
Report

Ethnobotanical survey of medicinal plants in the village of Kaingaran in Sabah, Malaysia
Julius KULIP¹, Julius Peter INDU² and Rustum MISON²

¹*Forest Research Centre, Forestry Department Sabah
P.O. Box 1407, Sepilok, Sandakan, Sabah, Malaysia*

²*Tambunan District Forestry Office
Post Box 64
89657 Tambunan, Sabah, Malaysia*

ABSTRACT. This paper presents the result of an ethnobotanical survey on medicinal plants of the Kadazandusun ethnic group in the village of Kaingaran, Tambunan district, Sabah, Malaysia. The survey was conducted during the 1st Trus Madi Scientific Expedition 3rd -12th November 2001. A total of 120 species of plants were collected. Forest plants species were used as medicinal plants more frequently compared to plant species from other habitats. The most frequently used plants for medicines were from the families of Rubiaceae, followed by Moraceae and Annonaceae. Fifty-six treated symptoms were recorded, with feverish cold and inflammation of the pancreas recorded the most frequently, followed by diarrhea, and stomachache.

INTRODUCTION

Ethnobotany, the study of how people in traditional societies use plants, especially for medicinal use, are an important link between traditional healers and the modern medicine industry. Medicinal plants have been used as curing and healing agents since time immemorial by local villagers especially the traditional healers who are the knowledgeable persons in a village and can locate and identify the desired medicinal plants from their surroundings. It is a summation of thousands of years of human experience in the selection of

plants, which is mostly passed on orally from one generation to the next. Many of the plant extracts used in western medicine were discovered through their uses in traditional societies. This puts Sabah in a greater state of urgency to document this valuable knowledge before it becomes extinct.

MATERIALS AND METHODS

The district of Tambunan is located in the interior part of Sabah, Malaysia (Fig. 1). The area is a basin surrounded by cultivated land and forested hills. It is about 90 km from the state capital, Kota Kinabalu, by road. The people in this district belong to the Kadazandusun ethnic group. The majority of the population are farmers. They plant wet and hill paddy as their staple food and very much depend on forest resources for their daily life such as for firewood, construction, handicraft, food and medicines.

The village of Kaingaran, where the study was conducted, is located 5 km to the east of Tambunan town center and lies 1,500 meter above sea level. The road to this village is gravel and it normally takes about 30 minutes to arrive by four-wheel drive vehicle. The total population in this village is approximately 2,000, which consist of 21 households. Agriculture is the main activity of the villagers, though some have found jobs in the logging industry nearby and in the township area. Due to the hilly and undulating terrain, people in this village plant hill paddy

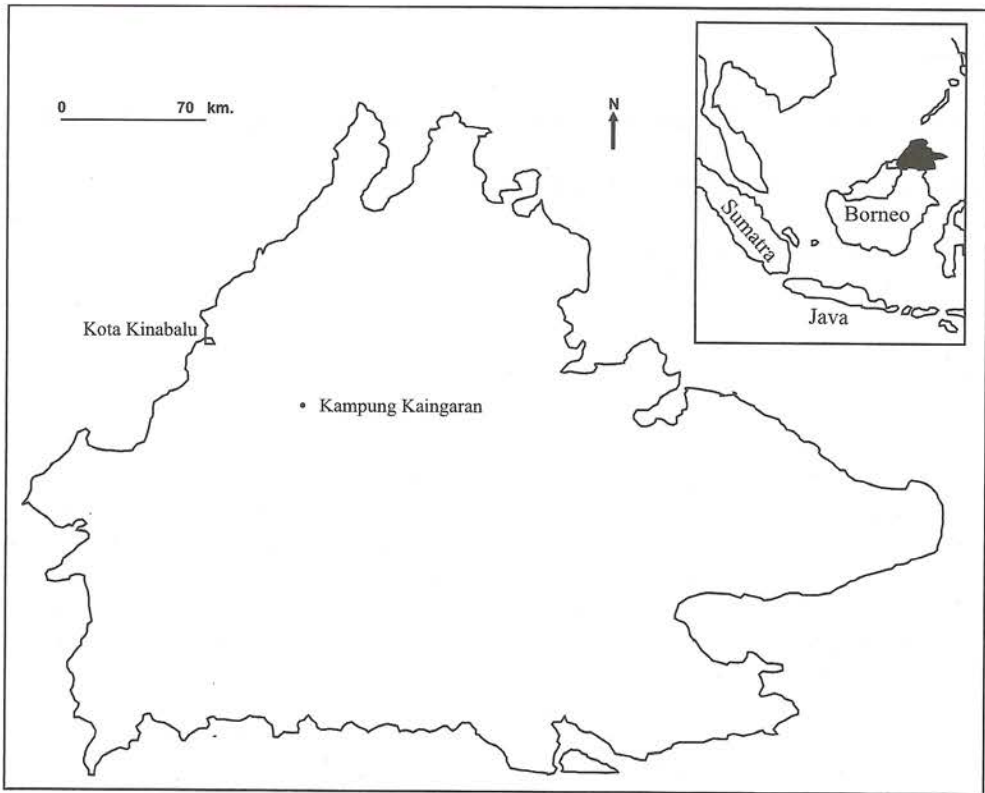


Fig. 1. Locality of the study area

as their staple food. This village is adjacent to Mt. Trus Madi and the villagers usually go into the forest to gather their daily needs including medicinal plants. Their lifestyle is influenced by the forest that surrounds them.

The survey of the village of Kaingaran was conducted during the 1st Scientific Expedition to Mt Trus Madi, which was jointly organized by the Institute of Biology and Conservation of Universiti Malaysia Sabah, Kota Kinabalu and the Forestry Department, Sabah, Malaysia from the 3rd until 12th of November 2001. A team from the Ethnobotany section, Forest Research Centre, Forestry Department Sabah was assisted by students of Universiti Malaysia Sabah. Three plant informants were engaged during the survey, namely Mr. Radin Gompoit (50 years old), Mr. Mojingol @ Michael Bin Ongut (60 Years) and Mr. Supin (80 Years old). The informants were interviewed in unstructured

interviews (Alexiades, 1996) in their houses and in the field. They were paid RM 20 per day per person as a token of appreciation for their help in this study replacing 'pikodou' (strengthening ties between two individuals). The plants were collected from or around the village, backyard gardens, hill cultivated garden, roadside, secondary forest and in undisturbed forest areas.

The symptoms of ailments recorded compared with the guidelines of Roper (1992) and Pescar and Nelson (1996).

RESULTS

One hundred and twenty species of medicinal plants were collected during the survey. Tables 1, 2 and 3 show the plant specimens collected according to their localities. Table 4 shows a list of unidentified plant specimens collected from the forest.

Table 1. Medicinal plants collected from house compound at Kaingaran village

FAMILY	FRCSE NO.	BOTANICAL NAME	LOCAL NAME	MEDICINAL USE	PART USED
Cecropiaceae	NC	<i>Poikilospermum</i> sp.	Soringkalang	Fainting	Sap of the root
Compositae	NC	<i>Blumea</i> sp.	Tawawo	Colic & Post-partum	Leaves & Root
	NC	<i>Elephantopus</i> sp.	Salaman	Cut & wounds & Flatulence	Young leaves
Euphorbiaceae	NC	<i>Phyllanthus</i> sp.	Nipon-nipon	Diarrhea	Whole plant
Gramineae	520	<i>Eleusine</i> sp.	Solinatad	Cut & wounds	Leaves
	NC	<i>Gigantochloa</i> sp.	Poring	Swollen pancreas	Sap
Malvaceae	NC	<i>Urena</i> sp.	Tondorupang	Boil	Flower
Melastomataceae	468	<i>Melastoma</i> sp.	Gosing	Diarrhea	Leaves
Moraceae	NC	<i>Ficus</i> sp.	Lintotobou topurak	Post partum & headache	Root & leaves
Myrtaceae	NC	<i>Psidium</i> sp.	Koliabas	Diarrhea	Leaves
Polygalaceae	NC	<i>Polygala</i> sp.	-	Heart problem	Whole plant
Polypodiaceae	NC	<i>Drynaria</i> sp.	Tapako	Snake-bite	Rhizome
Rubiaceae	NC	<i>Neonauclea</i> sp.	Intap	Diarrhea	Bark
Solanaceae	NC	<i>Solanum</i> sp.	-	Waist pain	Root
Umbelliferae	470	<i>Centella</i> sp.	Pegago	Stomach ache	Whole plant
Verbenaceae	NC	<i>Stachytarpheta</i> sp.	Sagandap	Poison antidote	Root
Zingiberaceae	NC	<i>Curcuma</i> sp.	Kunyt	Poison antidote	Whole plant

Table 2. Medicinal plants collected from hill cultivated land at Kaingaran village

FAMILY	FRCSE NO.	BOTANICAL NAME	LOCAL NAME	MEDICINAL USE	PART USED
Caricaceae	NC	<i>Carica</i> sp.	Tapayas	Gonorrhea	Mature leaves
Costaceae	NC	<i>Costus</i> sp.	Subor-subor	Sprain	Stem
Cucurbitaceae	NC	<i>Cucurbita</i> sp.	Tawadak	Scalding	Fruit
Gramineae	NC	<i>Imperata</i> sp.	paka	Boil	Rhizome
Meliaceae	NC	<i>Lansium</i> sp.	Langsat	Malaria and stomach ache	Bark
Musaceae	NC	<i>Musa</i> sp.	Togutui	Diarrhea	Sap
Solanaceae	NC	<i>Capsicum</i> sp.	Lado	White fungi on skin	Leaves
	NC	<i>Solanum</i> sp.	Tutan	Hypertension & to kill intestinal worms.	Leaves
Zingiberaceae	NC	<i>Zingiber</i> sp.	Layo	Runny nose	Rhizome

NC = Specimen not collected. Easily identified on the field.

Table 3. Medicinal plants collected from inside forest at Kaingaran village

FAMILY	FRCSE NO.	BOTANICAL NAME	LOCAL NAME	MEDICINAL USE	PLANT PART	
Apocynaceae	473	<i>Kopsia</i> sp.	Lodo-lodo	Toothache	Bark	
	538	<i>Tabernaemontana</i> sp.	Lado-lado	Old wound bleeds	Leaves	
Annonaceae	483	<i>Goniothalamus</i> sp.	Tuub	Stomach ache	Bark	
	536	<i>Uvaria</i> sp.	Bab	Inflammation of child's pancreas	Sap	
	500	<i>Uvaria</i> sp.	Bab	Swollen pancreas	Sap	
Araceae	501	<i>Xylopia</i> sp.	Linsou-linsou	Swelling of arm pit	Bark	
	479	<i>Alocasia</i> sp.	Tolinga Tambang	Caterpillar sting	Flesh	
Araliaceae	506	<i>Scindapsus</i> sp.	Timbolung lolou	Reduce swelling	Leaves	
	452	<i>Aralia</i> sp.	Rusap	Lactation for newly mother	Root	
	480	<i>Aralia</i> sp.	Rusap	Malaise	Root	
Arecaceae	522	<i>Schefflera</i> sp.	Malad-palad	Inflammation of pancreas	Leaves	
	525	<i>Calamus</i> sp.	Sarae	Beri-beri	Sap & pith	
Begoniaceae	539	<i>Begonia</i> sp.	Tonsom-onsom	White fungi on lip	Latex	
	490	<i>Begonia</i> sp.	Sompotungou	Vomiting	Root	
Cecropiaceae	531	<i>Poikilospermum</i> sp.	Saringkalang	Post-partum & Flatulence	Stem	
Compositae	453	<i>Crassocephalum</i> sp.	Lombon	Fractured	Leaves	
	519	<i>Crassocephalum</i> sp.	Lokop	Fractured	Young leaves	
Cytheaceae	466	<i>Cibotium</i> sp.	Paku	Antidote for Snake bite and boils	Young frond	
Dilleniaceae	535	<i>Tetracera</i> sp.	Pampam	Cough	Stem	
Euphorbiaceae	498	<i>Croton</i> sp.	Tolotok	Strengthens an unhealthy child	Leaves	
	449	<i>Homalanthus</i> sp.	Moropingan	Toothache	Bark	
	461	<i>Macaranga</i> sp.	Limbukon	Oral thrust	Sap	
Gesneriaceae	488	<i>Cyrtandra</i> sp.	Lumpoh	Swollen ankle	Young stem	
Gleicheniaceae	451	<i>Dicranopteris</i> sp.	Kawang-kawang	Reddish eye	Sap of the young frond	
Guttiferae	483	<i>Calophyllum</i> sp.	Bintangor	Back pain	Bark	
	527	<i>Calophyllum</i> sp.	Bintangor	Pimples & waist pain	Bark	
Hypoxidaceae	521	<i>Curculigo</i> sp.	Tambaka	Skin disease	Pith	
Lauraceae	516	<i>Litsea</i> sp.	Lindos	Flatulence	Root	
	485	<i>Actinodophne</i> sp.	Pongulobon kusai	Waist pain	Bark	
Leguminosae	447	<i>Spatholobus</i> sp.	Lipoi	Feverish cold	Sap	
	484	<i>Bauhinia</i> sp.	Kukuak	Extraction of boils	Young leaves	
	540	<i>Bauhenia</i> sp.	Tunturukon	Boil	Latex	
	448	<i>Scurrula</i> sp.	Tongom La'an	Toothache	Stem	
Lycopodiaceae	543	<i>Lycopodium</i> sp.	Rongilut	Feverish cold	New leaves	
Melastomataceae	468	<i>Melastoma</i> sp.	Gosing	Diarrhea	Leaves	
Menispermaceae	547	<i>Fibraea</i> sp.	Tapa bawang	Jaundice in baby & fatigue	Stem	
Moraceae	454	<i>Ficus</i> sp.	Tambunan	Swollen knee	Bark	
	459	<i>Ficus</i> sp.	Togung	Stomach ache	Latex	
	461	<i>Macaranga</i> sp.	Limbukon	Oral thrust	Sap	
	495	<i>Willughbera</i> sp.	Kombing	Stomach ache	Sap	
	548	<i>Ficus</i> sp.	Sintotobou kusai	Post partum treatment	Root	
	Myrsinaceae	464	<i>Embelia</i> sp.	Tonsomonsom	Itchy rashes	Leaves
		475	<i>Ardisia</i> sp.	Tolonsi	Feverish cold	Leaves
496		<i>Embelia</i> sp.	Sput	Cut and wound	Sap	
503		<i>Embelia</i> sp.	Bangkou-bangkou	Swollen pancreas, diarrhea	Sap	
Nepenthaceae	464	<i>Maesa</i> sp.	Tonsom-onsom	Itchy rashes	Leaves	
	482	<i>Nepenthes</i> sp.	Kukuanga	Syphilis	Root mix with <i>Areca catechu</i> fruit.	
Orchidaceae	526	<i>Nepenthes</i> sp.	Kukuanga	Syphilis	Root	
	456	<i>Flickingeria</i> sp.	-	Snake bite antidote	Bulb	
	474	<i>Epigeneium</i> sp.	Tapako	Feverish cold, antidote for snake bite	Bulb	
Palmae	512	<i>Appendicula</i> sp.	Sokot	Eye sore	Stem	
	517	<i>Calamus</i> sp.	Tuai Bondig	Impotence	Sap	
Piperaceae	455	<i>Piper</i> sp.	Bohuton	Caterpillar sting	Leaves	
Rubiaceae	450	<i>Uncaria</i> sp.	Kalawit	Gout	Young leaves	
	465	<i>Uncaria</i> sp.	Kalawit	Vomiting blood	Sap	
	469	<i>Paederia</i> sp.	Kombutong	Anti decaying of tooth	Bark	
	460	<i>Uncaria</i> sp.	Kalawit	Feverish cold & headache	Sap	
	505	<i>Mussaenda</i> sp.	Gayoh luba	Feverish cold	Leaves	
	469	<i>Paederia</i> sp.	Kombutong	Anti decaying of tooth	Bark	
	NC	<i>Neolamarckia</i> sp.	Towo	Beriberi	Bark	

continued Table 3.

FAMILY	FRCSE NO.	BOTANICAL NAME	LOCAL NAME	MEDICINAL USE	PLANT PART
Rutaceae	471	<i>Melicope</i> sp.	Pau	Beriberi	Leaves
Saurauiceae	491	<i>Saurauia</i> sp.	Longugan taragang	Swollen	Young leaves
	504	<i>Saurauia</i> sp.	Longugan totomou	Reduce swelling	Young leaves
Sapindaceae	487	<i>Lepisanthes</i> sp.	Boyongo	Mump	Young leaves and bark
Simaroubaceae	NC	<i>Eurycoma</i> sp.	Mumud mondou	Back pain	Root
Smilacaceae	NC	<i>Smilax</i> sp.	Tongkung kowilan	Food poisoning	Stem
Solanaceae	497	<i>Solanum</i> sp.	Tonsisiyah	Yellow of urine	Root
	458	<i>Solanum</i> sp.	Mansimang	Swollen tooth-gum	Root
Thelypteridaceae	541	<i>Pneumatopteris</i> sp.	Menampung	Flatulence & post partum treatment	Root & stem
Thymelaeaceae	499	<i>Wikstroemia</i> sp.	Tindot	Bodily pain	Stem
Umbelliferae	446	<i>Eryngium</i> sp.	Kosur	Sprain	Root
	518	<i>Hydrochyta</i> sp.	Pegago	Stomach ache	Whole plant
Urticaceae	530	<i>Pouzolzia</i> sp.	Komburiong	Easy delivery of baby	Young leaves
Zingiberaceae	472	<i>Etlingeria</i> sp.	Tuhau	Bloody stool, constipation	Pith
*Lecanorales	467	<i>Usnia</i> sp.	Longilut	Stomach ache	Whole plant

* Order (Lichen)
 NC = Specimen not collected.

Table 4. Unidentified plants collected from inside forest at Kaingaran village

FRCSE NO.	BOTANICAL NAME	LOCAL NAME	USE	PART USED
446		Kosur	Sprain	Root
448	Loranthaceae	Tangon laan	Toothache	Stem
452		Rusap	Lactation to new mother	Root
453	Asteraceae	Lombon	Bone fracture	Leaves
454		Tombunan	Swollen knee	Bark
462		Taragang-ragang	Chest pain & headache	Leaves
463		Kudis-kudis	Urticaria	Young leaves
469		Kombutong	To prevent tooth from decaying	Bark
475		Tolonsi	Feverish cold	Leaves
524		Kurap-kurap	Skin disease	Leaves
528		Siwod namatai	Internal cell growth	Whole plant
529	Compositae	Lampagang	Boil	Leaves
532	Asclepidaceae	Kombing	Gastritis	Sap
533	Annonaceae	Marapahu	Chest pain	Bark & stem
534	Compositae	Tindorokot	Hypertension	Whole plant
537	Annonaceae	Indaraah	White fungus on lip	Latex
542		Torukakang	Eye sore	Sap
545		Rimbau	Eye sore	Sap
546		Lobo	Inflammation of pancreas	Young leaves

Table 5. Number of plants and localities from which they were collected at Kaingaran village

LOCALITY	NUMBER OF SPECIES	%
BACKYARD GARDEN	17	14.16
HILL CULTIVATED GARDEN	9	7.5
PRIMARY FOREST	94	78.3
TOTAL	120	100

DISCUSSION AND CONCLUSION

Villagers in the village of Kaingaran once had a very rich knowledge of the use of traditional medicinal plants. The people who live in this village are very familiar with the medicinal properties of plants that grow in their surroundings. Once they were dependent on these plants for their well-being. Most of the plant materials collected are used fresh to obtain the extract from the entire plant or part thereof, whether they are leaves, bark, stem, roots, flowers or fruits. Dried plant parts are only used when they know that the particular plant is very difficult to find or rare. Since the early 1970s, the villagers prefer to go to the hospital in Tambunan township rather than use medicinal plants for several reasons, namely, the influence of modern medicine (easily available and cheap), the locality of the district hospital, which is just 30km away and knowledgeable villagers getting older (they cannot walk far and their eyesight is getting poorer). Thus, much ethnobotanical knowledge is lost and could not be passed on to the younger generations. Only a handful of knowledgeable people in this village still possess this knowledge, usually the elderly.

The plants collected for this study come from various localities, such as backyard gardens, hill cultivated garden and primary forest. In Table 5 are the numbers of plants and the localities from which they were collected.

Table 5 shows that the primary forest contains many medicinal plants: there are 94 species, or about 80% of the total collection compared to other habitats. This shows that the forest

represents nature's main storehouse of medicinal plants, upon which the villagers here depend. Out of 120 medicinal plants documented (Tables 1-4), 41 were tree species, 25 herbs, 23 shrubs, 19 climbers and 12 epiphytes. The most frequently used medicinal plants are from the families Rubiaceae, followed by Moraceae and Annonaceae. Fifty-six symptoms were recorded with feverish cold and inflammation of pancreas recording the highest, followed by diarrhea, stomach ache and antidote. The full identification of plant specimens has not been revealed. This is done on purpose to protect the Intellectual Properties Rights (IPR) of the villagers concerned. Any interested party who wants to do further research on these species should contact the first author.

ACKNOWLEDGEMENTS

We would like to thank all villagers in the village of Kaingaran, especially Mr. Radin Gompot (Head of Village), Mr. Mojingol @ Michael Bin Ongut and Mr. Supin who have helped directly in giving information on the uses of plants. Thanks to the staff of the Ethnobotany section of the FRC, namely Mr. Lajiman Wasai and Baraham Buhari who helped in the field work and preparation of plant specimens and the staff of the District Forest Office, Tambunan, who helped in lodging preparations. The plants were identified by the first author with the help of Ethnobotany Research Assistant George Majawat and staff of the Botany section. Last but not least, we would like to give thanks to the joint organizer, the Institute of Tropical Biology and Conservation of Universiti Malaysia Sabah, Kota Kinabalu, especially to

Dr. Monica Suleiman, the coordinator of this expedition. We also thank Dr. Sining Unchi, Head of the Forest Research Centre, Forestry Department, Sabah for cooperation given during the expedition.

REFERENCES

- Alexiades, M.N. (1996).** Collecting ethnobotanical data: an introduction to basic concepts and techniques. Pp. 53-94 In Miguel N. Alexiades and Jennie Wood Sheldon (eds.). *Selected guidelines for ethnobotanical research: a field manual*. The New York Botanical Garden, Bronx, New York.
- Fransworth, N.R., O. Akerele, A.S. Bingel, D.D. Soejarto & Z. Guo (1985).** Medicinal plants in therapy. Bull. *World Health Organiz.* 63: 965-981.
- Kitayama, K., J. Kulip, J. Nais, & A. Biun. (1993).** Vegetation survey on Mount Trus Madi, Borneo. A Prospective new mountain park. *Mountain Research and Development*, 13: 99-105.
- Kulip, J. (1996).** *A survey of indigenous plants used for food and medicine in Tambunan, Sabah.* Paper presented at the Borneo Research Council Fourth Biennial Conference of the Borneo Research Council, 10-15 June, University of Brunei Darussalam, Brunei Darussalam.
- Pescar, S.C. & C.A. Nelson. (1996).** *The Wordsworth Medical Companion. A Guide to Symptoms and Illness.* Mackays, Chatham, U.K.
- Roper, N. (1992).** *Churchill Livingstone Pocket Medicinal Dictionary.* 14th edition. Longman, Singapore.