

Medicinal Plants and their Use by the Hill Tribes in Northern Thailand

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1. Introduction

Many hill tribes of northern Thailand cultivate poppies as their main crop to earn cash by selling opium. The opium is obtained from the latex collected from immature poppy capsules and is smuggled out to obtain high prices in countries around the world. This narcotic gives rise to serious world-wide social problems, and the Thai government has decided to take firm measures to suppress its production. Presently, the Thai armed forces are monitoring poppy cultivation from helicopters and are making efforts to eradicate the smuggling of opium by setting up checkpoints. At the same time, cultivation of other profitable cash crops is being promoted.

As a part of an academic exchange agreement between Kinki University and Chiang Mai University signed in April 1989, the Faculties of Agriculture and Pharmacy of both Universities and the Department of Pharmacology at Kinki University School of Medicine started a joint research program to help in the elimination of this narcotic.

Areas of endeavor are :

- 1) Studies of the cultivation of cash crops, especially medicinal plants with high commercial value, as alternatives to poppies.
- 2) Extraction of effective compounds by pharmacological methods from several species of Thai medicinal plants with high pharmacological activity.
- 3) Survey of folk medicinal plants used by hill tribes in Thailand.
- 4) Studies of the cultivation of mushrooms with high market value in Thailand.

The medicinal plants mentioned above in item 3 are not in general use in Thailand but are traditionally used as folk medicine even now by the hill tribes. If the survey finds plants proven to have a pharmacological effect and then developed for general use, the plants will contribute to the health of mankind. In addition, if these useful medicinal plants are successfully cultivated and used by many people, they will promote the economic development of the hill tribes and the Thai people in general.

2. Method of Survey

The hill tribes, located in mountainous areas of the western and southern part of China and

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northern part of Myanmar, Laos, and Thailand, make their livelihood by breeding animals and cultivating crops by slash-and-burn farming. When the area becomes unproductive, they move to another mountain and repeat the same method. They have a total population of about 560,000, divided into 19 tribes. The six major tribes among these are the Yao, Akha, Karen, Hmong, Lahu, and Khin. Each tribe has its own culture and traditions, especially in the extensive use of plants as medicines. Traditional medicine are still being used, but have been replaced by more convenient and cheaper modern medicines. A survey of the use of these medicinal plants is needed before their use is forgotten.

A survey was conducted eight times in four tribes living in eight villages in the mountainous areas of the provinces of Chiang Rai and Chiang Mai in northern Thailand (Fig. 1), from December 1990 to November 1992. Researchers from the Faculties of Pharmacy of both universities were the main survey members. In the villages, as a rule, nobody has been trained in modern medicine, but one or more persons among the inhabitants are semispecialists (village herbalist) in the use of folk medicines used by that tribe. When villagers become ill, they immediately seek the advice of a village herbalist. The patients trust the village herbalists as consultants to preserve or restore health, and follow his or her prescriptions. We interviewed each local herbalist listed in Table 1 in the eight villages about folk medicine, and gained information concerning medicinal plants, method of their use, indicative symptoms, etc. In these interviews

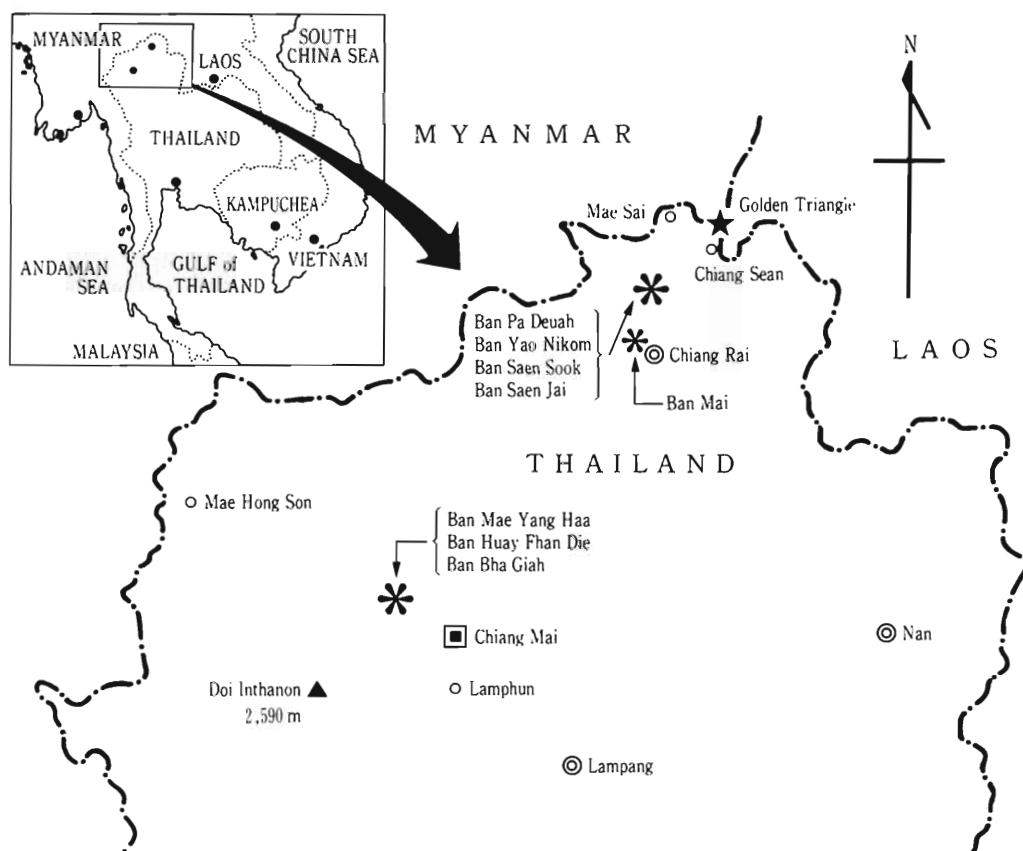


Fig. 1. Map showing the places surveyed in northern Thailand

Table 1. Villages (tribes) and names of interviewers providing information

Village [tribe (abbrev.)]	Names of informant (Semispecialist)	Age, years
Ban Pa Deuah	Mrs. Fahm-Din	76
[Yao tribe (Y-1)]	Mr. Bau-Joy	31
	Mr. Sahn-Guay	43
Ban Yao Nikom	Mrs. Maelin	71
[Yao tribe (Y-2)]	Mrs. Fham-Joy	66
Ban Saen Sook	Mr. Aha-Yha	55
[Akha tribe (A-1)]	Mrs. Pai-Raw	35
	Mrs. Aha-Po	67
Ban Saen Jai	Mrs. Aha-Po	67
[Akha tribe (A-2)]		
Ban Mai	Mr. Ju Ju-Bah	30
[Akha tribe (A-3)]		
Ban Mae Yang Haa	Mr. Nu-Nah Sutha	78<
[Karen tribe (K-1)]		
Ban Huay Phan Die	Mr. Nu-Nah Sutha	78<
[Karen tribe (K-2)]		
Ban Bha Giah	Mrs. Maw Sae-Jow	60<
[Hmong tribe (M-1)]	Mr. Chai-Ju Sae-Wahng	73

we had many difficulties in communication even with an interpreter, especially concerning plant names and medical words, since the informants speak only their own tribal dialect. We were able to identify most plant names by examination of plant specimens, but for the folk medical terms, we were forced to guess at times at the explanations.

The names of plant species are arranged in Table 2 according to Engler's system, together by their folk medical use, part used, methode of preparation and administration, names of the hill tribes that use them, and the Japanese genus names (if any).

Table 2 Botanical names and uses of medicinal plants known to hill tribes

*¹ see Table 3 *² W.: whole plant; R.: root; Rh.: rhizome; S.: stem; L.: leaves; Fl.: flowers; Fr.: fruit; Se.: seed; B.: bark; La.: latex (sap); Br.: branches. *³ see Table 1

Botanical name	Used for* ¹	Part* ² used	Preparation	Hill* ³ tribe	Remarks
SELAGINELLACEAE (イワヒバ科)					
1 <i>Selaginella minutifolia</i> SPR. (イワヒバ属)	Rc, Ap (pharyngalgia)	W	Boil and drink	Y 1	
2 <i>S. repanda</i> SPR.	G (aid to bring about pregnancy)	L	Boil and drink	H 1	
EQUISETACEAE (トクサ科)					
3 <i>Equisetum debile</i> ROXB. ex VANCH. (トクサ属)	H	L, S	Boil and drink	H 1	
SCHIZAEACEAE (フサシダ科)					
4 <i>Lygodium flexuosum</i> SW. (カニクサ属)	Aa (stiffening) Aa (stiffening)	L, S L, S, R	Boil and drink	Y 1 H 1	
ASPIDACEAE (オシダ科)					
5 <i>Tectaria fauriei</i> TAG. (ゴモチナナバケシダ)	Sk	L	Soak in water, roast, and rub on skin	Y 1	

Table 2 (Continued)

Botanical name	Used for ^{*1}	Part ^{*2} used	Preparation	Hill ^{*3} tribe	Remarks
PTERIDACEAE (イノモトソウ科)					
6 <i>Adiantum philippinense</i> LINN. (クジャクシダ属)	Aa, P (stiffening, contusion)	L	Crush and cover the contusion	H-1	
GNETACEAE (グネツム科)					
7 <i>Gnetum montanum</i> MGF. (グネツム)	C (cardiotonic)	R	Crush and hold the affected area with bandage	A-1	
ULMACEAE (ニレ科)					
8 <i>Trema orientalis</i> DL. (ウラジロエノキ)	G (dysmenorrhea)	R	Boil and drink	K-2	
MORACEAE (クワ科)					
9 <i>Artocarpus gomeziana</i> WALL. (タンパン)	Ud, Uc	S	Boil and drink	Y-1	
10 <i>Ficus laevis</i> var. <i>laevis</i> (イチジク属)	Mt	L, S	Boil with germinated rice and drink	Y-1	
11 <i>F. pubigera</i> var. <i>bubigera</i>	P (convulsions, respiratory stimulant)	L, R	Boil and drink	Y-1	
12 <i>Morus macroura</i> MIQ. (クワ属)	Ai (burns)	La	Apply on burned area	H-1	
PROTEACEAE (ヤマモガシ科)					
13 <i>Heliconia terminans</i> SLEUM. (ヤマモガシ属)	H, D (nausea)	B, R	Powder and eat	K-1	Mix with some other plants (<i>Teak</i> , <i>Cassia</i> , <i>Coix</i>) for treatment of sexually transmitted disease
LORANTHACEAE (ヤドリギ科)					
14 <i>Dendrophthoe pentandra</i> MIQ.	Aa (arthralgia)	L, S	Crush (L) and apply on the sore area or boil (S) and drink	A-2	
POLYGONACEAE (タデ科)					
15 <i>Fagopyrum cymosum</i> MEISN. (シヤクチリソバ)	Sk (protective)	L	Crush, wrap with banana (L), roast before covering on wound	A-3	
16 <i>Polygonum chinense</i> LINN. (ツルソバ)	Ai (hemorrhoids) Ai (stomatitis)	— Fr, L	Apply to hemorrhoid	A-1 Y-1	
17 <i>P. hydropiper</i> LINN. (ヤナギタデ)	G (puerperium)	—	—	Y-2	
PORTULACACEAE (スベリヒユ科)					
18 <i>Talinum triangulare</i> WILLD. (ハゼナ)	Mt Mt (weakness)	R L	Macerate with alcohol Roast (L) with egg and eat	K-1 H-1	
BASELLACEAE (ツルムラサキ科)					
19 <i>Basella alba</i> LINN. (シンツルムラサキ)	G (puerperium)	L, S	—	Y-2	Mix with six other plants. Cultivated
AMARANTHACEAE (ヒユ科)					
20 <i>Alternanthera ficoidea</i> var. <i>betzickiana</i> BACK.	Mt	—	—	Y-2	One of seven plants used as tonic medicine. Cultivated
21 <i>Celosia argentea</i> LINN. (ノグゼイトウ)	I (tuberculosis)	R	—	A-1	Cultivated
22 <i>Gomphrena globosa</i> LINN. (センニチコウ)	D (dysentery, stomachache)	R	—	A-1	Cultivated, white-flowered variety
CACTACEAE (サボテン科)					
23 <i>Opuntia vulgaris</i> MILL. (タンシウチウ)	Ud (edema)	L, S	Boil and use solution for bathing	K-1	
ANNONACEAE (パンレイシ科)					
24 <i>Annonia dulcis</i> SINCL.	Mt (weakness)	S	Boil and drink	Y-1	
25 <i>Milusa thorelii</i> FIN. & GAGNEP.	Ai (tendinitis)	R	Boil and eat, cover the area mixture with plant	K-1	

Table 2 (Continued)

Botanical name	Used for ^{*1}	Part ^{*2} used	Preparation	Hill ^{*3} tribe	Remarks
SCHISANDRACEAE (マツブサ科)					
26 <i>Kadsura heteroclita</i> CRAIB (サネカズラ属)	Ai (fracture)	S	Boil and drink	A-1	
LAURACEAE (クスノキ科)					
27 <i>Cinnamomum iners</i> REINW. ex BL. (イヌニッケイ)	O (warm bath)	L, S	Boil	Y-1	
28 <i>Litsea glutinosa</i> C.B. ROB. (タンカテック)	Ai (fracture, sprain)	L, S	L: Crush, cover wound S: Boil and drink	A-2	
29 <i>Litsea</i> sp. (ハマビワ属)	Ai (bruise)	L, S	Dry, crush, and put on wound	A-2	
30 <i>Phoebe lanceolata</i> NEES.	Ai (external injury)	S, R	Boil and drink or use solution to clean wound	H-1	
	Ai (injury)	S, B, R	Dry, and crush with No. 136, put on wound	K-1	For deep wound, put dried powder in water and drink
BERBERIDACEAE (メギ科)					
31 <i>Mahonia nepalensis</i> DC. (ネパールヒイラギナンテン)	Ap, D, Ud (jaundice, edema)	B, R	Boil and drink, solution, use for bathing	K-2	
MENISPERMACEAE (ツヅラフジ科)					
32 <i>Cyclocle atjehensis</i> FORMAN (ミヤコジマツヅラフジ属)	Sk (itching, pimples)	L	Roast the (L), and rub on skin	Y-2	
33 <i>C. varians</i> CRAIB	D (abdominal pain)	L	Crush (L) in water and drink	A-1	
	Mg, Ai (diabetes, swelling)	R, W	Dry and crush	K-1	
34 <i>Tinomiscium petiolare</i> HK. f. & THOMS.	Ai (tendinitis)	L, S	Crush (L) and cover wound; boil (S) and drink	A-1	
PIPERACEAE (コショウ科)					
35 <i>Piper argyrophyllum</i> MIQ. (コショウ属)	Ai (fracture)	W	Crush, heat, and wrap around fracture	Y-1	
	Re, I (cough, tuberculosis)	W		A-1	
	C (arrhythmia)	L, S, R	Boil and drink	Y-1	
36 <i>P. betle</i> LINN. (キンマ)	Aa (otalgia)	L	Crush before use	A-1	Cultivated
37 <i>P. hamiltonii</i> C. DC.	H	R	Boil and drink	H-1	
CHLORANTHACEAE (センリョウ科)					
38 <i>Chloranthus erectus</i> VERD. (センリョウ属)	Ai (congestion)	R	Boil and drink	H-1	
OCHNACEAE (オウナ科)					
39 <i>Ochna integerrima</i> MERR.	Mt (weakness)	R	Boil and drink	K-1	
THEACEAE (ツバキ科)					
40 <i>Schima wallichii</i> KORTH. (メダンガタル)	D (diarrhea)	L	Boil and drink	A-2	Mix with No. 103
CAPPARIDACEAE (フウチョウソウ科)					
41 <i>Cratogeomys murata</i> BUCH-HAM (ビルマギョボク)	Sk (pimples, pustules)	L	Crush, and roast, then cover wound	A-1	
ROSACEAE (バラ科)					
42 <i>Rubus alceifolius</i> POIR. (キイチゴ属)	H	R	Boil and drink	H-1	Mix with Nos. 104, 119
43 <i>R. ellipticus</i> f. <i>obcordatus</i> FRANCH.	G (puerperium)	R	Boil and drink	H-1	Mix with Nos. 104, 119
	O	R	Boil	H-1	
CONNARACEAE (マメモドキ科)					
44 <i>Connarus sonidecandrus</i> JACK	I (tuberculosis)	S	Boil and drink	A-1	
LEGUMINOSAE (マメ科)					
45 <i>Archidendron clypearia</i> var. <i>clypearia</i> NIELSEN	Aa (ophthalmalgia)	L	Boil and use solution to wash eyes	H-1	

Table 2 (continued)

Botanical name	Used for ^{*1}	Part ^{**2} used	Preparation	Hill ^{**3} tribe	Remarks
46 <i>Bauhinia ornata</i> var. <i>kerrii</i> K. & S.S. LAR. (ハカマカズラ属)	Ai (hemorrhoids)	S, R	Suck or boil, and drink	Y-1	
47 <i>Crotalaria nallida</i> AIT. (タヌキマメ属)	I (tuberculosis)	R	Boil and drink	A-2	
48 <i>Desmodium oblongum</i> WALL. ex BTH. (ヌスビトハギ属)	Ap	R	Boil and drink	K-1	
49 <i>Flemingia ferruginea</i> var. <i>ferruginea</i>	G (puerperium)	R	Boil and eat with other plants	H-1	
50 <i>F. sootepensis</i> CRAIB	Mt D (diarrhea, malnutrition in children)	R S, R	Boil and eat Boil and drink	Y-2 K-1	Take every 1-2 years
51 <i>Milletia verruculosa</i> GAGNEP. (ナツフシ属)	Ap, P (discomfort) Uc, Ap, P (discomfort)	— R	Boil and eat Boil and eat	Y-2 Y-2	Take every 1-2 years
52 <i>Phyllacium majus</i> COLL. & HEMSL. EUPHORBIACEAE (トウダイグサ科)	D (appetizer)	L, S	Boil and drink	H-1	
53 <i>Croton oblongifolius</i> ROXB. (ハズ属)	Ai (body swelling after recovery from fever)	L	Boil and breathe vapor	A-2	
54 <i>Glochidion sphaerospermum</i> KURZ (カンコノキ属)	D (stomatitis)	Br	Crush, chew, or suck	H-1	
55 <i>Mallotus philippinensis</i> var. <i>philippinensis</i> (クスノハガシワ)	G (lactation)	L, S, R	Boil and drink	Y-1	
56 <i>Mallotus</i> sp. (アカメガシワ属)	Ap, Sk (abscess)	L, R	L: Roast, wrap abscess R: Boil (1 inch), drink 2-3 times	Y-1	
57 <i>Mallotus</i> sp.	Sk (pimples, eruptions)	L	Powder dry (L) and apply on wound	A-1	
58 <i>Pedilanthus tithymaloides</i> subsp. <i>tithymaloides</i> (ギンリュウ属)	Sk (abscess) Aa (lumbago)	La L, S, R	Apply on wound Boil with rice husk	Y-2 K-1	Cultivated
59 <i>Phyllanthus reticulatus</i> POIR. (シマコバンノキ) RUTACEAE (ミカン科)	Ai (hemorrhoids)	W, R	Boil and drink	Y-1	Root is best
60 <i>Clausena excavata</i> var. <i>excavata</i> (カザンコウ)	O, Mt (mosquito repellent) Ap Sk (wound) P (dizziness)	L, R R L L	Crush (L) or boil (R), take as a tonic Boil and drink Crush and roast, use to cover wound For bathing	A-1 Y-1 A-2 K-1	Like <i>Phyllanthus</i> leaf
61 <i>Evodia glomerata</i> CRAIB (ハマセンダン属)	Re (cough)	R	Boil and drink	K-1	
62 <i>E. triphylla</i> DC. BURSERACEAE (カンラン科)	Sk (itching)	R	Apply on skin	Y-2	
63 <i>Carranga pinnata</i> ROXB. (カンラン属)	Ai (wound) Sk (abscess)	L B	Crush fresh (L), or powdered (L), apply on wound Roast, put the B. on the abscess	A-1 A-1	
ANACARDIACEAE (ウルシ科)					
64 <i>Rhus chinensis</i> MILL. (スルデ)	Ai, Re (wound, pharyngalgia) Ai (external injury)	Se, S S, L, R	Powder the (Se) and (S), put on wound Boil solution, wash wound	A-1 H-1	
CELASTRACEAE (ニシキギ科)					
65 <i>Celastrus monospermus</i> ROXB. (ツルウメモドキ属)	G, Aa (puerperium, lumbago)	W	Boil and drink	Y-1	
STAPHYLEACEAE (ミツバウツギ科)					
66 <i>Trapinina pomifera</i> WALL. ex DC. (ショウベンノキ属)	H	R	Boil and drink	A-1	
ICACINACEAE (クロタキカヅラ科)					
67 <i>Pittosporopsis kerrii</i> CRAIB	Ud (body swelling)	R	Boil and drink	Y-1	

Table 2 (continued)

Botanical name	Used for ^{*1}	Part ^{*2} used	Preparation	Hill ^{*3} tribe	Remarks
RHAMNACEAE (クロウメモドキ科)					
68 <i>Ventilago calyculata</i> TUL.	BI (hematinic)	S	Boil, drink solution or drink liquid directly from (S) after cutting it	Y-1	
VITACEAE (ブドウ科)					
69 <i>Cayratia wrayi</i> GAGNEP. (ヤブガラシ属)	P (epilepsy)	R	Boil and drink, in emergency take fresh (R)	Y-1	
70 <i>Cissus</i> sp. (ヒレブドウ属)	G (puerperium, lactation)	L, Br	Eat or boil (Br) and bathe	Y-2	
LEEACEAE (ウドノキ科)					
71 <i>Leea indica</i> MEER. (レニア属)	D (diarrhea) D (peptic ulcer, abdominal tumor)	R S, R	Boil and drink Boil and drink	H-1 A-1	
TILIACEAE (シナノキ科)					
72 <i>Triumfetta pilosa</i> ROTH (ラセンソウ属)	O —	—	—	H-1	
MALVACEAE (アオイ科)					
73 <i>Hibiscus macrophyllus</i> ROXB. ex HORN. (ブツソウ属)	O —	—	—	Y-2	
74 <i>H. rosa-sinensis</i> LINN. (ブツソウ)	Ai, D (conjunctivitis, jaundice)	S, L, R	Boil and drink	A-1	
75 <i>Sida rhombifolia</i> LINN. (キンゴジカ)	G (puerperium)	R	Boil and drink or use to bathe	Y-2	
76 <i>Urena lobata</i> subsp. <i>lobata</i> var. <i>lobata</i>	G (prevention of premature labor)	R	Boil 1-2 cups, and drink during months 7-8 of pregnancy	Y-1	Weed
	BI (hemostatic)	L	Crush and cover wound	H-1	
	O —	R	Boil	H-1	Mix with No. 163
STERCULIACEAE (アオイギリ科)					
77 <i>Helicteres ptelea</i> KCCZ (ヤンノミルゴマ属)	D (stomachache)	R	Boil and drink	A-1	Weed
78 <i>Sterculia lanceolata</i> CAV. (サムロン)	I (measles, varicella) Aa (arthralgia, muscle pain)	R R	— Boil and drink	Y-2 A-1	
FLACOURTIACEAE (アイギリ科)					
79 <i>Homalium ceylanicum</i> BTH.	G (dysmenorrhea)	R	Boil and drink	H-1	Mix with No. 138
CUCURBITACEAE (ウリ科)					
80 <i>Lagenaria siceraria</i> STAN. (ユウガオ)	D (abdominal pain)	—	—	A-1	Mix with No. 219 Cultivated
81 <i>Trichosanthes rubriflos</i> THOR. ex CAY. (カラスウリ属)	BI (hemostatic)	L	Crush and cover wound	H-1	
MYRTACEAE (フトモモ科)					
82 <i>Decaspermum fruticosum</i> J.R. & G. FORST. (コウシュンツグ)	Ai (infected wound)	L	Eat fresh (L)	A-2	White flower
83 <i>Psidium guajava</i> LINN. (マンジロウ)	D (diarrhea)	L	Chew and eat	A-1	Hold breath while collecting (L). Cultivated
	G (puerperium)	L, R	Boil and drink	H-1	Mix with No. 119
MELASTOMATACEAE (メボタン科)					
84 <i>Melastoma normale</i> var. <i>normale</i> (メボタン属)	Ai (burns)	L	Crush dry (L) on wounds	A-2	
	G (puerperium)	R	Boil and drink	H-1	Mix with No. 104
ARALIACEAE (ウコギ科)					
85 <i>Acanthopanax trifoliatum</i> MERR. (ウコギ属)	Aa (toothache)	S	Put on aching tooth	A-1	Cultivated
86 <i>Schefflera denkeana</i> CRAB. (フカノキ属)	Ai (fracture)	S	Crush and hold on wound	K-2	
87 <i>Trevesia palmata</i> VIS.	I (venereal disease)	L, S	Boil and use solution to clean wound	Y-1	

Table 2 (continued)

Botanical name	Used for*1	Part**2 used	Preparation	Hill**3 tribe	Remarks
UMBELLIFERAE (セリ科)					
88 <i>Angelica acutiloba</i> KITAGAWA (トウキ)	Mt (weakness)	—	—	H-1	Better than No. 21
	Mt (weakness)	—	—	H-1	
89 <i>Centella asiatica</i> URB. (ツボクサ)	Aa (toothache, lumbago)	W	Boil and drink	H-1	
90 <i>Eryngium foetidum</i> LINN. (オオバコエンドロ)	Aa (toothache)	L	—	K-1	
91 <i>Hydrocotyle javanica</i> THUNB. (オオバチドメ)	Aa (lumbago)	W	Boil with sugar	K-1	
92 <i>Oenanthe javanica</i> DC. (セリ)	C (antihypertonica)	—	Eat plants fresh or cooked in food	Y-2	
MYRSINACEAE (ヤブコウジ科)					
93 <i>Ardisia garrettii</i> FL. (ヤブコウジ属)	Mt (weakness)	R	Boil and drink	A-1	
94 <i>Embelia villosa</i> WALL. (エンベリア属)	Ai (hemorrhoids)	R	Boil and drink	K-1	
95 <i>Maesa montana</i> A. DC. (イズセンリョウ属)	D, I, O (stomatitis, stomachache, antihelmintic, chill)	Fl, S, R	Boil and drink	Y-1	
	G (puerperium)	R	Boil and drink	H-1	Mix with No. 104
96 <i>M. ramentacea</i> WALL.	Ai (wound)	L	Crush, or powder (L), put on wound	A-2	
OLEACEAE (モクセイ科)					
97 <i>Jasminum glandulosum</i> WALL. ex G. DON. (オウバイ属)	Ud	S, R	Boil and drink	Y-1	
98 <i>Jasminum nervosum</i> LOUR.	Ap (discomfort)	—	Boil and eat	Y-2	
	D (cholelithiasis)	L, S	Boil and drink	A-2	
	D, G (peptic ulcer, loss of quickening)	L, S	Mix with egg and roast before eating	H-1	
LOGANIACEAE (フジツギ科)					
99 <i>Buddleia asiatica</i> LOUR. (タイワンフジツギ)	Aa (muscle pain)	R	Boil with other plants and chicken	H-1	
	Ai (burn)	L, W	Crush, and mix with water, and put on wound	K-1	
APOCYNACEAE (キョウチクトウ科)					
100 <i>Akstonia scholaris</i> var. <i>scholaris</i> (シマソケイ)	Ai (wound with pus)	L	Crush in water, use solution to clean, or cover the wound	A-2	
101 <i>Anodendron</i> sp. (サカキカズラ属)	I (venereal disease)	L	Crush, and apply, or boil and use solution to clean wound	Y-1	
102 <i>Rauvolfia ophiorrhizoides</i> KERR (ホウライアオキ属)	Ap	R	Boil and drink	Y-1	
103 <i>Tabernaemontana corymbosa</i> (Amsonia) ROXB. ex WALL. (チョウジソウ属)	H	S	Boil and drink	A-2	Use like No. 216
ASCLEPIADACEAE (ガガイモ科)					
104 <i>Gymnema</i> sp. (ギムネマ属)	Md (cleaning of wound)	S	Boiled solution for washing wound	Y-1	
RUBIACEAE (アカネ科)					
105 <i>Canthium parvifolium</i> ROXB.	O (cosmetic: black color)	L	Roast and put on skin	A-1	
106 <i>Gardenia jasminoides</i> ELLIS (コリンクチナシ)	D, Bl (jaundice, anemia)	L, S, R	Boil and drink	A-1	Mix with No. 91
107 <i>Hedyotis capitellata</i> var. <i>pubescens</i> KURZ (フタバムグラ属)	D (dyspepsia)	S	—	Y-1	

Table 2 (continued)

Botanical name	Used for ^{*1}	Part ^{**2} used	Preparation	Hill ^{***3} tribe	Remarks
108 <i>Ixora cibbela</i> CRAIB (サンダンカ属)	I (abscess)	R	Grind and mix with No. 34	K-1	Mix with No. 99
	O (cosmetic: black color)	S	Boil and drink	A 1	
	G (dysmenorrhea)	R	Boil and drink	H-1	
109 <i>Morinda angustifolia</i> var. <i>scabridula</i> CRAIB (ヤエヤマアオキ属)	D, Ap (jaundice, chills)	S	Boil and drink	Y-1	
110 <i>Mussaenda parva</i> WALL. ex G. DON (コンロンカ属)	Sk (herpes zoster)	L, S.	Crush in warm water, apply solution on lesion	A-2	
111 <i>Mycetia gracilis</i> CRAIB	G (aid to bring about pregnancy)	R	Boil and drink	Y-1	
112 <i>M. siamensis</i> FUKU.	Bl, Mg (internal bleeding, emaciation)	S	Boil and drink	A-2	Mix with No. 105
113 <i>Paederia plifera</i> HK. f. (ヘクソカズラ属)	Ai (wound)	L	Dry and grind, then put on wound	A 1	
114 <i>Psychotria ophioclyoides</i> WALL. (ボチャウジ属)	O (corrigent)	R	—	Y 1	Rare
115 <i>P. siamica</i> HUTCH.	G (aid to bring about pregnancy)	R	—	Y 1	
116 <i>Vangueria pubescens</i> KURZ CONVOLVULACEAE (ヒルガオ科)	Aa (muscle pain)	S, R	Boil and drink	H 1	
117 <i>Argyrea oblecta</i> CL. VERBENACEAE (クマツヅラ科)	H (food allergy)	R	Boil and drink	K 2	
118 <i>Callicarpa longifolia</i> var. <i>lanceolaria</i> CL. (ムラサキシキブ属)	P (vertigo)	L, S, R	Boil and drink	A 1	
119 <i>Clerodendrum glandulosum</i> COLEBR. ex LDF. (クサギ属)	Ud Ai (hemorrhoids)	R R L, R	Boil Boil and eat Boil	Y 1 A 1 H 1	
120 <i>C. serratum</i> var. <i>wallichii</i> CL. (ウスギクサギ)	Ai (abscess)	L, R	L: Roast before use R: Boil and drink	Y 1	Mix with No. 66 use for fever
	I (dysentery, malaria)	R	Boil and drink	A 1	
121 <i>Congea tomentosa</i> var. <i>tomentosa</i>	I, Ai (malaria, wound, burn)	Fl, S, R	Boil and drink	A 1	
122 <i>Vitex trifolia</i> var. <i>trifolia</i> (ミツバハマゴウ) LABIATAE (シソ科)	P (dizziness)	W	Boil and crush	K 1	
123 <i>Agastache rugosa</i> O. K. (カワミドリ)	O —	—	—	H 1	
124 <i>Colquhounia elegans</i> var. <i>tenuiflora</i> PRAIN	H	R	Boil and drink	H 1	
125 <i>Elsholtzia winitiana</i> CRAIB (ナギナタコウジュ属)	I (venereal disease) Bl (hemostatic)	R L	Boil and drink Crush and cover wound	K 1 H 1	
126 <i>Ocimum basilicum</i> LINN. (メボウキ) SOLANACEAE (ナス科)	O (remove dirt from eyes)	Se	—	A 1	Cultivated
127 <i>Solanum mammosum</i> LINN. (ツノナス)	P (opium withdrawal syndrome, mental disorder)	Fr, R	—	K 1	
128 <i>S. torvum</i> SWZ. (スズメナスビ)	I (tuberculosis)	R	Boil and drink	A 2	Mix with No. 140
129 <i>S. verbascifolium</i> LINN. (ヤンバルナスビ)	Ai (tendonitis)	S	Boil, use solution to wash affected arm	H 1	
	O —	R	Boil	H 1	Mix with Nos. 95, 165
SCROPHULARIACEAE (ゴマノハグサ科)					
130 <i>Scoparia dulcis</i> LINN. (シマカナビキソウ)	H (food allergy)	R	Boil	H 1	Mix with No. 95

Table 2 (continued)

Botanical name	Used for ^{*1}	Part ^{*2} used	Preparation	Hill ^{*3} tribe	Remarks
BIGNONIACEAE (ノウゼンカズラ科)					
131 <i>Oroxylum indicum</i> VENT. (ツリザヤノキ)	D (heartburn)	L, B	Roast and put on abdomen	A 1	
ACANTHACEAE (キツネノマゴ科)					
132 <i>Barleria lupulina</i> LINDL. (バレイシア属)	Md (snakebite)	L	Crush and wrap around wound	Y-2	Cultivated
133 <i>Choresthes racemiflora</i> var. <i>racemiflora</i>	G (puerperium)	R	Boil and drink	Y 1	
134 <i>Eranthemum tetragonum</i> WALL. ex NEES	Aa, P (bone pain, muscle pain, neurosis)	S, R	Boil and drink	Y 1	
135 <i>Gendarussa vulgaris</i> NEES	P (opium addiction)	R	Boil and drink	K 1	Mix with 2-3 kinds of plant
136 <i>Justicia (mananthes)</i> (キツネノマゴ属)	Ai (contusion)	L, S	Wrap around the affected part	A 1	Cultivated
137 <i>Sericocalyx quadrifarius</i> BREM.	G (puerperium)	R	Boil and drink	Y 1	
138 <i>Strobilanthes lancifolius</i> T. AND. (イセハナビ属)	Ap	L	Crush and wrap around the fevered leg	A 1	Cultivated
139 <i>Thunbergia grandiflora</i> var. <i>grandiflora</i> (ベンガルヤハズカズラ)	Re (cough) G (puerperium)	- L, S, R	Boil and drink Boil and drink	Y-2 Y-1	
PLANTAGINACEAE (オオバコ科)					
140 <i>Plantago major</i> LINN. (オニオオバコ)	Aa (tendonitis, bone pain)	R	Poultice	K 1	Brought from elsewhere
CAPRIFOLIACEAE (スイカズラ科)					
141 <i>Sambucus javanica</i> REINW. ex BL. (ソクス)	Ai (abscess, swelling)	L	Crush and wrap against wound	A 1	Mix with No. 189
COMPOSITAE (キク科)					
142 <i>Artemisia conyzoides</i> LINN. (ヨモギ属)	D (stomachache)	Fl, L	Chew and eat	A 1	Weed
143 <i>A. indica</i> WILLD.	D (jaundice)	L, R	—	K 1	Mix with No. 208
144 <i>A. lactiflora</i> WALL. ex DC. (ヨモギナ)	Ai (abscess, pimples)	L	Crush and hold around lesion	A 1	Cultivated
	Mt		—	Y-2	Cultivated, one of seven plants used as tonic
145 <i>Bidens pilosa</i> LINN. (コセンダングサ)	I (varicella)	R	—	Y-3	Weed
146 <i>Blumea balsamifera</i> DC. (タカサゴギク)	I (venereal disease) G (puerperium) Mt (lassitude)	L R R	Boil and drink	Y-2 A-1 K-2	Change (L) every day
147 <i>Conyza sumatrensis</i> WALK. (Syn.: <i>Erigeron</i>) (オオアレチノギク)	G (puerperium, uterine pain after labor)	R	Boil and drink	H-3	Mix with (L) of No. 104
148 <i>Elephantopus scaber</i> LINN. (ミスミグサ)	Ap	W	Boil and drink	K-3	Use with No. 56
149 <i>Eupatorium adenophorum</i> SPRENG (フジバカマ属)	Bl (hemostatic)	L	Crush and cover wound	H-1	
150 <i>E. odoratum</i> LINN. (ヒマワリヒヨドリ)	Bl (hemostatic)	L	Crush and cut apply on wound	Y-3	
151 <i>E. stoeckadosum</i> HANCE	Aa (otalgia)	L	Dry, alcohol extract solution	A-1	Cultivated
152 <i>Eupatorium</i> sp.	O —	—	—	H-1	
153 <i>Gynura</i> sp. (サンシチソウ属)	Mt	L, S	—	Y-2	One of seven plants used as tonic
154 <i>Laggera alata</i> SCH. BIP. ex OLIV.	Sk (counterirritant)	L	Crush and apply to irritated area	Y-1	
155 <i>L. pterodonata</i> SCH. BIP. ex OLIV.	O (fever)	R	—	Y-2	

Table 2 (continued)

Botanical name	Used for ¹	Part ² used	Preparation	Hill ³ tribe	Remarks
156 <i>Myriactis nepalensis</i> LESS. (ヒメキクタビラコ属)	O	—	—	Y-2	Cultivated
157 <i>Vernonia cinerea</i> var. <i>cinerea</i> (ムラサキムカシヨモギ)	D (laxative)	R	—	Y-2	
158 <i>V. parishii</i> HK. f.	D (stomachic)	R	Boil and eat	K-1	
159 one COMPOSITAE LILIACEAE (ユリ科)	Mg (diabetes mellitus)	W	Boil	H-1	
160 <i>Disporum calcaratum</i> WALL. ex G. DON (チゴユリ属)	Aa, U (lumbago, pollakiuria)	R	Boil and drink	Y-1	
161 <i>Peliosanthes teta</i> subsp. <i>humilis</i> JESS.	Rc (pharyngalgia) Aa (lumbago)	S, L, W Rh, R	Boil and drink Boil and drink	Y-1 H-1	
162 <i>Smilax ovalifolia</i> ROXB. (サルトリイバラ属)	Md (snake bite)	L, La	Cover wound with sap or crush (L), and cover	A-2	
163 <i>S. perfoliata</i> LOUR.	Ai (hemorrhoids)	R	Boil and drink	K-2	
164 <i>S. zeylanica</i> subsp. <i>hemsleyana</i> T. KOY. AMARYLLIDACEAE (ヒガンバナ科)	D, Mt (stomachache, weakness)	R	Boil and drink	H-1	
165 <i>Crinum asiaticum</i> LINN. (ハマオモト)	Rc (pharyngalgia)	L, R	Macerate in alcohol	Y-2	Cultivated
166 <i>Eleutherine palmifolia</i> HERR. IRIDACEAE (アヤメ科)	Sk (wound, cleaning of wound)	W	Dry: Boil and drink Fresh: Crush and use solution to clean wound	K-1	
167 <i>Forrestia mollissima</i> f. <i>mollissima</i> GRAMINEAE (イネ科)	H	L, S	Boil and drink	Y-1	
168 <i>Arundinella bengalensis</i> DRUCE (トゲシバ属)	D (eructations)	L, W	Boil and drink	K-1	
169 <i>Coix lacryma-jobi</i> LINN. (ジュズダマ)	O (corrigent)	Rh, R	—	K-1	
170 <i>Microstegium vagans</i> AC. (アシボソ属)	Aa (lumbago)	L, S, R	Boil and drink	H-1	
171 <i>Aglaonema siamense</i> ENGL. (アグラオネマ属)	Aa (sores)	S	Roast and hold around the sore	Y-1	
172 <i>Homalomena occulta</i> SCHOTT	P (rabies, tetanus)	S	Crush and cover wound	Y-1	
173 <i>Syngonium podophyllum</i> SCHOTT ZINGIBERACEAE (ショウガ科)	Aa (lumbago)	L, S	Boil and use solution to bathe	Y-2	Cultivated
174 <i>Alpinia malaccensis</i> ROSC. (ハナミョウガ属)	D (jaundice)	R	—	K-2	
175 <i>Annonum ovoideum</i> PIERRE ex GEGNEP.	C (arrhythmia)	Fr	Steam with chicken and heart of pig and eat	Y-1	
176 <i>Estringera littoralis</i> GISE.	H	R	Boil and drink	A-2	
177 <i>Kaempheria rotunda</i> LINN. (バンガジュツ)	Md (centipede bite)	R	crush and cover wound	Y-1	
178 <i>Kaempheria</i> sp.	D, Ai (stomachache, wound)	Rh	Boil and drink, crush, put on wound; drink	K-1	
179 <i>Kaempheria</i> sp. ORCHIDACEAE (ラン科)	T (abdominal tumor)	L, Rh, R	—	A-1	Cultivated
180 <i>Dendrobium</i> sp. (セキコタ属)	D (eructations)	Rh	—	K-1	Mix with No. 111
181 Unknown	Ud, Uc	L	Chew and eat fresh (L)	A-1	From forest
182 Unknown	Sk, G (pimples, puerperium)	R	Boil and use solution to bathe	Y-2	
	D (stomachache, diarrhea)	S, R	Boil and drink	H-1	

Table 3. Number of preparations of medicinal plant species used for symptoms of diseases or disordered organ systems

Effect or organ affected	Abbreviation	No. of preparations available
Psychoneurogenic effect	P	11
Anti-hypersensitivity (anti-allergy)	H	11
Anti-inflammatory	Ai	35
Anti-pyretic	Ap	12
Analgesic	Aa	23
	A	70
Circulatory system	C	4
Respiratory system (expectorant)	Re	3
Respiratory system (common cold)	Rc	4
	Rs	7
Digestive organs	D	29
Drug related to metabolism (general)	Mg	3
Drug related to metabolism (detoxication)	Md	4
Drug related to metabolism (tonic)	Mt	14
	M	21
Urinary organs (general)	Ug	1
Urinary organs (diuretic)	Ud	7
Urinary organs (calculus)	Uc	3
	U	11
Gynecologic	G	25
Infectious disease	I	15
Anti-tumor	T	1
Blood function	Bl	9
Skin disease	Sk	14
Other	O	13
Total		241

3. Results

Folk medicinal plants reported as being used by the hill tribes, totalling 182 species (including three unidentified ones), from which 241 preparations were made, are classified by method of use or the pharmacological effect they are believed to have in Table 3. The list may not be a complete one. In addition to being used in tonics, the plants had a wide range of reported medical uses, including diseases during pregnancy, internal, surgical, and skin diseases, and diseases in both children and adults. The percentage of preparations intended for particular uses with the 241 preparations as 100%, are shown in Fig. 2. Plants with an anti-inflammatory action (analgesic, antipyretic, and anti-inflammatory action) were the most common at 29.0%, followed by digestive, gynecologic, metabolic, infectious, and skin diseases, in that order.

4. Discussion

Almost the same kind of survey as was done in Thailand has been done in rural areas of Japan. The different survey areas and survey methods make direct comparison difficult, but results

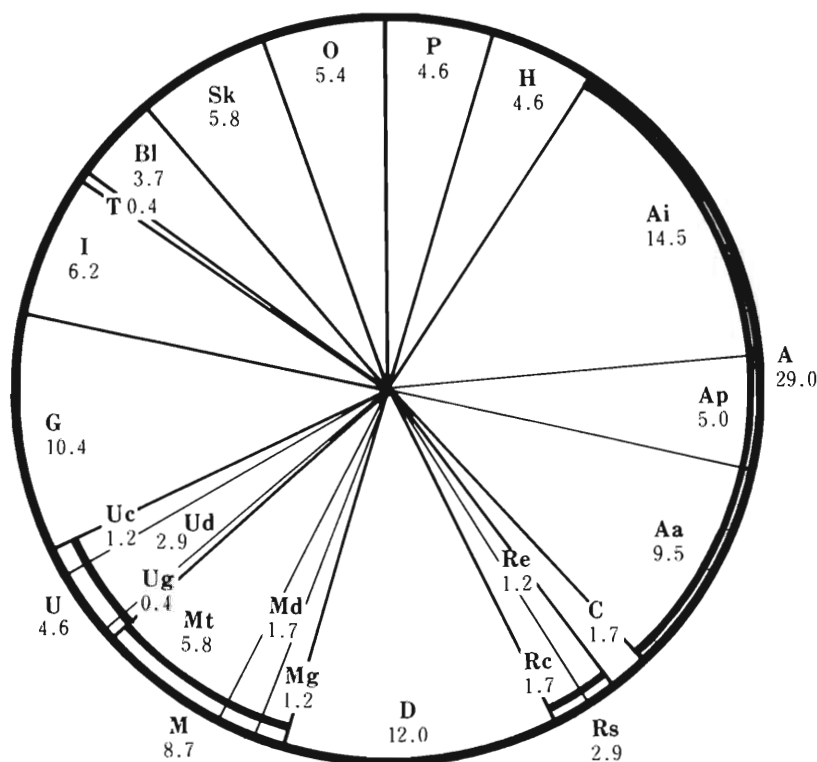


Fig. 2. Classification of medicinal plants in eight hill tribal villages in northern Thailand
Letters show the use, indication, or disease (see Table 3)
Numbers written under the letters shows the proportion of each use as a percentage of the total uses.

obtained in 1969 from Totsukawa Village³⁾, Nara Prefecture, in the Kinki region, and in 1971 in Toga Village²⁾, Toyama Prefecture, in Hokuriku are compared with those obtained from the hill tribes in Thailand in Table 4-1 to -4.

Some 182 species of plants (three unidentified) were used for folk medicine in the form of 241 preparations in northern Thailand. Sixteen, 57, and 13 species in reports from India³⁾, China⁴⁾, and Japan⁵⁾ are in common with those we were shown in northern Thailand. Since minority tribes in China also use some one third of the plants used by the hill tribes in Thailand, these groups may have common ancestors. The results of surveys on folk medicines in Japan gave information on 3,710 preparations in Totsukawa Village and 2,467 in Toga Village, more than ten times the number of preparations we learned about in Thailand. This difference may be due to differences in population size, duration of the period of settlement, and other historical and cultural differences. The medicinal uses in Japan of such plants as mushrooms, lichens, and gymnosperms were not observed in northern Thailand in this survey (Table 4-1).

In Thailand, the portion of the plants that was used most often was the root (36.3%), followed in order by the leaf (28.1%), stem (21.5%), whole plant (5.0%), and fruit (1.0%). In Japan, for Totsukawa, the order is the leaf (25.8%), root (18.0%), whole plant (16.6%), fruit (13.0%) and stem (9.1%), and for Toga, the order is the whole plant (41.9%), leaf (18.2%), root (11.1%), stem (9.4%), and fruit (5.1%). Many plants synthesize a variety kinds of chemicals in the leaves and accumulate them in the roots, especially perennial plants. It is of interest that roots are used more

Table 4-1 Comparison of the number of family species used as medicinal plants in eight villages in Thailand and two villages^{1,2)} in Japan

Place	Total	Cryptogamae	Gymnospermae	Archichlamydeae	Metachlamydeae	Momocotyledoneae
Thailand, 8 villages	179*	7	0	85	66	21
Japan, Totsukawa V.	239	17	8	118	56	40
Toga V.	132	4	3	76	30	19

* Three other species were not identified

Table 4-2 Comparison of the number of utilizing cases of the plant parts for the medicinal treatment in Thailand and Japan

Place	Whool plant	Root, rhizome	Stem	Leaf	Flower	Fruit	Seed	Latex, sap	Uniden- tified	Total
Thailand, 8 villages	15	110	65	85	3	3	2	3	17	303
Japan, Totsukawa V.	615	667	336	956	210	484	78	115	249	3710
Toga V.	1033	275	231	449	23	127	5	14	310	2467

Table 4-3 Routes of administration for preparations of medicinal plants in Thailand and Japan

Place	Oral application						External application				Uniden- tified	Total
	Decoct	Char	Liquor	Juice	Entire part	Other	Juice	Paste	Bath	Others		
Thailand, 8 villages	107	0	3	3	18	3	3	52	7	0	36	232
Japan, Totsukawa V.	1662	60	19	219	227	121	368	700	180	61	93	3710
Toga V.	1165	0	59	29	151	0	60	391	246	56	310	2467

Table 4-4 Numbers of plant preparations used for symptoms or organ systems

Place	P	H, A, Sk	Rs	C, Bl	D	G	U	Pd	An	Id (M, I, T)	uniden- tified	Total
Thailand, 8 villages	11	95	7	13	29	25	11	—	0	37	13	241
Japan, Totsukawa V.	133	1040	611	291	879	126	63	122	12	182	249	3710
Toga V.	180	485	96	488	556	63	43	25	1	220	310	2467

Abbreviated letters show the use, indication, or disease (see Table 3 besides Pd: Pediatric disease; An: Animal diseases and Id: Idiosyncratic disease).

often for medical treatment in Thailand, where is warmer than Japan (Table 4-2).

Folk medicine was generally either taken orally or applied externally. The percentages of both routes of administration in Thailand (T) were almost the same as those in Japan (A, Totsukawa ; B, Toga), with oral administration about 60% of all uses (T, 57.8% ; A, 62.2% ; B, 56.9%) and external application about 30% (T, 26.7% ; A, 35.3% ; B, 30.5%). About 45% of the preparations are mainly given in the form of a decoction (T, 46.0% ; A, 44.8% ; B, 47.2%). The popularity of decoctions may be because drying in the sun or shade makes such preservation feasible, or because people drink decoctions as they might drink tea. Eating the entire part harvested is another method by which such plants are used, at about 7% (T, 7.8% ; A, 6.1% ; B, 6.1%). In Thailand, external application is mainly achieved as stupes made of leaves, but in Japan only about half of the preparations for external use are applied as stupes, followed by the application as stupe juice, and addition to the bath. It is interesting to note that in Thailand, ingredients are added to the bath for the treatment of disease, but in Japan, they are added to increase the warming effect of the bath (Table 4-3).

The frequency of the use of preparations for an anti-inflammatory effect was the same in Thailand and Japan, but for the respiratory, digestive, and circulatory systems, frequencies were lower in Thailand, and while for urinary and gynecological systems, frequencies were higher (Table 4-4). The differences may be caused by differences in the frequency of different diseases in the areas surveyed. In the hill tribal villages of northern Thailand, there are many subjects with infectious diseases of the respiratory and digestive systems, such as tuberculosis, typhoid fever, and dysentery, but the indications for these diseases were classified together as "infectious diseases", and as a result, the frequency of uses for respiratory and digestive systems was lower than it would be otherwise. Hypertension is a rare disease in the hill tribes because of their low-salt diet, decreasing the frequency of uses for the blood and the circulatory system. Shortages of water to drink in the dry season may cause a rise in the use of plants with effects on the urinary organs. Insufficient medical services and economic pressure may cause a desire for early recovery from the puerperal period, resulting in frequent uses of gynecological preparations. It was of interest that 5.8% of the uses of plants were of those with tonic effect. Possibly their hard and monotonous life leads to use of plants with psychoneurogenic activity, to suppress opium poisoning, and there are several plants with anticonvulsive effects.

5. Conclusions

The results presented were based on our survey done with the help of 12 village herbalists. The results need to be verified by their clinical utility on a scientific basis. Some confusion must have arisen because of attitudes such as a lack of openness toward outsiders and the existence of false reports. Still, the folk medicines of the four hill tribes compiled here are possible sources of substances for future research in the medical and pharmaceutical fields.

Recently, interest in folk medicine outside any one country has increased. In Japan, in particular, several universities and pharmaceutical companies are doing research on local folk medicine in Southeast Asia. Our joint research program on the folk medicine of hill tribes in Thailand is meaningful in establishing a base for human medical research in the future.

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タイ北部の山岳民族における 薬用植物の利用について

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ブーンカナ トングサエン, スリン ニルサムランチット,
鈴木有朋, 筒井 暉

要 約

近畿大学とタイ国チェンマイ大学との共同研究,
“タイ国における有用植物の栽培とその薬理効果に
関する研究”の一環として, タイに自生する有用植
物を探索する目的からタイ北部の山岳地域に在住す
る4部族の計8集落を訪れた。そこで各集落の民間
薬利用の専門家と対面して, 病気の症状, 使用植物,

使用方法, 効果などについて聞き取り調査をした。
特に植物については, 現地で現物を確認した後, 標
本を作り同定し, これらの結果を一覧表にまとめた。
その結果, これらの山岳民族は, 現在でも総計182種
の植物を241ケースの民間薬として, 利用しているこ
とが示された。