Indigenous Knowledge on The Uses of Medicinal Plants by Dayak Benuaq Society, West Kutai, East Kalimantan

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ABSTRACT

Indonesia is well known as one of the biodiversity centers in the world, including natural drugs that highly needed recently. Indigenous knowledge on medicinal plants, especially in Dayak Benuaq society in West Kutai, East Kalimantan is presented. Sixty species of plants, belonging to 55 genera and 31 families, have been used as medicinal plants by Dayak Benuaq society. Most of them are grown widely. Some of medicinal plants can be used to cure approximately 38 kinds of diseases. Traditional ceremony, known as *balian*, is also used during medication.

Key words: Medicinal plants, Dayak Benuaq, East Kalimantan

INTRODUCTION

Indonesia is one of the world's richest areas for biodiversity, possessing approximately 17 % of the total number of recorded species in the world. Contained within its boundaries is 11 % of the world flora (Anonim, 1992) and at least 940 species of them are as sources of natural drugs (Hargono *et al*, 1986). The diversity of plants is quite high in Kalimantan, as a part of Borneo. Kalimantan covers 73 % of Borneo's landmass. It is rich in biodiversity and is an attractive place to study the ecosystem and the ethnic. One of them is Dayak Benuaq society who lives in surrounding areas of Mahakam, West Kutai, East Kalimantan. Indigenous knowledge of Dayak Benuaq society on medicinal plants for their daily life has not been reported yet.

Given these circumstances, this study focuses on the ethnobotany of medicinal and poisonous plants. There is no inventory or study on plant resources had been conducted in this area. This report is expected to contribute to the conservation of indigenous knowledge by local people who have explored the resources in their surrounding areas. Hopefully shifting areas, forest destruction and the decrease of environmental quality do not give negative impact to Kutai as a whole. This situation quite worrying especially when the lost of natural resources and indigenous knowledge of local people involved.

METHODOLOGY

The ethnobotanical information and collection of medicinal plant were undertook in Jempang district, West Kutai regency, East Kalimantan Province. This district consists of 11 villages (Tanjung Isuy, Pentat, Lempunah, Mancong, Muara Nayan, Muara Ohong, Perigiq, Tanjung Jone, Tanjung Jan, Pulau Lanting and Bekokong). Some villages were chosen as representative sites, such as Tanjung Isuy, Lempunah and Mancong. This

information was obtained in August 1999 by interviewing key and primary informants. The ethnobotanical information included on how the societies use the medicinal plants from surrounding vegetation for their daily life, their perception and conception of healthy and sickness, etc. The interviews were unstructured, open-ended discussion of the medicinal plants used as traditional medicine and their concept of environment awareness, especially for medicinal plants conservation. Key-informants within societies were interviewed in order to get general view concerning medicinal plants diversity, healing, practices, and dose. Then member of societies as primary source confirmed this information. The key-informants, generally, are highly respected, high status within the societies, and knowledgeable, for example: the healers, chief of societies, elders, etc.

Based on the information obtained from both sources, the ethnobotanical activities and their usage in healing were noted. Several questions concerning the medicinal plants were addressed; what the vernacular name of plant, is where it is collected, which part of plant is used as a medicine, how to use it and what its uses is. Herbarium specimens were made in the field, then were identified in Herbarium Bogoriense, Botany Division, Research Center for Biology – LIPI, Bogor.

RESULT AND DISCUSSION

A. Benuaq Society

Benuaq society is one of the Dayak ethnics inhabiting Kalimantan Island. They spread over in some district regions in West Kutai, i.e. district of Muara Lawa, Muara Muntai, Muara Wahau and Jempang. Benuaq society lives in one area, which consists of forest, farm and settlement area.

The major societies, live in Jempang, are Dayak Tunjung, Bugis and Dayak Benuaq. Dayak Benuaq came from Center of Kalimantan and majority live in Jempang. The Dayak Benuaq society moved to Nyuatan River at *Sentau*. The name of *Sentau* based on their village name where they came from. From Sentau they spread out to Mancong and Tanjung Isuy village, which are located in Jempang. Both villages are next to district of Muara Muntai, Ohong and Lamin Prigi villages. Other groups of Dayak Benuaq society moved to Idan River at sub district Muara Wahau (Anonim, 1984).

The major occupations of Benuaq society are having paddy cultivation and extractivism of forest product, i.e rattan, catching fish in river, making matting (for example hat, statue) and weaving. The major home industry is traditional weave, made from *doyo* leaves (*Curculigo latifolia*), namely 'ulap doyo' cloth. This cloth is in the form of long cloth.

In this district there are some *lamin* (long house) in Tanjung Isuy and Mancong villages and it is as a tourism place, where Benuaq society performs their culture, for example ceremony of disease healing (*balian*). It is usually showed in their performance while they sell their handicraft masterpiece, i.e statue and weave.

The Benuaq healers who perform ritual dances and music, as a part of the treatment, have attracted tourists to visit East Kalimantan. Those facts seem to have a

positive effect on the confidence of the members of the ethnic group. But some outsiders who are followers of imported religious are quite cynical about these practices.

The Benuaq healers are supposed to use black magic, worship and utilize spiritual way to cure people. Some young medical doctors oppose the practice, which is supposed to be only superstitious, hocus-pocus and relying on the pagan system of belief. Many members of the Benuaq consider that the existence of the balian is still important, because the institutions provided by the government can solve not all problems. The practice of traditional healing by the Benuaq is encouraged by the local authority, because of its ritual attractiveness to foreigners (Boedihartono, 1997).

In daily life, they use existing plant in surrounding area as medicinal herbs. Eventhough Puskesmas (The Public Health Clinics) is available in district, but medicinal herbs are also used to cure the diseases. However, they often invite '*balian*' from outside village to help them to recover their diseases if both doctor and medicinal herbs fail to recover their ill.

B. Local perception

The definition of 'healthy' by Benuaq society is not different from other societies. Healthy by their definition is condition when body in good health, so they can do their obligation without experiencing of trouble meaning.

This chapter try to know another aspect of traditional medication in order to answer several questions, i.e. does medication in Benuaq society only have superstition base to magic, does the usage of plant resource in the medication related with their believe, and does healing process in their medication in line with the way of conducted healing by modern medication (by doctor), and others.

Based on the result of the study, it shows that the way of medication of Benuaq societies very diverse. It means that medication of Benuaq society has character of magic such as those which done by all *balians*. In medication, all *balians* call ancestor soul denominating ritual to get the right way of medication. Then balian will make drug ingredients which consist of various plant species and other materials. There is also the way of medication done by society based on knowledge of its ancestor. Besides using ingredient of some plant species, it also has to accompany with usage of supertitous formula which only known by one who inherits the medication science from its ancestor.

More advanced way conducted by Dayak Benuaq society is medication by using ingredient of some plant species. It is accompanied by the dose of usage, which has been determined, for example drinking 1 glass 3 times one day during 3 days successively. The way of medication sometimes is not accompanied by superstitious formula or other ritual.

In general, the way of traditional medication of natural Benuaq society has changed along with the new life style and religion coming from outside. One example of the changes is that the traditional medication is put behind, and it is replaced by modern medication using synthetic medicines.

C. Diversity of medicinal plant and practice

Dayak Benuaq people live at some villages, such as Tanjung Isuy, Mancong and Lempunah. To support their daily life, they use plants from surrounding areas either as a food or as natural drug sources. Approximately, 60 plant species belonging to 55 genera and 31 families have been used as traditional medicine (Table 1). The three biggest families have mostly been used as drug resources are Euphorbiaceae, Fabaceae and Zingiberaceae. All those plants are able to recover 38 kinds of diseases that normally occur in the local people. Nine species can be used as a post pregnancy medicine and six species are as stomachache medicine. Furthermore, 7 species are as cosmetics, such as face powder and anti acne. Some plants among 60 species can be used both as insecticide and as fish poison.

Table 1 presents a list of plant used as medicinal plants, and one of them, *ketikong* (*Fibraurea tinctoria*) Loureiro, is considered as endangered plant species (Mogea *et al*, 2001).

Table 1. List of plants used as medicinal plants by Dayak Benuaq society, Jempang District, West Kutai, East Kalimantan.

No	Vernacular name	Scientific name Species - Family	Part of plant	Uses
1.	Bakung	*Crinum asiaticum* L. Amaryllidaceae	Leaves	Wrap for swollen
2.	Bekakang	*Melastoma affine* L. Melastomataceae	Leaves, root tip of leaves	Leaves and root boiled or take a bath for tonics, tip of leaves drunk for cough, stomachache
3.	Bekangin	*Alphitonia incana* (Roxb.) Hats. Rhamnaceae	Leaves	Crushed with water for itch; and balian ceremony
4.	Belolak	*Eleusine indica* L. Poaceae	Root, tip of leaves	Boiled and drunk, & put on the stomach
5.	Bemat	*Phrynium* sp. Maranthaceae	Tuber	Mixed bemat shoot rasped and turmeric for children pain
6.	Beribit tolak	*Centhoteca lappacea* (L.) Desv Poaceae	Tip of leaves	Mixed with face powder for anti acne
7.	Biawo nayu'	*Cordyline fruticosa* Back. Liliaceae	Stem	Balian ceremony; Mixed *biawo nayu'* leaves and oil grind for unconscious person
8.	Bilep	*Pogostemon heyneanus* Bth. Lamiaceae	Leaves	Mix with face powder
9.	Demeley / bengle	*Zingiber purpureum* Rosc. Zingiberaceae	Shoot	Applied for baby and adult
10.	Dermanuk / pasak bumi	*Eurycoma longifolia* Jack Simarubaceae	Root	Boiled or fill in the water then drunk for stomachache, diarrhea, backache

11.	Gede suli'	*Hedychium ery-throstemon* K.Sch. Zingiberaceae	Tuber	Stomachache
12.	Gerengang	*Cassia alata* L. Fabaceae	Leaves	Crushed then applied for itch, ringworm
13.	Gerik belana	*Jatropha curcas* L. Euphorbiaceae	Latex of leaves	Put in mouth for tropical sprue
14.	Gudu' bia'	*Fagraea racemosa* Jack ex Wall. Loganiaceae	Leaves, root	Post pregnancy
15.	Jamu/ jambu	*Psidium guajava* L. Myrtaceae	Root, tip of leaves	Boiled for dysentery
16.	Jekari/ luwe'	*Dianella nemorosa* Lam Liliaceae	Tuber	Grill for *balian* ceremony
17.	Jemo'	*Vatica dulitensis* Symington Dipterocarpaceae	Leaves	Crushed for swollen
18.	Kayu singah / pengramai	*Styrax paralleloneurum* Perk. Styracaceae	Stem	*Balian* ceremony
19.	Kelahang	*Aerva sanguinolenta* Bl. Amaranthaceae	Leaves, root	Boiled and drunk during menstruation
20.	Kembang kebun	*Graptophyllum pictum* (L.) Griff.	Root	Fill in the hot water then drunk for dysentery
21.	Kembang mekau	*Eupatorium triplinerve* Vahl Asteraceae	Leaves	Crushed and applied in the body; mixed with leaves of selasih for face powder
22.	Kemudi patah	*Pedilanthus tithymaloides* Euphorbiaceae	Stem	Crushed then applied for sprains
23.	Kerehau	*Callicarpa longifolia* Verbenaceae	Leaves, branch	Post pregnancy (Mixed *kerehau* and turmeric, betel leaves), or mixed egg (yolk of egg)
24.	Ketikong/ akar kunyit	*Fibraurea tinctoria* Loureiro Menispermaceae	Stem	Fill in the water then drunk for backache, mixed with root of *dermanuk* + water of *lahang* for healthy (vitamine)
25.	Klokop akar	*Phanera semibifida* (Roxb.) Bth. Fabaceae	Root Leaves	Root boiled and drunk especially for post pregnancy. This plant mixed with *gudu' bia'* and *kerehau.* Leaves fill in the water then drunk for vomit
26.	Komat bura'/ putih	*Justicia gendarussa* L. Acanthaceae	Leaves	Mixed *komat bura'* and turmeric, onion, candle nut tree then crushed for measles, fever, baby remedy; Mixed komat bura' with face powder for anti acne

27.	Komat metap / hitam	*Justicia gendarussa* L. Acanthaceae	Leaves	Crushed then applied in the body; mixed with turmeric for measles
28.	Komat sira'	*Justicia gendarussa* L. Acanthaceae	Leaves	Itch; mixed turmeric for measles Crushed then applied for head balm
29.	Kunyit	*Curcuma longa* L. Zingiberaceae	Tuber	Mixed with tip of *kerehau* leaves and betel leaves, for post pregnancy
30.	Langsat	*Lansium domesticum* Corr. Meliaceae	Bark	Boiled and drunk for anti malaria
31.	Lerum	*Cnestis platantha* Griff. Connaraceae	Stem	± 5 cm fill in the water then drunk for birth control
32.	Loa'	*Antidesma phanerophlebium* Merr. Euphorbiaceae	Leaves	Serious diseases
33.	Loya' merah	*Zingiber officinale* Rosc. Var rubra Zingiberaceae	Tuber	Crushed then drunk until 40 days post pregnancy
34.	Loya'/ jahe	*Zingiber officinale* Rosc. Zingiberaceae	Tuber	Crushed then drunk until 40 days post pregnancy
35.	Lupang	Malvaceae	Root	Add root of *klokop* and boiled then drunk for headache
36.	Miq	*Blenchum orientale* Bl. Polypodiaceae	Leaves/ shoot	Swollen
37.	Mug	*Blumea balsamifera* (L.) DC Asteraceae	Leaves	Mixed with water for head balm for headache
38.	Mung melur / kayu sumpit	*Brucea javanica* (L.) Merr. Simarubaceae	Fruit	Grind and eat for stomachache
39.	Ngkahara	*Dillenia excelsa* (Jack) Gilg.Dilleniaceae	Stem	*Balian* ceremony
40.	Ntalakaw	*Polyscias scutellaria* (Burm.f.) Forst. Araliaceae	Leaves	Mix with face powder as anti acne
41.	Pangaraya / kelagit	*Spatholobus ferrugineus* (Zoll.) Bth.	Root/ stem	Fill in the water then drunk for malaria
42.	Pemadep	*Fissistigma* sp. Annonaceae	Tip of leaves Branch	Mixed with rice powder for itch / measles. This plant can be mixed with *tua' jaun*
43.	Penyawer / akar sampai	*Tinospora crispa* (L.) Hook.f. & Th. Menispermaceae	Stem	Fill in the water then drunk for malaria
44.	Perwali	*Cinnamomum porrectum* (Roxb) Kosterm. Lauraceae	Leaves	Put in rice storage for insect repellent
45.	Pisak	*Fordia splendidissima* Bl. Fabaceae	Leaves, bark	Crushed for wound

46.	Pohon jatus pengerunu	*Codiaeum variegatum* (L.) Bl. Euphorbiaceae	Branch	*Balian* ceremony
47.	Rasun iwey	*Hyptis brevipes* Poit	Stem	Cut and fill in hot water then drunk for cough
48.	Sapan	*Caesalpinia sappan* L. Fabaceae	Bark	Stomachache
49.	Selokop	*Lepisanthes amoena* (Hassk.) Leenh. Sapindaceae	Young leaves	Crushed for face powder
50.	Seruga	*Kalanchoe pinnata* (Lam.) Pers. Crassulaceae	Leaves	boiled (to steam) for bone pain ; crushed leaves for tonics
51.	Sirih	*Piper betle* L. Piperaceae	Leaves	Post pregnancy
52.	Telasih	*Ocimum basilicum* L. Lamiaceae	Root	Mixed with powder then applied in cheek for toothache
53.	Tempora	*Ageratum conyzoides* L. .Asteraceae	Leaves/ root	Boiled and drunk for post pregnancy
54.	Tenggelimas	*Alpinia glabra* Zingiberaceae	Shoot	Fill in the water for eyeness for baby
55.	Tua' buah	*Croton tiglium* L. Euphorbiaceae	Tip of leaves/ Root	Itch
56.	Tua' jaun	*Derris caudata* Back. Fabaceae	Tip of leaves	Itch
57.	Tua' wakai	*Derris elliptica* (Wall.) Benth Fabaceae	Root	Grinded as fish poison
58.	Tuk tawai	*Costus speciosus* (Koenig) Smith Zingiberaceae	Stem	Crushed *tuk tawai* stem and water for cough, fill in the water for eyes
59.	Tungkai	-	Leaves	Excema
60.	Wangun	*Clausena excavata* Burm.f. Rutaceae	Leaves	Influenza
61.	-	*Phyllanthus fraternus* Webster Euphorbiaceae	Leaves, root	For tonics, after dried then mixed face powder for anti acne
62.	-	*Urena lobata* L. Malvaceae	Leaves, root	Tonics

Common medicinal plants used by Dayak Benuaq society are *dermanuk/pasak bumi* (*Eurycoma longifolia* Jack), *mung melur* (*Brucea javanica* (L.) Merr.), *penyawer/ akar sampai* (*Tinospora crispa* (L.) Hook.f. & Th.), *ketikong / akar kunyit* (*Fibraurea tinctoria* Loureiro) and *kerehau* (*Callicarpa longifolia* Lam.). Some of them are found wildly in the forest whereas the

others are cultivated in the surrounding villages. Medicinal plants commonly grow wildly and can be found now as cultivated plants in Tanjung Isuy and Lempunah village. They are mung melur, kerehau and penyawer. Some plants usually have several uses not only as medicinal plants, but also as ornamental plants, i.e. *komat metap*, *komat bura'*, *komat sira'* (*Justicia gendarussa* L.), *mekau* (*Eupatorium triplinerve* Vahl.) and *telasih* (*Ocimum basilicum* L.).

Very bitter fruit of 'mung melur' can be used as stomachache and it is also used as diarrhea, chronic dysentery and fever in China (Perry & Metzger; 1980; Hutapea et et al, 1993). This plant contains of bruselin that has anti amoeba effect compound (Pramono, 1995). In Jempang, root of *dermanuk* (*Eurycoma longifolia*), can be used as stomachache, diarrhea and lower back pain, and it is as bitter as fruit of mung melur from *Simaroubaceae.*

Stem of *lerum* (*Cnestis platantha*) can be used for birth control whereas Ong (2003) said that seed and stem of this *Cnestis* contains of poison compound. Furthermore in Malaysia, *C. palala* (Lour.) Merr. can be drunk as stomachache, diuretic medicine problem by boiling its root and in Laos its root can be used as anti dysentery.

Root and leaves of *kelabang* (*Aerva sanguinolenta*) are boiled and drunk for menstruation medication. Bunyapraphatsara & Lemmens (1999) said that this plant is also used as menstruation medication.

Kutai people, who live near Jempang at the Kenohan district, Kutai also used plant as traditional medicine and about 19 species are similar to those plants as in Jempang district. There are 7 plants species can be used for cosmetic as face powder or anti acne, such as *selokop* (*Lepisanthes amoena*), *bilep* (*Pogostemon heyneanus*) and *ntalakaw* (*Polyscias scutellaria*). Whereas 8 plants species have been used by local people at Kenohan as face powder, i.e. *bangkal* (*Adina minutiflora*), *hidup anak* (*Schefflera elliptica*), *tegoran* (*Crateva religiosa*) and *tabat barito* (*Ficus deltoidea*) (Setyowati *et al.*, 1995).

Melalatoa (1995) states that Benuaq women take care of their body based on their own traditional knowledge. They use 'jamu' which consists of ginger, leaves of '*kerehau*', leaves of '*muk*', galangal and turmeric. Mixed of those plants can be used as body refreshment, great muscle and anti odour. Leaves of '*langir wakai*' can be used to take care of her body, especially for anti odour. Whereas face powder can be gotten by grinding some ingredients, such as rice, *kaca piring* flower, rose flower, *kemboja*, *tendi* tree, *neraseh* and leaves of *tempesa'*. Those plants have specific scent aroma. Other special face powder by mixing of yellow betel leaves can be harvested on Friday morning when the sun comes out.

Based on Melalatoa (1995), study as in sub district Jempang, *selokop* (*Lepisanthes amoena*) can be used as anti acne and they also use '*bekangin*'. Furthermore, water from scrap leaves of *bekangin* can be used for curing itchy in sub district Jempang.

Dayak Benuaq society has known Balian ceremony, which is a kind of ceremony for curing diseases. Family of suffered person will conduct this ceremony if traditional medication effort does not succeed. During Baliatn ceremony certain things will be prepared, i.e pig, chicken, rice and gluten rice. Several plants will be used in this ceremony, i.e young leaves of cocos (*Cocos nucifera* L.), bamboo, inflorescens of betel nut (*Areca catechu* L.), *luwe'/jikari* (*Dianella nemorosa* Lam.), and *jatus* branch (*Codiaeum variegatum* (L.) Blume).

The traditional healer plays a role of great importance to the men (more attached to nature society). The Benuaq healers who perform ritual dances and music as part of the treatment have attracted tourists to East Kalimantan. Those facts seems to have a positive

effect on the confidence of the members of the ethnic group. But some outsiders who are followers of imported religions are quite cynical about these practices.

Local people also believe that at the legend or myth that some plants can be used for defending devil such as *Galeria filiformis* (Blume) Pax. Some certain places where traditional ceremony is held, can be found in Lempunah village, Muara Nayan village and Pentat village.

The highest number of plant species is employed as medicinal plants primarily for healing skin infections (14 species), followed by gastrointestinal (10 species) and reproductive (7 species). Table 2 shows the number of plant species and their utilization for healing diseases.

Table 2. Number of species related to the each kind of disease

No.	Kind of diseases	Number of species
1.	Skin: itch, wound, ringworm, excema, ulcer, swollen, measles	14
2.	Gastrointestinal: stomachache, dysentery, diarrhea, menstruation	10
3.	Reproductive: post pregnancy	7
4.	Cosmetic: face powder, anti acne	7
5.	Ritual: baliatn	6
6.	Tonics for general health	5
7.	Nervous system: fever, aches	5
8.	Orthopedic: backache, sprains	4
9.	Systemic: malaria, serious diseases	4
10.	Pediatric	3
11.	Respiratory: cough	3
12.	Headache	2
13.	Eye infections	2
14.	Poison: fish poison, insect repellent	2
15.	Toothache	1
16.	Vomiting	1
17.	Birth control	1
18.	Venereal diseases	1

D. Chemical properties

Chemical compound of species which has been employed as medicinal herbs by Dayak Benuaq society has been known (Table 3.). Fruit, bark and leaves of *mung melur* (*Brucea javanica*) contains saponins and leaves of *komat metap* (*Justicia gendarussa*) contains alkaloids, saponins, flavonoids and tannins. Leaves and fruit of *tua'* buah (*Croton tiglium*) contains saponins and leaves also contains alkaloids and polyphenol.

Table 3. Chemical compound of the medicinal plants

No	Local Name	Scientific Name	Part of plant	Chemical compound
1.	Bakung	*Crinum asiaticum* L. Amaryllidaceae	Leaves	Root and leaves contains: alkaloids, saponin, flavonoids and polyphenol Fruit contains: saponin, flavonoids and tannins
2.	Bekakang	*Melastoma affine* L. Melastomataceae	Leaves, root tip of leaves	Leaves contains : saponin, flavonoid and tannins
3.	Belolak	*Eleusine indica* L. Poaceae	Root, tip of leaves	Herb contains: saponin, tannins and polyphenol
4.	Biawo nayu'	*Cordyline fruticosa* Back. Liliaceae	Stem	Leaves contains: saponin, flavonoids and polyphenol
5.	Bilep	*Pogostemon heyneanus* Bth. Lamiaceae	Leaves	(G) Leaves contains: saponin, flavonoids and essential oil
6.	Demeley / bengle	*Zingiber purpureum* Rosc. Zingiberaceae	Shoot	Rhizome contains: saponin, flavonoids and essential oil
7.	Dermanuk /pasak bumi	*Eurycoma longifolia* Jack Simarubaceae	Root	saponin, eurikomalakton, sterol
8.	Gede suli'	*Hedychium erythrostemon* K.Sch. Zingiberaceae	Tuber	(G) Fruit contains: saponin, flavonoids, polyphenol and essential oil
9.	Gerengang	*Cassia alata* L. Fabaceae	Leaves	Leaves contains: alkaloids, saponin, flavonoids, tannins and antrakinon
10.	Gerik belana	*Jatropha curcas* L. Euphorbiaceae	Getah daun	Leaves and stem contains: saponin, flavonoids and polyphenol Leaves contains: tannins
11.	Jamu/ jambu	*Psidium guajava* L. Myrtaceae	Root, tip of leaves	Leaves and bark contains: saponin, flavonoids and tannins Leaves contains: essential oil
12.	Kayu singah / pengramai	*Styrax paralle-loneurum* Perk. Styracaceae	Stem	(G) Leaves, bark and root contains: saponin, flavonoids and polyphenol
13.	Kelahang	*Aerva sanguinolenta* Bl. Amaranthaceae	Leaves, root	Leaves and root contains: saponin, flavonoid and polyphenol Leaves contains: essential oil
14.	Kembang kebun	*Graptophyllum pictum* (L.) Griff.	Root	Leaves contains: saponin, flavonoids and tannins
15.	Kembang mekau	*Eupatorium triplinerve* Vahl Asteraceae	Leaves	Leaves and root contains: saponin, flavonoids and polyphenol Leaves contains: essential oil
16.	Komat metap / hitam	*Justicia gendarussa* L. Acanthaceae	Leaves	Leaves contains: alkaloids, saponin, flavonoids and tannins

17.	Kunyit	*Curcuma longa* L. Zingiberaceae	Tuber	Rhizome contains: saponin, flavonoids, polyphenol and essential oil
18.	Langsat	*Lansium domesticum* Corr. Meliaceae	Bark	Fruit contains: alkaloids, saponin, flavonoids and polyphenol
19.	Loa'	*Antidesma phanerophlebium* Merr. Euphorbiaceae	Leaves	(G) Leaves, bark and root contains: saponin and tannins Bark contains: flavonoids
20.	Loya'/ jahe	*Zingiber officinale* Rosc. Zingiberaceae	Tuber	Rhizome contains: flavonoids, polyphenol and essential oil
21.	Mug	*Blumea balsamifera* (L.) DC Asteraceae	Leaves	Leaves and bark contains: alkaloids Leaves contains: tannins and essential oil Bark and root contains: saponin Root contains: polyphenol
22.	Mung melur / kayu sumpit	*Brucea javanica* (L.) Merr. Simarubaceae	Fruit	Fruit, bark and leaves contains: saponin Fruit and leaves contains: tannins Fruit contains: polyphenol
23.	Ngkahara	*Dillenia excelsa* (Jack) Gilg.Dilleniaceae	Stem	(G) Leaves, fruit and bark contains: saponin and flavonoids Leaves and bark contains: polyphenol Fruit contains: tannins
24.	Penyawer / aka.r sampai	*Tinospora crispa* (L.) Hook.f. & Th. Menispermaceae	Stem	Leaves and stem contains: alkaloids, saponin and tannins Stem contains: flavonoids
25.	Pohon jatus pengerunu	*Codiaeum variegatum* (L.) Bl. Euphorbiaceae	Branch	Leaves contains: saponin, flavonoids and polyphenol
26.	Rasun iwey	*Hyptis brevipes* Poit	Stem	(G) Leaves and stem contains: saponin and tannins
27.	Sapan	*Caesalpinia sappan* L. Fabaceae	bark	Leaves and stem contains: saponin and flavonoids Leaves contains: polyphenol Stem contains: tannins
28.	Sirih	*Piper betle* L. Piperaceae	Leaves	Leaves contains: saponin, flavonoids, polyphenol and essential oil
29.	Telasih	*Ocimum basilicum* L. Lamiaceae	Root	Leaves contains: saponin, flavonoids, tannins and essential oil Seed contains: saponin, flavonoids and polyphenol
30.	Tempora	*Ageratum conyzoides* L. Asteraceae	Leaves/ root	Leaves and fruit contains: saponin, flavonoids and polyphenol Leaves contains: essential oil

31.	Tenggelimas	*Alpinia glabra* Zingiberaceae	Shoot	(G) Rhizome contains: saponin, flavonoids, polyphenol and essential oil
32.	Tua' buah	*Croton tiglium* L. Euphorbiaceae	Tip of leaves/ Root	Leaves and fruit contains: saponin Leaves: alkaloids and polyphenol
33.	Tua' wakai	*Derris elliptica* (Wall.) Benth Fabaceae	Root	Root contains: alkaloids, saponin, flavonoids, tannins and polyphenol
34.	Tuk tawai	*Costus speciosus* (Koenig) Smith Zingiberaceae	Stem	Leaves, stem and rhizome contains: saponin, flavonoids and tannins Fruit contains: saponin, flavonoids and polyphenol Rhizome contains: alkaloids
35.	Wangun	*Clausena exavata* Burm.f. Rutaceae	Leaves	Leaves contains: saponin, flavonoids and tannins
36.	-	*Phyllanthus fraternus* Webster Euphorbiaceae	Leaves, root	Herb contains: saponin, flavonoids and polyphenol
37.	-	*Urena lobata* L. Malvaceae	Leaves, root	Leaves, root and fruit contains: saponin and flavonoids Leaves and fruit contains: tannins Leaves contains: essential oil

Chemical compound of species which has been utilized as medicinal herbs by Dayak Benuaq society (Table 3) can be used for further research by phytochemical researcher. It is expected that derivative compound which can heal disease, can be produced from this study. Some important plant species which can be developed are *Antidesma phanerophlebium, Fagraea racemosa* and *Cnestis platantha.*

CONCLUSIONS

Based on indigenous knowledge of Dayak Benuaq society at Jempang district, West Kutai, East Kalimantan, 60 plant species belong to 55 genera and 31 families are recorded as medicinal plants. These plants have been used traditionally for curing 38 diseases and for *balian* ceremony as well. Some of plants have been already cultivated such as *mung melur* (*Brucea javanica* (L.) Merr.), *penyawer/ akar sampai* (*Tinospora crispa* (L.) Hook.f. & Th.), and *kerehau* (*Callicarpa longifolia* Lam.).

Traditional medication of Dayak Benuaq society has been degraded from all parties especially entry of new cultural influence like new belief, education, new life style and others. Local knowledge will disappear along with intensively of the new cultural pressure. While that local knowledge has not been documented yet and proved scientifically. So that local knowledge which is possible good for medication in the future will disappear before it has been documented furthermore. Besides that the government has not yet supported fully, the effort to document and study of the local knowledge.

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