of the 131 taxa (34.4 %) recorded in this study serve both an edible
938 and a medicinal purpose. Of these, 27 taxa are used in culinary (eg., *Ficus auriculata*,
939 *Gnetum gnemon*, *Rhynchoetechum ellipticum*, etc.), 13 as edible fruit (eg., *Garcinia*
940 *pedunculata*, *Rhus chinensis*), and 5 species as spices (eg., *Cinnamomum verum*, *Eryngium*
941 *foetidum*). This indicates the nutritional role alongside their therapeutic one. Several of these
942 dual-use species share a bitter taste — for instance, *Clerodendrum colebrookeanum*,
943 *Momordica charantia*, and *Prasoxylon excelsum* — which informants associated with

curative properties for hypertension and diabetes, and accordingly incorporated into the diet as a preventive food. This overlap between food and medicine has also been reported among tribal and indigenous communities elsewhere in India and abroad [1,15,118,119].

Given this shared landscape, conservation strategies focused solely on medicinally important species, without regard to the broader forest and agricultural systems that sustain both food and medicine, risk overlooking a landscape the two functions have in common.

Towards community-centered implementation of local knowledge

This documentation may also support community control over the knowledge it records. India's Biodiversity Management Committee (BMC) and People's Biodiversity Register (PBR) framework, established under the Biological Diversity Act, 2002, could provide a mechanism for this. Village-level BMCs in Churachandpur and Kamjong could potentially record the species, preparations, and vernacular names documented here within a community-controlled PBR, rather than leaving this information solely in academic literature. Such documentation could also help inform future access and benefit-sharing discussions, should any of the identified species attract external research or commercial interest. Returning findings to the communities in accessible, vernacular-name-organized formats — rather than by scientific binomial alone — may further allow informants and traditional practitioners to review, correct, and build on the record directly. Together, these steps could offer a basis for community-led conservation of the threatened and high-use species identified in this study, rather than making such action dependent on external projects or funding. These recommendations align with the participation and benefit-sharing commitments of the Kunming–Montreal framework (Targets 13 and 22) [27] and with the WHO strategy's call for culturally respectful integration of traditional medicine [26]. Before any pharmacological work on the species identified here, benefit-sharing arrangements under the Biological

968 Diversity Act, 2002 and the Nagoya Protocol should be agreed with the relevant village
969 committees [28,29].

970 ***Broader implications and transferability***

971 Four aspects of this study extend beyond Manipur. First, the two-tier comparison
972 (taxon overlap adjusted for inventory size, followed by ailment- and category-level
973 concordance of shared taxa) can be applied wherever communities share a flora but differ in
974 documented inventory size, and it separates two questions that single similarity indices
975 conflate: which plants are used, and for what. Second, convergence of the same ailment for
976 the same taxon across culturally distinct communities is an inexpensive and transferable
977 screening signal that can be combined with fidelity and prior pharmacology, as in Table 5.
978 Third, invasive alien plants (*Mikania micrantha*, *Chromolaena odorata*, *Tithonia diversifolia*)
979 appear among the medicines recorded here, a widely reported pattern of local knowledge
980 absorbing new species; this offers a possible use for species that management programmes
981 seek to control, provided safety is assessed. Fourth, the overlap between food and medicine
982 (45 of 131 taxa) and the dependence of both on community forests and *jhum* landscapes mean
983 that health, food and conservation policy should be planned together. The Indo-Myanmar
984 hotspot, where Naga and related communities span national borders, is a natural setting in
985 which to test these approaches across jurisdictions.

986 ***Novelty of the study***

987 This study documents the first ethnomedicinal inventory for the Rongmei and Tangkhul Naga
988 tribes specifically in the Churachandpur and Kamjong districts, filling a geographical gap left
989 by prior work confined to Tamenglong, Noney, and Ukhrul. The therapeutic application of
990 *Phoebe lanceolata* (Nees) Nees for alleviating muscle pain and culinary use by the Tangkhul
991 community is documented here for the first time in India, to the best of our knowledge.

Beyond the taxonomic record itself (131 taxa across 57 families), the principal novelty of this study lies in three findings that have no clear precedent in the regional literature. First, the use of burnt *Goniothalamus sesquipedalis* ash to treat gastritis, fever, and ward off evil spirits among the Rongmei represents a preparation method not previously reported in India. Second, the administration of *Cissus adnata* decoction combined with a drop of monkey urine for urinary stones and the use of any animal bile mixed with the crushed juice of *Persicaria posumbu* as a remedy for chickenpox constitutes an animal-derived additive practice with no known prior documentation. Third, this study applies a two-tiered cross-cultural comparison, combining RSI with an ailment-versus-category concordance breakdown (Table 6), that moves beyond simple taxonomic similarity indices such as Jaccard. This approach demonstrates that low floristic overlap between geographically proximate tribes (16.03% JI) does not translate into a proportionally low use-concordance, as 52.4% of shared taxa converge on the same specific ailment. This distinction is rarely made explicit in prior cross-cultural ethnopharmacological studies in Northeast India.

Summary of hypothesis tests

The study does not support the hypothesis (H1) that ethnomedicinal knowledge is associated with informant demographics, as none of the demographic variables tested showed a significant association with plant-use knowledge in either community. In fact, the hypothesis (H2) of limited overlap in taxa and uses was supported descriptively: JI = 16.03% (partly a consequence of unequal inventory size; overlap coefficient 58.3%), RSI = 9.16%, and selectively divergent part-use profiles. The results found that the plant-part usage proportions differed between tribes. Five of ten plant-part categories differed significantly between tribes after Bonferroni correction, unlike the five parts including the dominant leaves category.

Limitations of the study and future recommendations

The study's findings are limited to two Naga tribes in two selected districts of Manipur; including other Naga tribes from Manipur and other northeastern states could provide a more comprehensive understanding of cross-cultural ethnomedicinal knowledge. This study solely depends on informants' self-reported data; it could be influenced by recall bias. Occasionally used plants, old remedies, dosage details, and treatments used only in emergencies may be forgotten or incompletely reported. Additionally, no traditional healers were represented among the interviewed informants, as none of the available and willing participants identified as such. Consequently, this study captures general community-level ethnomedicinal knowledge and may not fully reflect more specialized or restricted knowledge held by recognized healers, which could differ in scope or complexity from that documented here. Furthermore, the study lacked experimental assessment of the medicinal efficacy or toxicity of the documented plants. All therapeutic applications reported are exclusively grounded in traditional knowledge and informant consensus. The study should be interpreted as a scientifically documented account of indigenous medicinal plant knowledge and as a basis for future pharmacological and conservation research, rather than as clinical validation of the reported remedies. Future research incorporating phytochemical screening and toxicity assessments on these potential species should be encouraged, as it could provide broader healthcare benefits.

Conclusion

This study provides the first ethnomedicinal documentation of the Rongmei and Tangkhul Naga tribes in the Churachandpur and Kamjong districts. It closes a geographic gap left by earlier work confined to Tamenglong, Noney, and Ukhrul. Beyond the inventory itself, it contributes a quantitative, two-tiered framework for cross-cultural comparison, combining taxonomic overlap with ailment-level concordance. This framework reveals a more nuanced

picture than similarity indices alone can offer. Low floristic overlap between the two communities does not translate into proportionally low agreement in how shared species are used. This pattern is more consistent with culturally shaped than purely ecologically driven divergence. The study also documents preparation practices and species not previously reported in the regional literature, and it identifies a shortlist of high-priority taxa for future pharmacological and conservation attention. Taken together, these findings offer both a documentary record and a methodological approach that future ethnomedicinal studies in the region could build on.

List of abbreviations: ICF- Informant Consensus Factor, FL- Fidelity Level, RFC- Relative Frequency of Citation, UV- Use Value, UR- Use Report, JI- Jaccard Similarity Index, RSI- Rahman Similarity Index, CR- Critically Endangered, VU-Vulnerable, LC-Least Concern, DD-Data Deficient, EHSST- East Himalayan Society for Spermatophyte Taxonomy, ISE- International Society of Ethnobiology, PDE-5 - (Phosphodiesterase Type 5), ROCK-II -Rho-associated kinase 2.

Declaration

Ethics approval and consent to participate

Prior to conducting the field survey, we obtained consent from all the village authorities. Informants were thoroughly briefed on the study's objectives before the interviews, and verbal consent was secured and subsequently documented, adhering to the ISE Code of Ethics and guidelines. The Research Ethics Committee of the Department of Forestry, Manipur University, approved the methodology on 10th June 2024 (No.- MU/FOR/REC/2024/June-01).

Consent for publication: Not applicable.

Availability of data and materials: All the data generated or analyzed in the study were included in the manuscript. Additional supporting data of the current study are available from the corresponding author on reasonable request.

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1069 **Authors' contribution:** RP supervised the study, designed the methodologies, analyzed data,
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Figure Legends

Figure 1: Map of Manipur showing the study sites in Churachandpur and Kamjong districts

Figure 2. Photographs illustrating interaction with informants in (A)- Kamjong, (B)- Churachandpur;

Medicinal plants collected in the field through guided forest walk (C)- *Paris polyphylla*, (D)- *Brassaiopsis glomerulata*, (E)- *Garcinia indica*, (F)- *Clerodendrum colebrookeanum*, (G)- *Garcinia pedunculata*, (H)- *Berberis napaulensis*

Figure 3. Plant-use knowledge (mean $\pm$ SD) by gender, Rongmei and Tangkhul communities (Wilcoxon rank-sum test; both comparisons not significant, $p>0.05$)

Figure 4. Plant-use knowledge (mean $\pm$ SD) by education (A & C) and Age class (B & D) among the Rongmei and Tangkhul communities (Kruskal-Wallis χ^2 test; all comparisons non-significant, $p > 0.05$).

Figure 5. Plant parts used in the treatment of different ailment categories; the left half shows plant parts, and the right half shows ailment categories with UR.

Figure 6. Plant parts used and modes of preparation, weighted by UR; the left half shows plant parts, and the right half shows modes of preparation.

Figure 7. Route of administration of medicinal plant preparations

Figure 8. Venn diagram showing the number of species used by Rongmei and Tangkhul, and the JI and RSI%.

Figure 9: Proportion of medicinal plant parts used among the two Naga tribes depicted based on the UR, applying Fisher's exact test with Bonferroni correction ($\alpha=0.005$), for each plant part.

Table caption

Table 1. Basic information on the selected villages

Table 2. Demographic profile of the informants in Churachandpur and Kamjong districts

Table 3. Ethnopharmacology and medicinal plants used by the Rongmei and Tangkhul Naga tribes of Manipur.

Table 4. Informant Consensus Factor for various ailment categories

Table 5. Fidelity Level of species with > 40 UR

Table 6. Concordance of therapeutic application among the 21 medicinal taxa common to the Rongmei and Tangkhul Naga communities

Appendix 1. Questionnaire for ethnomedicinal data collection

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Appendix1.docx](#)
- [PlantpartPairwiseFisherBonferronitestresult.xlsx](#)
- [Supplementary2KruskalWallisEducation.xlsx](#)
- [Supplementary1WilcoxonGender.xlsx](#)
- [Supplementary3KruskalWallisAgeClass.xlsx](#)