



RESEARCH ARTICLE

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Antifever medicinal plants on native ethnics on Sumatra Island

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ABSTRACT

Background: Fever is a health disorder characterized by an increase in body temperature above normal, which almost everyone experiences. Therefore, the selection of fever is expected to provide an overview of how the knowledge of Sumatra ethnic communities in fever treatment is generally processed.

Methods: Research metadata of medicinal plants and *jamu* conducted by the Ministry of Health in 2012, 2015 and 2017 became the main sources. The study was conducted by interview and field observation methods to obtain medicinal plants. The informants of this study are traditional healers in every ethnic community in all provinces in Sumatra. Dummy tables containing provinces, ethnic, family, medicinal plants, potion numbers and traditional healers' codes were analyzed by Bray-Curtis similarity analysis based on the use of medicinal plants to obtain a level of similarity between ethnics and followed by scatterplots display using non-metric multidimensional scaling analysis.

Results: Medicinal plants usage by traditional healers in Sumatra has a low similarity among ethnic groups because the similarity index value to approximate zero. It shows that the group is quite specific in relation to the surrounding natural resources.

Conclusion: The low similarity index between ethnic groups in Sumatra shows that traditional medicinal knowledge among them is not interrelated. Their knowledge of developing hereditary based on experience and availability of natural resources around them.

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KEYWORDS

Diversity, ethnomedicine, fever, local wisdom, similarity.

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Introduction

As an archipelago, Indonesia has a considerable amount of ethnic and flora. The number of ethnic based on major groups as much as 633 group (1), while the flora reaches 20,000 species (2). The assets of ethnic and plants constitute a local intellectual knowledge with each traditional community that includes a wealth of knowledge about medicine using their surrounding natural materials. Local wisdom depends on location and time (3).

Regional isolation and culture have created different characteristics in the use of resources in different ethnicities, resulting in different local wisdom.

The role of local knowledge of ethnic communities in efforts to conserve natural resources and biodiversity is recognized in the 1994 Convention on Biological Diversity. A deeper understanding of the relationship between social and ecological dynamics results from studies of patterns of local use of natural resources, social and institutional backgrounds that guide the relationship between humans and nature (4). Management of natural resources based on local wisdom must be maintained because of the philosophy that makes it a heritage habitat for their survival (5)

Sumatra as a large island along with small islands around it, stretching from Aceh to Lampung Province, is one of seven regions in Indonesia historically the origin of an ethnic community (6). There are 70 indigenous ethnic groups inhabiting the area (7).

While Sumatra's rainforest has been declining year after year, it is possible to meet several other islands in Indonesia and a relatively large number of plasma. Sumatran, which measures the size of Sumatran forest in 2015, also has reached 11,56 million acres (8). The natural assets of Sumatra's forests are widely used by communities living nearby because of their efforts to stay healthy. Remote areas far from medical facilities, making the community strives to maintain their health by utilizing the natural resources that exist around them, thus becoming a local wisdom that is hereditary and performed by traditional healers in each ethnic group.

Research of medicinal plants and *jamu* that are implemented by the Ministry of health in 2012 until 2017 has been producing ethnomedicine potion metadata and plants are used from the entire territory of Indonesia. Increased economic development and expand the mobilization of people. Acculturation is not inevitable. Considering the conditions, based on potions medicinal plants used, researchers want to see whether there are similarities in the treatment methods of

traditional healers from ethnic groups on the island of Sumatra.

Materials And Methods

Study area

The research data is taken from the metadata of Medicinal Plants and *Jamu* Research (RISTOJA) conducted in 2012, 2015 and 2017. The research was conducted by interviewing informants (traditional healers) in each of the ethnic groups and field observations to find species of medicinal plants used in the process treatment. Interviews were conducted by anthropologists, whereas observations of medicinal plants were carried out by botanists. Informants were selected based on public information, followed by a snowball sampling method to obtain further informant. The location focus is all ethnicities in the Province on Sumatra Island, from Aceh to Lampung (figure 1). The data needed includes all potions for fever without considering the trigger factors. Data includes provinces, ethnic names, and scientific names of plants.

Data analysis

The similarity analysis to the presence and absence of medicinal plant use between ethnic groups was carried out using Bray-Curtis similarity analysis (9). The Bray-Curtis similarity analysis is a nonparametric multivariate comparison within and between groups. This resulted in a global test of statistics called R, which ranges from -1 to 1 with a value close to zero that showed no similarities at all. $R < 0.25$: indicates there is little resemblance, $0.25 \leq R \leq 0.75$: some similarities though overlapping, $R > 0.75$ groups have many similarities, and $R : 1$ is identical. Further data were analyzed with the ordination of a Non-Metric Multidimensional Scaling (NMDS) (10). Based on the NMDS obtained ordination visualization in two dimensional graphics regarding the degree of similarity between the ethnic maps in Sumatra based on the use of medicinal plants. Data were analyzed with software Paleontological Statistics (PAST) version 3:20 (11).

Results

The study was conducted by interview method and field observation of 455 traditional healers from 10 provinces in Sumatra. Data was filtered with only the potions for fever selected. There were 242 traditional healers from 67 ethnics who have potions for fever, with a total number of 347 potions. The medicinal plant species used were 320 species from 100 families, as shown in Table 1.

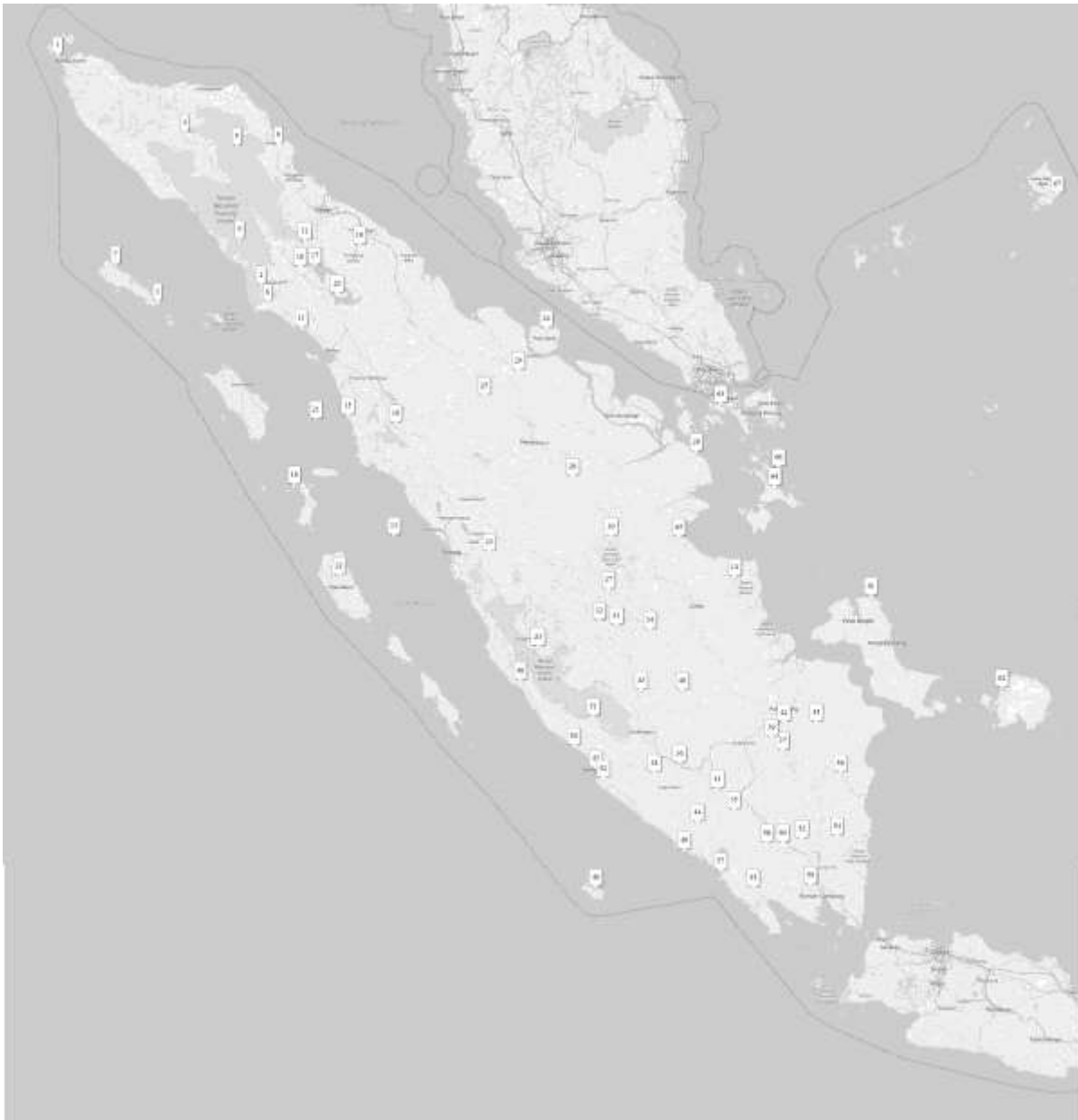


Figure 1. Research map of ethnicities. 1: Aceh; 2: Alas; 3: Devayan; 4: Gayo; 5: Gayo Serbajadi; 6: Kluet; 7: Sigulai; 8: Singkil; 9:Tamiang; 10: Angkola; 11: Barus; 12: Karo; 13: Mandailing; 14: Melayu; 15: Natal; 16: Nias; 17: Pakpak; 18: Siladang; 19:Simalungun; 20: Toba; 21: Ulu; 22: Mentawai; 23: Minangkabau; 24: Akit; 25: Bonai; 26: Duano Laut; 27: Hutan; 28: Petalangan; 29: Sakai; 30: Talang Mamak; 31: Anak Dalam; 32: Bhatin; 33: Kerinci; 34: Pindah; 35: Daya; 36: Kikim; 37: Komering; 38: Lintang; 39: Meranjat; 40: Musi; 41: Ogan; 42: Pegagan; 43: Rawas; 44: Semendo; 45: Teloko; 46: Enggano; 47: Lebak; 48: Muko-Muko; 49:Pasemah; 50: Pekal; 51: Rejang; 52: Serawai; 53: Abung Kota Bumi; 54: Abung Seputih; 55: Lampung Pesisir; 56: Mesuji; 57:Peminggir; 58: Pepadun; 59: Pubian; 60: Sungkai Bunga Mayang; 61: Lom; 62: Sawang; 63: Laut; 64: Lingga; 65: Mantang; 66: Melayu Lingga; 67: Melayu Natuna

Table 1. List of species of medicinal plants by ethnic users

Family	Species	Ethnic(local names)
Acanthaceae	<i>Andrographis paniculata</i> (Burm. F) Nees	6 (<i>on pee</i>), 65 (<i>sabaroto</i>)
	<i>Avicennia marina</i> (Forssk.) Vierh.	63 (<i>api-api laut</i>)
	<i>Avicennia sp.</i>	66 (<i>api-api</i>)
	<i>Graptophyllum pictum</i> (L.) Griff.	16 (<i>najolu safusi</i>)
	<i>Justicia gendarussa</i> Burm. F	2 (<i>bebesi/sepilit</i>), 11 (<i>sipilit</i>), 12 (<i>besi-besi/sampe sempilet mbiring/sampe sempilet meratah</i>), 28

Family	Species	Ethnic(local names)
Acoraceae	<i>Acorus calamus</i> L.	(<i>andouso</i>), 40 (<i>gandarusa hitam</i>), 48 (<i>setajam hitam</i>), 49 (<i>sekajang hitam/putih</i>), 57 (<i>gondoroso</i>) 1 (<i>jariangau</i>), 19 (<i>jarango</i>), 28 (<i>jangau/jeringo</i>), 29 (<i>jerange/dringo</i>), 42 (<i>jeringo</i>), 51 (<i>mulei/jelangau</i>), 64 (<i>jerangau</i>)
Actinidiaceae	<i>Saurauia pedunculata</i> Hook.	13 (<i>ingor-ingor</i>)
Amaranthaceae	<i>Celosia argentea</i> L.	50 (<i>bungo meluh</i>)
	<i>Allium cepa</i> L.	12, 27, 28, 29, 37, 39, 40, 41, 52, 63, 62 (<i>bawang merah</i>)
	<i>Allium ramosum</i> L.	58 (<i>kurasa</i>)
	<i>Allium sativum</i> L.	8, 12, 28, 29, 37, 62, 67 (<i>bawang putih</i>)
	<i>Crinum asiaticum</i> L.	2 (<i>ketembo</i>), 12 (<i>empu-empu</i>)
	<i>Hymenocallis littoralis</i> (Jacq.) Salisb.	65 (<i>bawang hutan</i>)
	<i>Proiphys amboinensis</i> (L.) Herb.	2 (<i>sepulih</i>)
	<i>Zephyranthes</i> sp.	60 (<i>kerasa berak bulung</i>)
Anacardiaceae	<i>Spondias dulcis</i> Parkinson	45 (<i>kedondong</i>)
Annonaceae	<i>Annona muricata</i> L.	9 (-), 14 (<i>nangka belanda</i>), 26 (<i>durian belanda</i>), 29 (<i>durian belanda/sirsak</i>), 40 (<i>nangko belando</i>), 42 (<i>nangka belanda</i>), 46 (-), 50 (-), 51 (-), 65 (<i>duyen belande</i>)
	<i>Cananga odorata</i> (Lam.) Hook.f. & Thomson	42 (<i>kenanga</i>), 47 (<i>nangeh</i>)
Apiaceae	<i>Apium graveolens</i> L.	45 (<i>daun sop</i>)
	<i>Centella asiatica</i> (L.) Urb.	12 (<i>ukat ukat</i>)
	<i>Coriandrum sativum</i> L.	37 (<i>ketumbar</i>)
	<i>Eryngium foetidum</i> L.	2 (<i>hinggu</i>)
	<i>Petroselinum crispum</i> (Mill.) Fuss	58 (<i>ranji</i>)
Apocynaceae	<i>Alstonia scholaris</i> (L.) R. Br.	29, 51 (<i>pulai</i>), 45 (<i>pelawi</i>)
	<i>Tabernaemontana divaricata</i> (L.) R.Br. ex Roem. & Schult.	2, 48 (<i>bungo susun</i>), 6 (<i>bungong suson</i>)
Aquifoliaceae	<i>Ilex cymosa</i> Blume	62, 63 (<i>mesirah</i>)
Araceae	<i>Furtadoa sumatrensis</i> M.Hotta	52 (<i>jerangau batu</i>)
	<i>Pistia stratioites</i> L.	44 (<i>kiambang</i>)
Araliaceae	<i>Arthrophyllum diversifolium</i> Blume	61 (<i>juluk antu</i>)
Arecaceae	<i>Areca catechu</i> L.	3 (<i>elar</i>), 12 (<i>pinang muda/mayang</i>), 23 (<i>pinang kampuang</i>), 48, 29 (<i>pinang</i>), 34 (<i>anak pinang tembatan</i>)
	<i>Arenga pinnata</i> (Wurmb) Merr.	12 (<i>pola</i>), 52 (<i>air nira</i>)
	<i>Calamus manan</i> Miq.	23 (<i>aka manau</i>)
	<i>Caryota mitis</i> Lour.	12 (<i>riman</i>)
	<i>Caryota</i> sp.	12 (<i>ndudur</i>)
	<i>Cocos nucifera</i> L.	1, 2, 6, , 8, 33, 44, 51, 52, 53, 58, 61, 62, 64 (<i>kelapa</i>), 32, 45, 48 (<i>kelapo</i>)
	<i>Cyrtostachys renda</i> Blume	29 (<i>pinang merah</i>)
	<i>Pinanga</i> sp.	29 (<i>buwing</i>)
Asclepiadaceae	<i>Hoya</i> sp.	12 (<i>tawar ipoh</i>), 29 (<i>sirih hutan</i>)
Asparagaceae	<i>Cordyline fruticosa</i> (L.) A.Chev.	12 (<i>kaling juhang</i>), 55 (<i>andakhuwang suluh</i>), 48 (<i>jeluang balik</i>), 49 (<i>senderuing/ senderwing</i>)
	<i>Dracaena angustifolia</i> (Medik.) Roxb.	48 (<i>jeluang hutan</i>), 58 (<i>suji</i>)
	<i>Dracaena maingayi</i> Hook.f.	22 (<i>tai belek silaklak</i>)
Asteraceae	<i>Adenostemma lavenia</i> (L.) Kuntze	3 (<i>aliotok</i>), 49 (<i>pepulut</i>)
	<i>Ageratum conyzoides</i> L.	3 (<i>silambui</i>), 7 (<i>galiotok</i>), 12 (<i>bangur-bangur</i>), 15 (<i>kuma-kuma</i>), 43 (<i>gentang babi</i>)
	<i>Blumea balsamifera</i> (L.) DC.	29 (<i>daun coku</i>), 35 (<i>capa</i>), 40 (<i>cape</i>), 43, 46, 54 (<i>capo</i>), 52 (<i>daun capao gantung</i>), 57, 59 (<i>bulung capa</i>)

Family	Species	Ethnic(local names)
	<i>Cyanthillium cinereum</i> (L.) H. Rob.	41 (<i>sawi langit</i>)
	<i>Dichrocephala integrifolia</i> (L.f.) Kuntze	19 (<i>suwawa</i>)
	<i>Elephantopus scaber</i> L.	65 (<i>tutuk bumi</i>)
	<i>Endiandra</i> sp.	64 (<i>barah otak</i>)
	<i>Enydra fluctuans</i> Lour.	23 (<i>cikarau/sikarau</i>), 48 (<i>cegrau</i>)
	<i>Gynura procumbens</i> (Lour.) Merr.	8 (<i>sipulih sambung nyawa</i>), 45 (<i>penyambung nyawa</i>)
	<i>Lactuca indica</i> L.	65 (<i>sedu itik</i>)
	<i>Melanthera biflora</i> (L.) Wild	26 (<i>daun sunai laut</i>)
	<i>Mikania micrantha</i> Kunth	12 (<i>sala merdeka</i>), 13 (<i>sirompas para</i>), 55 (<i>wait masam</i>)
Balsaminaceae	<i>Impatiens balsamina</i> L.	13 (<i>bunga pancur</i>)
	<i>Impatiens platypetala</i> Lindl.	12 (<i>bunga pancur</i>), 12 (<i>bunga sapa</i>), 13 (<i>katirangga</i>)
Bignoniaceae	<i>Impatiens steenisii</i> Grey-Wilson	12 (<i>bulung kiung</i>)
	<i>Crescentia cujete</i> L.	56 (<i>labu kayu</i>)
	<i>Oroxylum indicum</i> (L.) Kurz	11 (<i>habang-habang</i>), 47 (<i>kapung</i>)
	<i>Spathodea campanulata</i> P. Beauv.	6 (<i>reudeup</i>)
Blechnaceae	<i>Stenochlaena palustris</i> (Burm. f.) Bedd.	28 (<i>pakis</i>)
Bombacaceae	<i>Ceiba pentandra</i> (L.) Gaertn.	5 (<i>kekabu</i>), 7 (<i>gapai</i>), 25 (<i>kakabu</i>), 29, 35, 40, 42, 45, 46, 50 (<i>kapuk</i>), 51, 54 (<i>randu</i>), 58 (<i>kapok</i>)
	<i>Durio zibethinus</i> L.	11, 17, 29, 32, 52 (<i>durian</i>), 31 (<i>duren/durian</i>), 45 (<i>duren</i>)
Bromeliaceae	<i>Ananas comosus</i> (L.) Merr.	12 (<i>kenas</i>), 43 (<i>nanas hijau</i>)
Calophyllaceae	<i>Calophyllum inophyllum</i> L.	15 (<i>daun pinago</i>)
Cannabaceae	<i>Trema tomentosa</i> (Roxb.) H. Hara	66 (<i>mengkirai</i>)
Cannaceae	<i>Canna indica</i> L.	48 (<i>pisang sebih</i>)
Capparidaceae	<i>Cleome ruidosperma</i> DC.	49 (<i>kekelam</i>)
Caricaceae	<i>Carica papaya</i> L.	2 (<i>petella</i>), 3 (<i>iamor</i>), 13 (<i>botik</i>), 17 (<i>botik/pepaya</i>), 37 (<i>pepaya</i>), 50 (<i>daun kates lanang</i>), 58 (<i>punti kayu ragah</i>), 60 (<i>gedang agah</i>), 62 (<i>daun katis</i>), 15 (<i>pucuk aru</i>), 62 (<i>ruk</i>)
Casuarinaceae	<i>Casuarina equisetifolia</i> L.	52 (<i>daun manggis</i>), 60 (<i>manggis</i>)
	<i>Garcinia mangostana</i> L.	15 (<i>ketaping</i>)
Clusiaceae	<i>Terminalia catappa</i> L.	28 (<i>kalimayo</i>),
Combretaceae	<i>Cnestis</i> sp.	29 (<i>pial ayam pucuk merah/putih</i>)
Connaraceae	<i>Rourea asplenifolia</i> (G. Schellenb.) Jongkind	11 (<i>ubi jalar</i>), 45 (<i>ubi sile siluman</i>)
	<i>Ipomoea batatas</i> (L.) Lam.	15 (<i>tapak kudo</i>)
Convolvulaceae	<i>Ipomoea pes-caprae</i> (L.) R. Br.	25 (<i>ketela</i>)
	<i>Ipomoea pes-tigridis</i> L.	44 (<i>pacng</i>)
	<i>Costus arabicus</i> L.	6 (<i>reubong sitabeu</i>), 23, 66 (<i>sitawa</i>), 28 (<i>setawar</i>), 30 (<i>sitawar</i>), 31 (<i>tobu pungguk</i>), 44 (<i>pacng</i>), 46 (<i>khori</i>), 48 (<i>setawa</i>)
Costaceae	<i>Costus speciosus</i> (koen.) J.E. Smith	14 (<i>sidingin/cocor bebek</i>), 16 (<i>sidingin batu</i>), 17 (<i>dingdingin/dingin-dingin</i>), 26, 27, 28, 31, 32, 44, 52, 62 (<i>sedingin/seredingin/cocor bebek</i>)
	<i>Bryophyllum pinnatum</i> (Lam.) Oken	44 (<i>setumbuh</i>)
Crassulaceae	<i>Kalanchoe blossfeldiana</i> Poelln.	2 (<i>dindingen/tawar teruh</i>), 4 (<i>dedingin</i>), 7, 16 (<i>sidingin</i>), 8 (<i>dindingin</i>), 14, 48 (<i>sedingin</i>), 19 (<i>cocor bebek</i>)
	<i>Kalanchoe laciniata</i> (L.) DC.	23 (<i>sidingin</i>)
	<i>Kalanchoe pinnata</i> (Lam.) Pers.	32, 41, 48, 50 (<i>kundur</i>)
	<i>Benincasa hispida</i> (Thunb.) Cogn.	8 (<i>semangka</i>), 60 (<i>semaka</i>)
Cucurbitaceae	<i>Citrullus lanatus</i> (Thunb.) Matsum. &	

Family	Species	Ethnic(local names)
	Nakai	
	<i>Cucumis sativus</i> L.	41 (<i>timun</i>)
	<i>Scleria sumatrensis</i> Retz.	12 (<i>sayat-sayat</i>), 15 (<i>umbuik sianik</i>)
Cyperaceae	<i>Nephrolepis biserrata</i> (Sw.) Schott.	29 (<i>pakis gajah</i>), 66 (<i>paku uban</i>)
Davalliaceae	<i>Dillenia excelsa</i> (Jack) Martelli ex Gilg.	28 (<i>cimpu</i>)
Dilleniaceae	<i>Dillenia reticulata</i> King	49 (<i>keluncup/simpur abang</i>)
	<i>Tetracera scandens</i> (L.) Merr.	23 (<i>aka ampaleh</i>), 24 (<i>emplas</i>)
	<i>Dioscorea alata</i> L.	49 (<i>hubi hitam</i>)
Dioscoreaceae	<i>Diospyros</i> sp.	30 (<i>salai-salai</i>), 40 (<i>dian</i>)
Ebeniaceae	<i>Hippochaete debilis</i> (Roxb. ex Vaucher) Ching	12 (<i>sendep-sendep</i>)
Equisetaceae	<i>Aleurites moluccana</i> (L.) Willd.	12 (<i>kembiri</i>), 17 (<i>kemiri</i>), 19 (<i>gambiri/kemiri</i>), 40 (<i>kemiling</i>)
Euphorbiaceae	<i>Euphorbia hirta</i> L.	6 (<i>naleung dadeh</i>), 8 (<i>ubar susu</i>)
	<i>Euphorbia tirucalli</i> L.	29 (<i>sueh tulang</i>)
	<i>Jatropha curcas</i> L.	13 (<i>dulang-dulang huta</i>), 26 (<i>jarak putih</i>), 29 (<i>jarak</i>), 33 (<i>jirak</i>), 40 (<i>jarak pagar</i>)
	<i>Macaranga gigantea</i> (Reichb.f. & Zoll.) Mull.Arg.	29 (<i>sekubin</i>)
	<i>Macaranga indica</i> Wight	6 (<i>sapek</i>)
	<i>Macaranga</i> sp.	32 (<i>tema</i>)
	<i>Mallotus macrostachyus</i> (Miq.) Müll.Arg.	52 (<i>siap kutu</i>)
	<i>Mallotus paniculatus</i> (Lam.) Müll.Arg.	11 (<i>sibalik angin</i>)
	<i>Mallotus philippensis</i> (Lmk) M.A.	40 (<i>pedas puntung</i>)
	<i>Manihot esculenta</i> Crantz	58 (<i>kekim nekan</i>)
	<i>Manihot utilissima</i>	4 (<i>ubi kayu</i>)
	<i>Ricinus communis</i> L.	12 (<i>lulang</i>), 19 (<i>dulang merah/dulang putih</i>)
	<i>Acacia mangium</i> Willd.	67 (<i>akiasia</i>)
Fabaceae	<i>Acacia tortuosa</i> (L.) Willd.	6 (<i>bungong rom</i>)
	<i>Caesalpinia sappan</i> L.	47 (<i>kayu sepang</i>)
	<i>Cajanus cajan</i> (L.) Millsp.	60 (<i>retak kayu</i>)
	<i>Canavalia ensiformis</i> (L.) DC.	48 (<i>kacang parang</i>)
	<i>Cassia roxburghii</i> DC.	15 (<i>marungge lawik</i>)
	<i>Cassia siamea</i> Lam.	29 (<i>kayu jua</i>)
	<i>Derris elliptica</i> (Roxb.) Bth.	61 (<i>tuba</i>)
	<i>Derris scandens</i> (Roxb.) Benth.	63 (<i>pialu</i>)
	<i>Derris trifoliata</i> Lour.	63 (<i>tuba laut</i>)
	<i>Erythrina subumbrans</i> (Hassk.) Merr.	57 (<i>redak</i>)
	<i>Erythrina variegata</i> L.	60 (<i>dadap minyak</i>)
	<i>Millettia</i> sp.	24 (<i>sejangat</i>), 28 (<i>kayu tulang daing</i>)
	<i>Mimosa invisa</i> Mart. ex Colla	18 (<i>dubi kucingan</i>), 28 (<i>sekejut</i>)
	<i>Mimosa pudica</i> L.	18 (<i>dubi sirput</i>), 34 (<i>serai</i>), 64 (<i>putri malu</i>)
	<i>Pachyrhizus erosus</i> (L.) Urb.	29 (<i>mengkuang</i>)
	<i>Psophocarpus tetragonolobus</i> (L.) D.C.	12 (<i>bereng</i>)
	<i>Senna alata</i> (L.) Roxb.	52 (<i>gelinggang kecil</i>)
	<i>Senna tora</i> (L.) Roxb.	42 (<i>kacang-kacangan</i>)
	<i>Tamarindus indica</i> L.	52 (<i>asam jawa</i>), 62, 63 (<i>asam/asam jawa</i>)
	<i>Vigna radiata</i> (L.) R. Wilczek	33 (<i>kacang padoi</i>)
	<i>Vigna unguiculata</i> subsp. <i>sesquipedalis</i> (L.) Verdc.	23 (<i>kacang tujuh halai daun</i>)
	<i>Dicranopteris linearis</i> (Burm. f.) Underw.	28 (<i>resam</i>), 29 (<i>esam</i>), 32 (<i>resam</i>)
Gleichcheniaceae	<i>Scaevola taccada</i> (Gaertn.) Roxb.	15 (<i>subang-subang</i>), 16 (<i>tanaju dawa/subang-subang</i>), 62 (<i>ambong-ambong/ambung-ambung/benak/kumak/kesembung laut</i>)
Goodeniaceae	<i>Heliconia collinsiana</i> Griggs	48 (<i>pisang mali</i>)

Family	Species	Ethnic(local names)
Heliconiaceae	<i>Dichroa febrifuga</i> Lour.	34 (<i>rengit dareh</i>)
Hydrangeaceae	<i>Hyptis capitata</i> Jacq.	11 (<i>simarangin-angin</i>), 12 (<i>suntil-suntil</i>)
Lamiaceae	<i>Ocimum americanum</i> L.	67 (<i>ruku-ruku</i>)
	<i>Ocimum basilicum</i> L.	14 (<i>selasi</i>), 36, 48, 50 (<i>selasih</i>), 43 (<i>selasih ulung</i>), 52 (<i>selasia</i>), 63 (<i>selaseh</i>)
	<i>Ocimum gratissimum</i> L.	16 (<i>sulasi</i>)
	<i>Ocimum tenuiflorum</i> L.	29, 45, 51 (<i>selasih</i>), 50 (<i>semangi/ukui</i>)
	<i>Plectranthus amboinicus</i> (Lour.) Spreng.	29 (<i>daun ketumbar</i>), 48 (<i>bangun-bangun</i>)
	<i>Plectranthus scutellarioides</i> (L.) R.Br.	28 (<i>ati-ati</i>), 48 (<i>pirung</i>)
	<i>Pogostemon auricularius</i> (L.) Hassk.	19 (<i>simarihur ihur ni asuh</i>)
	<i>Cassytha filiformis</i> L.	63 (<i>akar emas</i>)
Lauraceae	<i>Cinnamomum burmanni</i> (Nees & T.Nees) Blume	50 (<i>kayu manis</i>)
	<i>Cinnamomum rhynchophyllum</i> Miq.	29 (<i>lawang</i>), 30 (<i>modang</i>)
	<i>Cinnamomum verum</i> J.Presl	18 (<i>kulit manis</i>), 67 (<i>kayu manis</i>)
	<i>Persea americana</i> Mill.	66 (<i>alpukat</i>)
	<i>Barringtonia sarcostachys</i> (Blume) Miq.	66 (<i>sinyulung</i>)
Lecythidaceae	<i>Trigonella foenum-graecum</i> L.	27 (<i>halba</i>)
Leguminosae	<i>Aloe vera</i> (L.) Burm.f.	27 (<i>lidah buaya</i>)
Liliaceae	<i>Lindernia crustacea</i> (L.) F.Muell.	12 (<i>kukur kukur</i>), 35 (<i>rarangan</i>)
Linderniaceae	<i>Dendrophthoe pentandra</i> (L.) Miq.	41 (<i>kayu aro singgah</i>), 58 (<i>benalu mangga/kayu nepang</i>)
Loranthaceae	<i>Lawsonia inermis</i> L.	21 (<i>inei biaso</i>), 60 (<i>pacar kayu</i>)
Lythraceae	<i>Magnolia champaca</i> (L.) Baill. ex Pierre	6 (<i>jeumpa</i>)
Magnoliaceae	<i>Commersonia bartramia</i> (L.) Merr.	30 (<i>nilau nasi</i>), 52 (<i>nilau udang</i>)
Malvaceae	<i>Gossypium herbaceum</i> L.	16 (<i>kapas</i>)
	<i>Gossypium hirsutum</i> L.	27 (<i>kapuk</i>)
	<i>Gossypium</i> sp.	15 (<i>kapas</i>)
	<i>Heritiera littoralis</i> Aiton	65 (<i>nyirih</i>),
	<i>Hibiscus × archeri</i> W.Watson	12 (<i>bunga pitu lapis</i>), 14 (<i>bunga raya</i>), 17 (<i>kembang sepatu</i>)
	<i>Hibiscus mutabilis</i> L.	5 (<i>kembang semangkok</i>)
	<i>Hibiscus rosa-sinensis</i> L.	7 (<i>ema-ema</i>), 10,19, 25, 26, 28, 64 (<i>bunga raya</i>), 13 (<i>bunga raya/bungo raya</i>), 16 (<i>raya putih</i>), 23 (<i>bungo rayo putih</i>), 32 (<i>bungo rayo</i>), 33 (<i>bunga raya putih</i>), 34 (<i>kembang rayo</i>), 38 (<i>bunge raye abang</i>), 48 (<i>bungo rayo putih</i>), 51 (<i>rayo putih</i>), 52 (<i>bunga rayo/rayo putih</i>), 61, 62 (<i>kembang sepatu</i>), 65 (<i>daun raya</i>)
	<i>Hibiscus tiliaceus</i> L.	15 (<i>daun baru</i>), 60 (<i>waru</i>), 62 (<i>baruk</i>), 63 (<i>sebaru</i>), 64 (<i>maru</i>)
	<i>Malvaviscus arboreus</i> Cav.	17 (<i>bunga raya</i>)
	<i>Sida retusa</i> L.	37 (<i>sindaguri</i>)
	<i>Sida rhombifolia</i> L.	49 (<i>nagahuri besak</i>)
	<i>Sida</i> sp.	49 (<i>nagahuri kecil</i>)
	<i>Urena lobata</i> L.	13 (<i>sampi lulut</i>), 32 (<i>pulun pulun</i>), 40 (<i>pulutan</i>)
	<i>Urena</i> sp.	12 (<i>pijar keling</i>)
	<i>Maranta arundinacea</i> L.	34 (<i>sagu belando</i>)
Marantaceae	<i>Bellucia pentamera</i> Naudin	45 (<i>kayu lampam</i>)
Melastomataceae	<i>Clidemia hirta</i> (L.) D. Don	64 (<i>sengkal mate</i>), 66 (<i>kemunting buluh</i>)
ae	<i>Melastoma malabathricum</i> L.	29 (<i>kenduduk</i>)
	<i>Pternandra echinata</i> Wall.	34 (<i>marpuyan</i>)

Family	Species	Ethnic(local names)
Meliaceae	<i>Cipadessa baccifera</i> (Roth) Miq.	55 (<i>hamelukh</i>)
	<i>Lansium domesticum</i> Corr.	48 (<i>duku</i>)
	<i>Lansium parasiticum</i> (Osbeck) K.C.Sahni & Bennet	3 (<i>langsek</i>)
	<i>Xylocarpus granatum</i> J. Koenig	63 (<i>nyirih batu</i>)
	<i>Arcangelisia flava</i> (L.) Merr.	46 (<i>akar kuning</i>)
Menispermaceae	<i>Cyclea barbata</i> Miers.	31 (<i>akar sitolu</i>), 51 (<i>cincau</i>), 52 (<i>daun puput jadi /cincau</i>)
	<i>Tinospora crispa</i> (L.) Hook. f. & Thomson	34 (<i>kladiali</i>), 46 (<i>brotowali</i>), 50 (<i>protowali</i>), 52 (<i>rantau ali/brotowali</i>), 62 (<i>terong ali/brotowali</i>), 67 (<i>akar cali</i>)
Moraceae	<i>Artocarpus heterophyllus</i> Lam.	60 (<i>nangka</i>)
	<i>Ficus fistulosa</i> Reinw. ex. Bl	29 (<i>godobuk</i>)
	<i>Ficus padana</i> Burm.f.	28 (<i>semantung bulan</i>)
	<i>Ficus racemosa</i> L.	49 (<i>are</i>)
	<i>Ficus sp.</i>	28 (<i>semantung bulu/sidobuk</i>)
	<i>Ficus variegata</i> Bl.	66 (<i>kelebuk</i>)
	<i>Morus alba</i> L.	4 (<i>kerto</i>), 40 (<i>kluwi</i>)
Moringaceae	<i>Moringa oleifera</i> Lam	6 (<i>murung</i>)
	<i>Musa × paradisiaca</i> L.	2 (<i>lumbak galustabar</i>), 12 (<i>galuh tabar</i>), 27 (<i>pisang kapas</i>), 39 (<i>gabal pisang</i>), 46 (<i>pisang kepok</i>), 47, 53 (<i>pisang</i>), 49 (<i>pisang penawar</i>), 52 (<i>pisang lukau/pisang sabau/kepok</i>), 55 (<i>bung puti nipah</i>), 61 (<i>pisang rejang</i>)
Musaceae	<i>Musa sp.</i>	13 (<i>pisang stabar</i>), 63 (<i>pisang</i>)
	<i>Myristica fragrans</i> Houtt.	18 (<i>palo</i>)
Myristicaceae	<i>Eugenia sp.</i>	29 (<i>salam hutan</i>)
Myrtaceae	<i>Psidium guajava</i> L.	54 (<i>jambu klepuk</i>), 59 (<i>jambu kelumpuk</i>), 65 (<i>jambu biji</i>)
	<i>Rhodomyrtus tomentosa</i> (Aiton) Hassk.	29 (<i>kayu mayau kemunting</i>)
	<i>Syzygium aqueum</i> (Burm.f.) Alst.	48 (<i>jambu air</i>), 56 (<i>jambu hutan</i>)
	<i>Syzygium aromaticum</i> (L.) Merr. & L.M.Perry	18 (<i>cengkeh</i>)
	<i>Syzygium stapfianum</i> (King) I.M.Turner	29 (<i>daun sakat/sapu-sapu</i>), 13 (<i>bungan pukul empat</i>)
Nyctaginaceae	<i>Scorodocarpus borneensis</i> (Baill.) Becc.	29 (<i>kulim</i>)
Olacaceae	<i>Jasminum grandiflorum</i> L.	15 (<i>bunga panjang</i>)
Oleaceae	<i>Jasminum multiflorum</i> (Burm.f.) Andrews	48 (<i>bungo pekan</i>)
	<i>Jasminum sambac</i> (L.) Aiton	13 (<i>bunga panda</i>), 15 (<i>bungo pandak</i>), 16 (<i>melati putih</i>), 21 (<i>pandak</i>), 32 (<i>pandak kaki</i>), 41, 60 (<i>melati</i>), 50 (<i>bungo abang/bungo kuning</i>)
	<i>Ludwigia hyssopifolia</i> (G. Don) Exell	41 (<i>cengkehan</i>)
Onagraceae	<i>Averrhoa bilimbi</i> L.	40 (<i>belimbing wuluh</i>), 55, 58 (<i>belimbing culuk</i>)
Oxalidaceae	<i>Averrhoa carambola</i> L.	55 (<i>belimbing besi</i>)
	<i>Pandanus amaryllifolius</i> Roxb.	42 (<i>pandan wangi</i>)
Pandanaceae	<i>Pandanus sp.</i>	12 (<i>bengkuang</i>)
	<i>Antidesma platyphyllum</i> H.Mann	58 (<i>belor pulan</i>)
Phyllanthaceae	<i>Aporosa octandra</i> var. <i>malesiana</i> Schot	45 (<i>kayu pelangas</i>)
	<i>Cleistanthus monoicus</i> (Lour.) Müll.Arg.	39 (<i>kemidai</i>)
	<i>Phyllanthus acidus</i> (L.) Skeels	63 (<i>cermai</i>)
	<i>Phyllanthus niruri</i> L.	8 (<i>sidukung anak</i>)

Family	Species	Ethnic(local names)
Piperaceae	<i>Sauropus androgynus</i> (L.) Merr.	32 (<i>kedidai</i>), 58 (<i>katu</i>)
	<i>Peperomia pellucida</i> (L.) Kunth	2 (<i>tetimah</i>), 50 (<i>upui timah</i>)
	<i>Piper betle</i> L.	3 (<i>ivan</i>), 6 (<i>ranup</i>), 26 (<i>sirih</i>), 29 (<i>sirih/sirih makan</i>)
	<i>Piper nigrum</i> L.	12, 27 (<i>lada</i>), 18 (<i>lada hitam/lada putih</i>)
Poaceae	<i>Bambusa</i> sp.	18 (<i>bambu</i>)
	<i>Chrysopogon zizanioides</i> (L.) Roberty	67 (<i>akar puca</i>)
	<i>Coix lacrymajobi</i> L.	6 (<i>saka bate</i>)
	<i>Cymbopogon citratus</i> (DC.) Stapf	12 (<i>serai</i>), 54 (<i>sere</i>)
	<i>Eleusine indica</i> (L.) Gaertn.	2 (<i>palang teguh</i>), 12 (<i>padang teguh</i>), 58 (<i>pangkong</i>)
	<i>Gigantochloa apus</i> (Schult. & Schult. f.) Kurz	52 (<i>mayan</i>)
	<i>Gigantochloa heterostachya</i> Munro	23 (<i>aia sanio</i>)
	<i>Gigantochloa robusta</i> Kurz	52 (<i>bambu manyan</i>)
	<i>Gigantochloa verticillata</i> (Willd.) Munro	51 (<i>bambu dabok merah</i>)
	<i>Imperata cylindrica</i> (L.) Raeusch.	19, 34, 52 (<i>alang-alang</i>), 27 (<i>lalang</i>), 33 (<i>lalang padeang</i>), 39 (<i>ilalang</i>), 61 (<i>alang-alang/ilalang</i>)
	<i>Leersia hexandra</i> Sw.	23 (<i>rumpuik banto</i>)
	<i>Lophatherum gracile</i> Brongn.	66 (<i>rumpuik buluh</i>)
	<i>Oryza sativa</i> L.	2 (<i>beras putih</i>), 3, 5, 8, 10, 13, 45, 63 (<i>beras</i>), 19 (<i>menir beras</i>), 35 (<i>menir</i>), 52 (<i>padi ketan putih</i>)
	Polygalaceae	<i>Panicum auritum</i> J.Presl ex Nees
<i>Panicum</i> sp.		48 (<i>cekupai</i>)
<i>Saccharum officinarum</i> L.		21 (<i>tebu sirah</i>), 41 (<i>tebu seluang</i>)
<i>Saccharum</i> sp.		12 (<i>tebu gara</i>)
<i>Schizostachyum zollingeri</i> Steud.		23 (<i>aua sanio</i>)
<i>Zea mays</i> L.		17 (<i>jagong/jagung</i>)
<i>Polygala paniculata</i> L.		12 (<i>beras beras</i>)
<i>Securidaca inappendiculata</i> Hassk.		40 (<i>selareh hitam</i>)
<i>Pyrrosia piloselloides</i> (L.) M.G. Price		35 (<i>pitis-pitis</i>), 67 (<i>pitis</i>)
<i>Portulaca oleracea</i> L.		4 (<i>bebilang</i>)
Polypodiaceae		<i>Labisia pumila</i> (Blume) Mez
	<i>Colubrina asiatica</i> (L.) Brongn.	6 (<i>pria laot</i>), 8 (<i>peria laut</i>)
Primulaceae	<i>Carallia suffruticosa</i> Ridl.	55 (<i>kayu sepat</i>)
Rhizophoraceae	<i>Rosa hybrida</i> Hort.	42 (<i>mawar</i>), 48 (<i>bunga ros/bungo ros</i>)
Rosaceae	<i>Rosa</i> sp.	13 (<i>bunga mawar</i>), 16 (<i>bunga ros</i>)
	<i>Rubus alceifolius</i> Poir.	18 (<i>dubi sufi</i>)
	<i>Coffea</i> sp.	48 (<i>bungo kopi</i>)
Rubiaceae	<i>Gardenia jasminoides</i> J.Ellis	2 (<i>bulung merie</i>), 5 (<i>merol</i>), 11, 25 (<i>bunga cino</i>), 14, 33 (<i>bungo cino</i>), 21 (<i>bungo kacak piring</i>), 25, 26 (<i>bunga cino</i>), 33 (<i>bungo cino gedeang</i>), 40 (<i>cempiring</i>), 40, 42 (<i>kaca piring</i>), 50 (<i>pecuak piring</i>), 51 (-)
	<i>Hedyotis phillippensis</i>	22 (<i>langkep</i>)
	<i>Ixora coccinea</i> L.	26 (<i>kembang semangkok</i>)
	<i>Morinda citrifolia</i> L.	39, 62 (<i>mengkudu</i>)
	<i>Spermacoce alata</i> Aubl.	67 (<i>daun kenderi</i>)
	<i>Spermacoce exilis</i> (L.O.Williams) C.D Adams ex W.C. Burger & C.M. Taylor	36 (<i>jeramitaon</i>)
	<i>Uncaria gambir</i> (Hunter) Roxb.	24 (<i>kekacu</i>)
	<i>Citrus aurantiifolia</i> (Christm.) Swingle	16 (<i>jeruk nipis/limo adulo</i>), 20, 36, 40, 42, 54 (<i>jeruk nipis</i>), 41 (<i>jeruk</i>), 44 (<i>jeruk nipis/kayu singgah</i>), 53 (<i>limau talloy</i>)
Rutaceae	<i>Citrus hystrix</i> DC.	8 (<i>rhimo mungkok</i>), 17 (<i>jeruk purut</i>)
	<i>Citrus</i> sp.	18 (<i>unte sunde</i>)
	<i>Glycosmis pentaphylla</i> (Retz.) DC.	54 (<i>kayu latun</i>)

Family	Species	Ethnic(local names)
	<i>Ruta angustifolia</i> Pers.	32 (<i>inggu</i>)
	<i>Flacourtia rukam</i> Zoll & Mor	29 (<i>ulkam</i>)
Salicaceae	<i>Santalum album</i> L.	58 (<i>cedana</i>)
Santalaceae	<i>Allophylus cobbe</i> (L.) Raeusch.	52 (<i>cenano</i>)
Sapindaceae	<i>Cardiospermum grandiflorum</i> Sw.	52 (<i>sekelam</i>)
	<i>Cardiospermum halicacabum</i> L.	49 (<i>kengkelam</i>)
	<i>Lepisanthes amoena</i> (Hassk) Leenh.	30 (<i>belimbing hutan</i>)
	<i>Nephelium lappaceum</i> L.	10, 11, 15, 16, 31, 32, 34, 43, 45, 56 (<i>rambutan</i>)
	<i>Sargassum muticum</i>	15 (<i>jariamun lawik/jariango lawik</i>)
Sargassaceae	<i>Lygodium flexuosum</i> (L.) Sw.	27 (<i>ribu-ribu</i>)
Schizaeaceae	<i>Brucea javanica</i> (L.) Merr.	52 (<i>melur kayu</i>)
Simaroubaceae	<i>Eurycoma longifolia</i> Jack	10, 17, 29, 48, 50, 65, 67 (<i>pasak bumi</i>), 28 (<i>petalo bumi</i>), 61 (<i>kayu pulih</i>)
	<i>Smilax leucophylla</i> Blume	29 (<i>akar ipuh</i>)
Smilacaceae	<i>Capsicum annum</i> L.	3 (<i>sipilik itok-itok</i>)
Solanaceae	<i>Capsicum frutescens</i> L.	4 (<i>caplak</i>)
	<i>Datura metel</i> L.	12 (<i>terung pungar</i>)
	<i>Lycopersicon esculentum</i> Mill.	60 (<i>rampai</i>)
	<i>Nicotiana tabacum</i> L.	18 (<i>tembakau</i>)
	<i>Physalis angulata</i> L.	29 (<i>daun ciplukan</i>), 39 (<i>kertupan</i>), 46 (<i>seletup</i>), 52 (<i>celetup</i>), 61 (<i>lelepok</i>)
	<i>Physalis minima</i> L.	27 (<i>siletup</i>)
	<i>Solanum khasianum</i> C.B. Clarke	18 (<i>tabang leto/ terong duri</i>)
	<i>Solanum lycopersicum</i> Lam.	38 (<i>cung diro lamo</i>), 57 (<i>mandira</i>), 58 (<i>tomat</i>)
	<i>Solanum rudepannum</i> Dunal	13 (<i>rimbang</i>)
	<i>Sphagnum</i> sp.	29 (<i>bambu kuning</i>)
Sphagnaceae	<i>Strelitzia</i> sp.	34 (<i>pisang bali</i>)
Strelitziaceae	<i>Styrax benzoin</i> Dryand.	15 (<i>kemenyan</i>), 15 (<i>menyan putih</i>), 16 (<i>kemenyan</i>), 51 (<i>menyan</i>),
Styracaceae	<i>Styrax tonkinensis</i> (Pierre) Craib ex Hartwich	6 (<i>keumeunyan puteh</i>)
	<i>Phaleria macrocarpa</i> (Scheff.) Boerl.	16 (<i>daun dewa</i>)
Thymelaeaceae	<i>Wikstroemia androsaemifolia</i> Decne.	61 (<i>kebentak</i>)
	<i>Dendrocnide sinuata</i> (Blume) Chew	12 (<i>lateng ndiru</i>)
Urticaceae	<i>Dendrocnide stimulans</i> (L.f.) Chew	12 (<i>lateng nderasih</i>)
	<i>Elatostema</i> sp.	12 (<i>stekap</i>)
	<i>Pilea microphylla</i> (L.) Liebm.	16 (<i>lagene batu</i>)
	<i>Poikilospermum suaveolens</i> (Blume) Merr.	16 (<i>lundang</i>), 23 (<i>aka lundang</i>), 24 (<i>entawan</i>)
Verbenaceae	<i>Callicarpa candicans</i> (Burm.f.) Hochr.	61 (<i>kelingkak</i>)
	<i>Clerodendrum chinense</i> (Osbeck) Mabb.	8 (<i>cipako baru</i>)
	<i>Clerodendrum paniculatum</i> L.	30 (<i>panggil-panggil</i>)
	<i>Lantana camara</i> L.	18 (<i>singgolom bobi</i>), 48 (<i>cemete</i>), 60 (<i>ketayam</i>)
	<i>Peronema canescens</i> Jack	35, 47, 52, 54 (<i>sungkai</i>) (<i>sungkai</i>), 48 (<i>sukai</i>), 50 (<i>sukei/sungkai</i>)
	<i>Vitex pinnata</i> L.	29 (<i>loban</i>), 54 (<i>kayu laban</i>)
	<i>Vitex trifolia</i> L.	7 (<i>lagundi</i>), 8 (<i>katibunuh</i>), 19 (<i>sihala gundi</i>)
Violaceae	<i>Viola hastata</i> Michx.	12 (<i>calung calung</i>)
	<i>Cayratia trifolia</i> (L.) Domin	48, 64 (<i>lakum</i>)
Vitaceae	<i>Cissus hastata</i> Miq.	27 (<i>asam riang</i>)
	<i>Leea guineensis</i> G. Don	49 (<i>memaye abang</i>)
	<i>Alpinia caerulea</i> (R. Br.) Benth.	35 (<i>katimbang</i>)
Zingiberaceae	<i>Alpinia galanga</i> (L.) Willd.	54 (<i>lawwas</i>), 59 (<i>lawas</i>),
	<i>Curcuma domestica</i> Val.	13, 14, 28, 33, 34, 36, 37, 40, 62, 63 (<i>kunyit</i>), , 18 (<i>unik biasa</i>), 29 (<i>kapek kunyit</i>)

Family	Species	Ethnic(local names)
	<i>Curcuma longa</i> L.	3 (<i>odel</i>), 12 (<i>kuning gajah gersing</i>), 17 (<i>koning</i>), 26, 39, 54 (<i>kunyit</i>)
	<i>Curcuma sp.</i>	18 (<i>unik tindosan</i>)
	<i>Curcuma zanthorrhiza</i> Roxb.	8 (<i>kuning gajah</i>)
	<i>Etlintera elatior</i> (Jack) R.M. sm.	53 (<i>jabung</i>), 58, 60 (<i>kutimbang</i>)
	<i>Etlintera sp.</i>	29 (<i>kayu tombang</i>), 52 (<i>puar timbang</i>)
	<i>Globba fecunda</i> A.Takano & H.Okada	22 (<i>patilungkup</i>)
	<i>Hedychium maximum</i> Roscoe	15 (<i>bunga ranggasoli</i>)
	<i>Kaempferia galanga</i> L.	1 (<i>kencur</i>), 2 (<i>kecior</i>), 3 (<i>kencur/singkelu</i>), 12 (<i>kaciwer</i>), 18 (<i>asior</i>), 39 (<i>cekur</i>)
	<i>Scaphochlamys sp.</i>	22 (<i>kiniu birut</i>)
	<i>Zingiber amaricans</i> Bl.	34 (<i>jangau banglai</i>)
	<i>Zingiber montanum</i> (J.Koenig) Link ex A.Dietr.	3 (<i>kuni bonglai</i>), 39 (<i>bangle</i>), 42 (<i>bunglai</i>)
	<i>Zingiber officinale</i> Roscoe	18 (<i>sipodeh</i>), 26 (<i>bonglai putih</i>), 39, 45, 67 (<i>jahe</i>)
	<i>Zingiber purpureum</i> Roscoe	1 (<i>bengle/mulee</i>), 18 (<i>unik bulnge</i>)
	<i>Zingiber zerumbet</i> (L.) Roscoe ex Sm.	18, 19 (<i>lempuyang</i>), 29 (<i>daun tangkal hitam</i>)

Table 1. List of species of medicinal plants by ethnic users.

Note: 1: Aceh; 2: Alas; 3: Devayan; 4: Gayo; 5: Gayo Serbajadi; 6: Kluet; 7: Sigulai; 8: Singkil; 9: Tamiang; 10: Angkola; 11: Barus; 12: Karo; 13: Mandailing; 14: Melayu; 15: Natal; 16: Nias; 17: Pakpak; 18: Siladang; 19: Simalungun; 20: Toba; 21: Ulu; 22: Mentawai; 23: Minangkabau; 24: Akit; 25: Bonai; 26: Duano Laut; 27: Hutan; 28: Petalangan; 29: Sakai; 30: Talang Mamak; 31: Anak Dalam; 32: Bhatin; 33: Kerinci; 34: Pindah; 35: Daya; 36: Kikim; 37: Komereng; 38: Lintang; 39: Meranjat; 40: Musi; 41: Ogan; 42: Pegagan; 43: Rawas; 44: Semendo; 45: Teloko; 46: Enggano; 47: Lebak; 48: Muko-Muko; 49: Pasemah; 50: Pekal; 51: Rejang; 52: Serawai; 53: Abung Kota Bumi; 54: Abung Seputih; 55: Lampung Pesisir; 56: Mesuji; 57: Peminggir; 58: Pepadun; 59: Pubian; 60: Sungkai Bunga Mayang; 61: Lom; 62: Sawang; 63: Laut; 64: Lingga; 65: Mantang; 66: Melayu Lingga; 67: Melayu Natuna

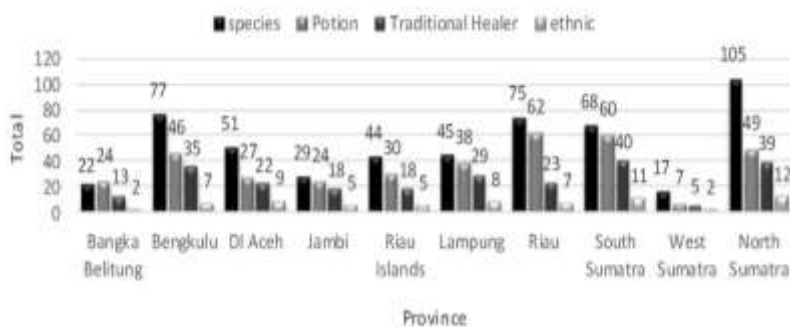


Figure 2. Number of ethnicities, traditional healers and medicinal plant species by province

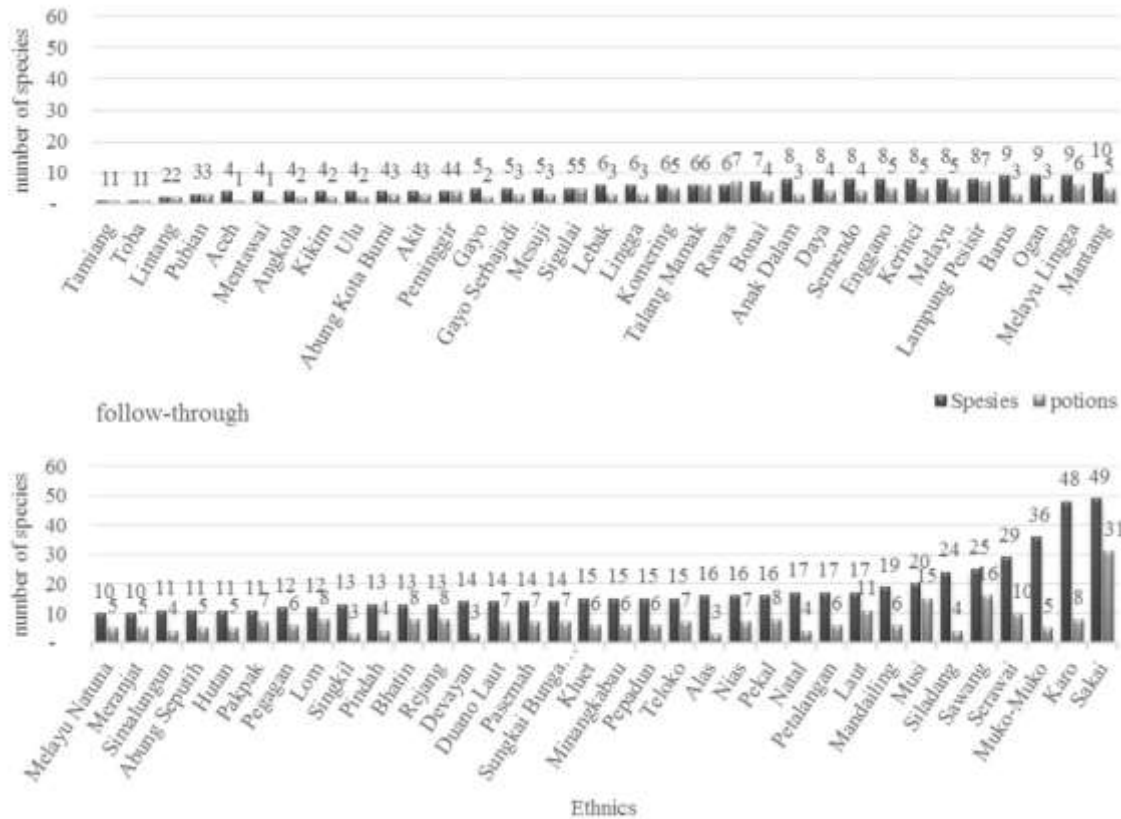


Figure 3. Number of fever potions and medicinal plants used by each ethnic group

The number of medicinal plant species by province is shown in figure 2. North Sumatra is a province with the highest number of medicinal plants, where 105 medicinal plants species used in 49 fever potions from 26 traditional healers in 12 ethnics. This shows that North Sumatra has a higher knowledge of local wisdom compared to other provinces, supported by the number of ethnic groups in it. Meanwhile, the less number of species for fever potions is in West Sumatra, which is 17 species used in 7 fever potions by 5 traditional healers from 2 ethnics.

The number of potions and medicinal plant species based on ethnicities (Figure 3), shows that the medicinal plant species usage distribution varies among ethnic. The Sakai ethnics is the medicinal plant's most user (49 species) with a total of 31 potions of fever, while Tamiang and Toba ethnic has the least number of medicinal plant species used and potion of fever, one species and potion each. It's shows that Sakai ethnic has high dynamics and broad knowledge in managing local wisdom and its natural resources compared to other ethnics in Sumatra.

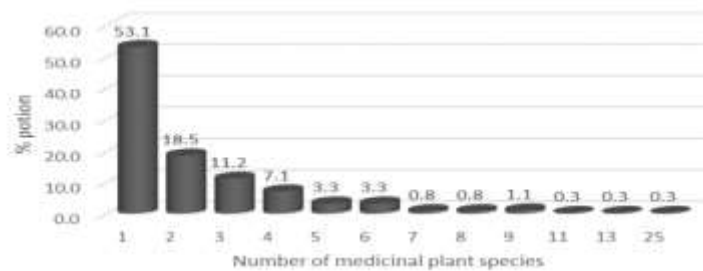


Figure 4. Number of medicinal plants in a potion

Potion of fever usually uses various species of medicinal plants as a constituent and numbers of medicinal plants used in a potion showed in Figure 4. Most of the fever potions contain one species of medicinal plant as a

single potion (53.1%). Compound fever potions of ethnics in Sumatra are using between 2 to 25 medicinal plant species. The compound fever potion with the most

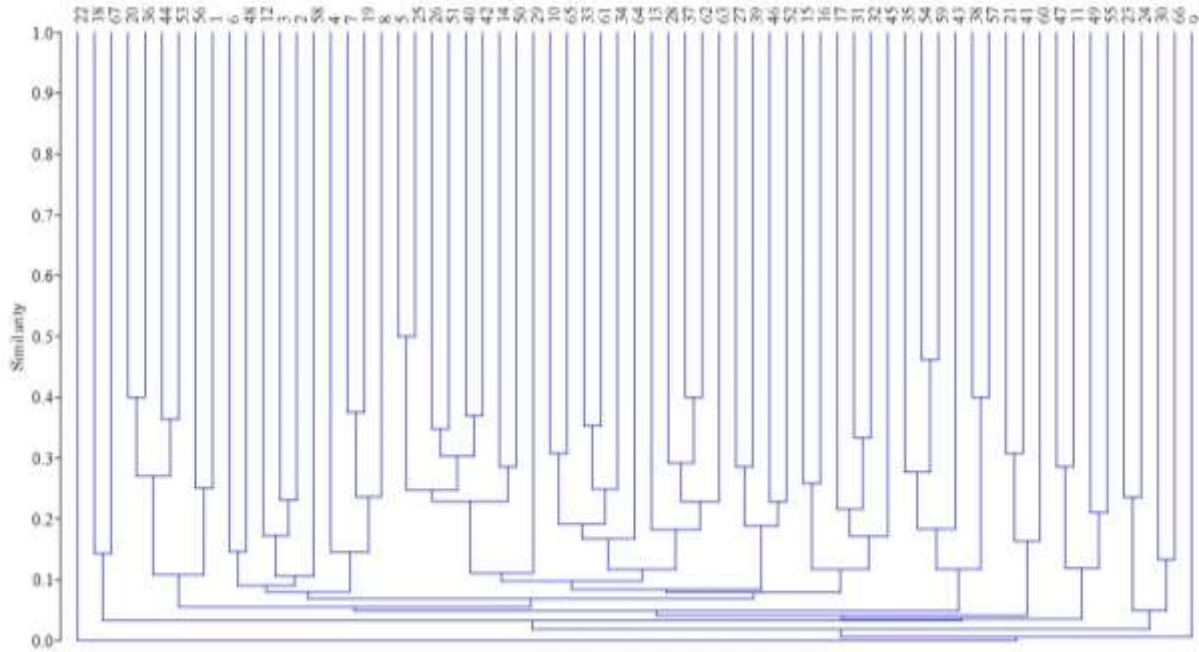


Figure 7. Dendrogram of inter-ethnic similarity levels in Sumatra with the Bray-curtis similarity index based on the use of medicinal plants.

Note: 1: Aceh; 2: Alas; 3: Devayan; 4: Gayo; 5: Gayo Serbajadi; 6: Kluet; 7: Sigulai; 8: Singkil; 9: Tamiang; 10: Angkola; 11: Barus; 12: Karo; 13: Mandailing; 14: Melayu; 15: Natal; 16: Nias; 17: Pakpak; 18: Siladang; 19: Simalungun; 20: Toba; 21: Ulu; 22: Mentawai; 23: Minangkabau; 24: Akit; 25: Bonai; 26: Duano Laut; 27: Hutan; 28: Petalangan; 29: Sakai; 30: Talang Mamak; 31: Anak Dalam; 32: Bhatin; 33: Kerinci; 34: Pindah; 35: Daya; 36: Kikim; 37: Komering; 38: Lintang; 39: Meranjat; 40: Musi; 41: Ogan; 42: Pegagan; 43: Rawas; 44: Semendo; 45: Teloko; 46: Enggano; 47: Lebak; 48: Muko-Muko; 49: Pasemah; 50: Pekal; 51: Rejang; 52: Serawai; 53: Abung Kota Bumi; 54: Abung Seputih; 55: Lampung Pesisir; 56: Mesuji; 57: Peminggir; 58: Pepadun; 59: Pubian; 60: Sungkai Bunga Mayang; 61: Lom; 62: Sawang; 63: Laut; 64: Lingga; 65: Mantang; 66: Melayu Lingga; 67: Melayu Natuna

Based on the dendrogram, Mentawai ethnicity is quite interesting because of the zero similarity index value. This means that it is not similar to any ethnics. This is clearly seen in the NMDS scatter-plot ordinances (Figure 8). These conditions indicate that Mentawai ethnic uses

medicinal plants for fever that are completely different compared to other ethnics. They use four species of medicinal plants that are not found in other ethnics, namely: *Dracaena maingayi*, *Globba fecunda*, *Hedyotis phillipensis* and *Scaphochlamys* sp. (see Table 1).

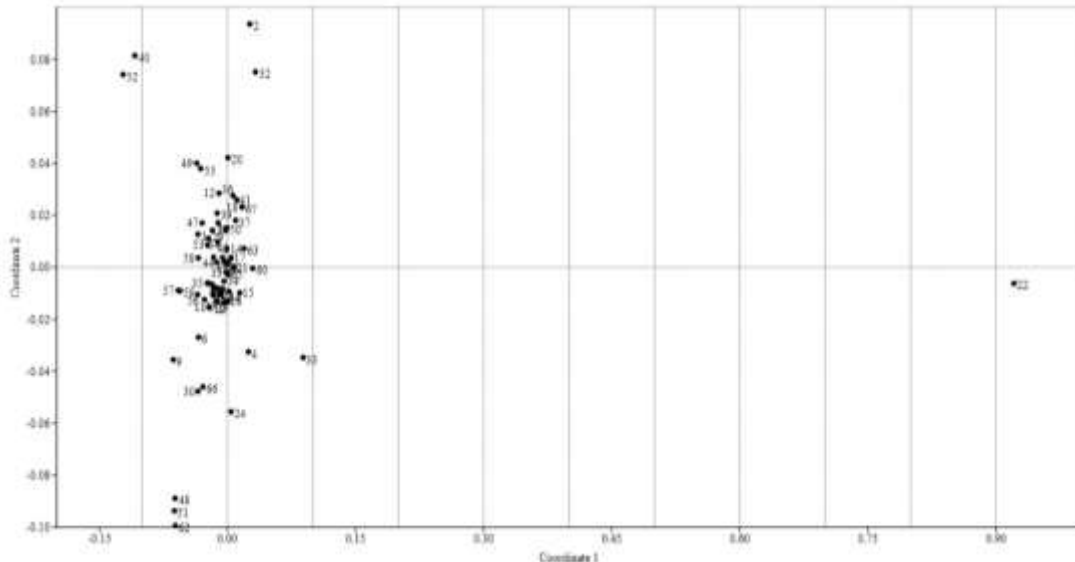


Figure 8. Scatterplot NMDS ordination in Bray-curtis similarity index between ethnic groups.

Note: 1: Aceh; 2: Alas; 3: Devayan; 4: Gayo; 5: Gayo Serbajadi; 6: Kluet; 7: Sigulai; 8: Singkil; 9: Tamiang; 10: Angkola; 11: Barus; 12: Karo; 13: Mandailing; 14: Melayu; 15: Natal; 16: Nias; 17: Pakpak; 18: Siladang; 19: Simalungun; 20: Toba; 21: Ulu; 22: Mentawai; 23: Minangkabau; 24: Akit; 25: Bonai; 26: Duano Laut; 27: Hutani; 28: Petalangan; 29: Sakai; 30: Talang Mamak; 31: Anak Dalam; 32: Bhatin; 33: Kerinci; 34: Pindah; 35: Daya; 36: Kikim; 37: Komering; 38: Lintang; 39: Meranjat; 40: Musi; 41: Ogan; 42: Pegagan; 43: Rawas; 44: Semendo; 45: Teloko; 46: Enggano; 47: Lebak; 48: Muko-Muko; 49: Pasemah; 50: Pekal; 51: Rejang; 52: Serawai; 53: Abung Kota Bumi; 54: Abung Seputih; 55: Lampung Pesisir; 56: Mesuji; 57: Peminggir; 58: Pepadun; 59: Pubian; 60: Sungkai Bunga Mayang; 61: Lom; 62: Sawang; 63: Laut; 64: Lingga; 65: Mantang; 66: Melayu Lingga; 67: Melayu Natuna

Discussion

Hibiscus rosa-sinensis is a plant that is most widely used by traditional healers. This indicates that these plants are easily found in Sumatra. The distribution of this plant is quite extensive and can be found in all parts of Indonesia. In addition, it is indicated that some traditional healers in Sumatra have the same comprehension that empirically *H. rosa-sinensis* is useful to treat fever.

Mentawai ethnic live in the Mentawai Islands which consists of four large islands namely Siberut, Sipora, North Pagai, South Pagai, and several small islands. Siberut is the largest island with an area of 400,03 ha (12). *Dracaena maingayi* (*Asparagaceae*) and *Hedyotis philippinensis* (*Rubiaceae*) are shrub plants that are found growing on the island of Siberut. *D. Maingayi* is a Peninsular Malaysian endemic plant that grows in mangrove forest and coastal forest types, while *H. philippinensis*, which is an indigenous Malaysian plant, grows in valley forest habitat types (13). *Globba fecunda* (*Zingiberaceae*) is one type of *Globba* found in Sumatra. *Globba* sp. often found in forest areas in the Sumatra valley (14–16). *Scaphochlamys* sp. is an endemic plant of Sumatra and Malaysia (14,17).

Mentawai ethnic has different medical knowledge from other ethnics in Sumatra (figure 8). Siberut Island, which is occupied by Mentawai ethnic, has a diversity of plants that is quite different from other islands. The Siberut island ecosystem consists of *Dipterocarpaceae* forest, mixed lowland forest, freshwater swamp forest, coastal forest, mangrove forest, and secondary forest (18). In the treatment method for ethnic Mentawai, an elder act as a traditional healer as *Sekerei*. *Sekerei* is only given the authority to cure diseases and help lead traditional ceremonies if rimata (ethnic leaders) are absent. *Sekerei* holds *Arat Sabulungan's* belief in doing the treatment. *Arat Sabulungan* is a belief about the existence of a relationship between humans and the supernatural. The relationship is bridged by a *Sekerei*. For the Mentawai ethnic, the surrounding environment, especially the diversity of plants, is an important part of the existence of the *Sekerei*. *Sekerei* implements traditional medicine with its ability to process medicinal raw materials taken from various plants found in the Mentawai forest (19,20).

Treatment of fever by traditional healers from all over Sumatra based on the use of medicinal plants shows a low level of similarity. This shows that traditional healer

has specific local wisdom in their respective regions by fully utilizing the natural resources around them.

Conclusion

The use of medicinal plants to treat fever in each ethnic group is still based on hereditary experience. Low similarity of plants that is used between ethnic groups, caused by barriers such as geographical and cultural. The distribution and availability of plants that can be used as medicine in each place are also important influencing factors.

The differences in medicinal plants usage among the ethnic groups enriches the diversity of knowledge and local wisdom in treating fever. In prospect that the diversity of empirical knowledge from ethnic groups throughout Sumatra could be developed in order to advancing the world of health.

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