

Ethnomedicine of Dayak Paramasan Ethnic in the Meratus Mountains (part-1): The Medicinal Plants for Diarrhea and Respiratory Disorder

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ABSTRACT

Babalian ethnomedicine was used in solving several diseases which were suffered by the people of Dayak Paramasan Meratus Mountain, Banjar-South Kalimantan. This phenomenon could be known at the treatment of infectious disease such as respiratory disorder and diarrhea which had high prevalence. Moreover, this journal focused on exploring the use of herbs that they had used. Thirty respondents consisted of 21 male and 9 female were systematically selected by informants including traditional herbalists (key informants) who participated in the study. Semi-structured interviews, discussions, and guide of field walk constituted the methods of data collection. Medicinal plant specimens were collected, identified, and kept at a plant conservation hall of Purwodadi botanical garden-LIPI, Lawang, East Java. A total of 28 traditional medicinal plant species against respiratory tractus disorder and diarrhea in 21 genera and 21 Families were recorded. 12 species had been identified the phytochemical from several studies and showed the pharmacological effect that supported empirical usage in Babalian ethnomedicine. Such documentation of comprehensive ethnomedicinal knowledge was very valuable and needed to be scaled-up so that it could be followed up with phytochemical and pharmacological analysis in order to give scientific ground to the ethnomedicinal knowledge.

KEYWORDS: medicinal plant, diarrhea, respiratory disorder

INTRODUCTION

Indonesia has high biodiversity level in the world which is in the third place of ten countries that have the biggest mega biodiversity in the world. In addition, it places 1,3% of wide surface of earth, but it places 17% from all species in the world. The mega biodiversity provides many medical plant species that have potency as raw material of medicine. Most of the medical plant species can be found either in the inside or outside of the various forests in Indonesia with the characteristic of specific habitat in every landscape that is owned. The information of the medical plant usage can be obtained from the society or indigenous people. Moreover, this information is very important for the medicine development because there are many plant extracts which are used for modern medicine that is found through this approach^{1,2}.

The preliminary survey in last December 2014 in Paramasan Bawah village which became the location as the subject of the study was found that the disease types in high prevalence by referencing basic research health data (Riskesda) in 2010 were diarrhea in 10% (national average in 9%), respiratory disorder in 28 % (national average in 25,5%). In an effort of prevention the disease, the indigenous people still depended on their own traditional medicine system that was known as Babalian. Since 2008, Paramasan area had had a Public Health Center that was built by government in order to increase the effort of people's health. Moreover, this Public Health Center seemed to still use Babalian ethnomedicinal method.

How Babalian ethnomedicine was able to give treatment for infectious disease such as respiratory disorder and diarrhea was very interesting phenomena that was the background of this study. As we know that, a treatment for cases of infection needed certain antibiotics. Furthermore, this study was begun by searching an overview of Babalian ethnomedicine regarding a philosophy and method of treatment for the disease. The result of the study would be made in two journals that each of them focused on two unsure of Babalian ethnomedicine. Those unsure were about the aspect of the use of herbs as the medicine (part-1) and the aspect of Babalian healing ceremony (part-2). In addition, this journal was focused on the unsure of the use of natural medicine for the treatment of respiratory disorder and diarrhea.

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2. METHODS

2.1. Interview

A semi-structure interview was chosen because it had possibility to collect freely some relevant important questions for each medicinal plant. The semi-structure interview was done along the trip in the forest while collecting the medicinal medicine as the sample for obtaining description about: Why it was happened a disease (etiology disease) based on Babalian ethnomedicine; How the process of the treatment was done; How was the role of medicinal plants in the process of the treatment; The estimation of Babalian about the origin of the use of the plants; and how the knowledge about it was obtained and inherited. Furthermore, all of the interviews were recorded in audio recorder with the permission from the respondents.

2.2. Study Area

The ethnicity of Dayak Paramasan Meratus placed in area of Paramasan sub-district, Banjar district. The geographical position was on 03 degree of 08'49" South Latitude - 03 degree of 43'38" South Latitude and 115 degree of 22'30" East Longitude - 115 degree of 35' 37 East Longitude with the width of 560,85 km² and the geographical position was located in Meratus Mountain. In addition, the number of the people was 3.592 people with the population density was 6 people / Km which were consisted of four villages which were Paramasan Bawah village, Paramasan Atas village, Remo village, and Angkipih village. Their livelihoods were farming and panning the gold. Most of them lived in under the poverty line, 90 % of the people were illiteracy. The distance between their house and the capital of Banjar (Martapura) was 168 Km. The trip from Martapura to Paramasan district passed two districts which were Tapin and Hulu Sungai Selatan. Paramasan sub-district, Banjar, which was based on decree (SK) of Banjar regent No. 033 in 2009 on 23rd December 2009, was settled as a very primitive area.

The forest region in Meratus Mountain had soil types such as Ultisol, Inceptisol, latosol, and litosol. The data of rainfall in Meratus Mountain was not available well. However, the average total in a year for the high land was estimated high enough which was 4.000 mm, and it was showed by overflowing the sphagnum, epiphyte, no woody bushes, and herbs. The region of Meratus conservation was about 1.294 – 2.754 mm/year with the rainy season in October - May. The daily average of temperature was about 25,7°C - 7,1°C, meanwhile, the humidity was about 80% - 87%.

According to the height from the sea surface, most of protected forest of Meratus Mountain could be classified as a lower montane tropical rain forest. The dominant tree types werewhite Meranti (*Shorea*sp), red Meranti (*Shorea*sp), Agathis (*Agathis*sp), canary (*Canariumdandiculatum*BI), Kempas (*Koompassiasp*), maggots (*Quercussp*), Durian (*Duriosp*), *Gerunggang* (*Croloxylonarborescen*BI), *Nyato*h (*Palaquium*sp), and *Medang* (*Litseasp*).

The vegetation formation of Meratus Mountain region was divided by 2 categories which were "lower montane" (100 – 1000 m dpl) and "upper montane" (1000 – 1900 m dpl). From each categories had various habitat types and the vegetation of its composer. According to the formation of the vegetation composer, it could be classified in five types of main habitat. The types were: 1) the rain forest in the mountain that was the vegetation formation showed its biodiversity. It began being monotonous with the character of overflowing the algae on roots, twigs, and branches, even on the ground. The trees were also in small size and the height was not more than 15 meters, and their appearance began being similar due to the small number of the species. The formation was dominated by the species of Myrthaceae (*Eugenia sp*/Ruhut and Bahilayan) and Fagaceae (*Castanopsisspp* & *Lithocarpus spp.*). The algae types (*Spagnum*spp) and orchid (orchidace) were abundant. 2) The mixture hill forest: Dipterocarpaceae which was divided by two. They were Upper Mountain and Lower Mountain. Upper Mountain was a formation that was dominated by Dipterocarpaceae (*Shorea* and *Dipterocarpus*) that mixed with Fagaceae (*Castanopsis* and *Leptospermum*). The other families that supported this formation were Flacourticeae, and many others.

Meanwhile, the Lower Mountain was a formation that was dominated by Dipterocarpaceae that had bigger diameter (*Shorea*, *Dipterocarpus*, *Hopea*, *Anisoftera*, and the others) which mixed with the other families such as Anacardiaceae and Moraceae. The vegetation that based on the height from sea surface was mostly vegetation. The vegetation based on its height from sea surface which mostly was the group of protected forest in Meratus Mountain could be categorized as lower Montane Tropical Forest. The dominant tree species there were white Merant(*Shorea*sp), red Meranti (*Shorea*sp), Agathis (*Agathis*sp), canary (*Canarium* and *Diculatum* BI), *Nyato*h (*Palaquium*sp), *Medang* (*Litseasp*), Durian (*Duriosp*), *Gerunggang* (*Crotoxylonarborescen* BI), *Kempas* (*Koompassiasp*), maggots (*Quercussp*).

2.3. Documentation of Information and Medical Plants Collection

First visit to Paramasan Bawah village was done on 14th December 2014. We spread questionnaire to 30 respondents who were indigenous people of Paramasan Bawah village and they were 20 until 60 years old

that consisted of 70% male and 30% female regarding the medical plant species which they often used to treat respiratory tractus disorder (cough, asthma, acute infections, pneumonia, etc.) and diarrhea.

The information that was collected used questionnaire guide ⁴: The name of local plant; disease that could be treated by using the plant species (by describing the symptoms of the disease); Part of the plant that was used; Combination by using other plant species; The way on preparing simplicia supply; the estimation of giving dosage in a day; the long-use; Various restriction during the usage.

The second visit took place on 7th until 9th January 2015 for collecting the sample of medical plants which were obtained from the information result of the first visit. The plants were collected directly from indigenous habitat in Meratus Mountain. Along the way in the forest, we interviewed informant by utilizing semi structure interview technique. The informant was Mr. Uliansyah. He was a Balian (native healer) who was believed by local people in Paramasan Bawah village and who had authority due to the expertise, experience, and knowledge as a herbalist and healer. As a Balian (native healer), he was not only as a healer but also as a spiritual leader in traditional ceremony of Balian belief.

Furthermore, the medical plants which were collected were the plant collection which was used to heal respiratory disorder and diarrhea. The plant vouchers which were collected were identified in plant conservation hall of Purwodadi botanical garden-LIPI, Lawang, East Java.

3. RESULTS AND DISCUSSION

3.1 The Cause of the Disease

Babalian ethnomedicine described some diseases which were suffered by people as the impact of disharmony relation between human and environment. According to Balian philosophy, all natural environments had spirit and soul, hence, rock, mountain, river, plant, fire, and many others had each soul. The human could live peacefully if they could adapt and they could be accepted well by the environments (soul). If it was happened a disorder at this harmony, the human would receive some poisons which were from the soul such as anger, warning, even penalty for their own individual attitude. Each poison or disturbance from the soul was not specific to attack particular organ. However, there was a description that disturbance at the soft organ such as blood, gland, and mucosal tissue were usually caused by water soul. Meanwhile, the disturbance at muscle and bone were usually caused by rock and ground soul (continent and residence).

Furthermore, the focus of their attention to face the case of the disease was more on searching the causes that made the souls became angry, so that the souls made disturbances and the people also focused on how to neutralize them. In addition, the disease could be healed due to one of three conditions as follows: First, the souls that made a disease attracted back the poison that they released. This was because there was certain ceremony in which there were the unsure of apologizing and ritual offerings. The certain ceremony was known as healing ceremony. Second, there was natural energy that could neutralize the disturbances from the souls. Certain medicinal plants (*pelungsur*) were believed to have the energy that could neutralize the disturbances from the souls. Third, God's help (*Suvara*). Although, Balian spirituality believed to the power of ancestral souls, deities, natural souls which they respected, among all those powers, they believed to the highest power that became a cause of the existence in the universe. Besides, they also believed that due to God's permission, all poisons from the souls would be healed.

Around people of Dayak Meratus (hill) was known that there were three groups of souls who kept the residence. They were *Siasia Banua*, *Bubuhan Aing*, and *Kariau* which mostly related to the inshore area and now the inshore area was occupied by Banjar Hulu people and Banjar Kuala people. The examples of *Siasia Banua* were *Siasia Banua Kambat*; *Siasia Banua Pantai Batung*; and many others. The examples of *Bubuhan Aing* (water community) were *Bubuhan Aing Muhara Indan*; *Bubuhan Aing Danau Bacaramin*; *Bubuhan Aing Maantas*; and many others. Meanwhile, the examples of *Kariau* were *Kariau Labuhan*; *Kariau Padang Batung*; *Kariau Mantui* land many others.

3.2 Treatment

In the process of treating and healing, Babalian ethnomedicine had three phases of it. The first phase, the patient had felt the symptoms and felt painful at certain anatomic in the body, weak body, fever, and many others. In first phase, the patient came to the Balian and the patient would be checked by the Balian. In this phase, the treatment that was given such as reading a spell and certain prayer of healer and following by spouting the water that had been read the spell to the patient. Moreover, this process was known as *basambur*.

In second phase, if the pain had not disappeared after three days of first phase, the patient would be given herbs which were made from plants. These herbs were usually consisted of one or more plants which they prepared in a serving that was immersed in water. Based on Babalian ethnomedicine, these herbs were known as *pelungsur* (demolition). During the treatment of this *pelungsur*, Balian could add new concoction of this *pelungsur* in order to strengthened the old *pelungsur* even Balian could change the old *pelungsur*. This decision was taken by looking at the reaction of recovery response that was shown by the patient.

The third phase was Babalian ceremony. It was a ceremony that was held in order to heal the disease or in other word, the ceremony was known as *Baharagu* or *batandik*. The treatment that was continued to this phase was for certain disease which was difficult to be healed. The core of this Babalian (*baharagu*, *batandik*) was a request to the God as the controller and creator of this universe in order to decrease the power to neutralize the disturbances from negative souls. Furthermore, the ceremony was done in early evening until early morning (along the night).

3.3 Plants as A Component of Medical Treatment

In the philosophy of Babalian, the creation of plants was not only as food but also as detox which neutralized a wide range of natural disturbance of the human body. This neutralizing function took plants as a central system of Babalian Etnomedicine. Plants were placed as a substance which had a function as a toxin and pollutant removal of natural souls.

Parts of the plants which were used were leaves, stems and roots. The most commonly used was roots. It was around 80% of plants which were used as a concoction in toxin removal was root, while leaves were used in their various ceremonies. Plants could be used as toxin removal if they were prepared well with the special treatment from the process of picking until it was ready to be used in the healing process. If the special treatment in this process was not done, the function of toxin removal would fade.

In the process of making toxin removal, it had to be noted that the way in picking plants from the forest had to be done in the specific time. The best time in picking plants was around 12.30-13.00 when the sun moved from its highest point. Before picking the plants, the previous Balian would say a few spells that contained their purpose in using the plants as a herbal medicine of certain illness. It was said to *Suwarain* Banjar Arkais language that was the traditional Banjar language.

3.4 Medicinal Plant Diversity

There are 28 species which were used in the healing process of respiratory canal disorder and diarrhea. It consisted of 21 genus and 19 familia which were provided in the table-1. Each of Myrtaceae and Urticaceae familia had 2 species while the other familia had only 1 species. The parts of the plant which was used were roots (55%), leaves (23%), stems (16%), tuber (3%), and rind (3%).

Table 1 Medicinal plant families in the study area with the corresponding number of genera and species

Familia	Jumlah Genus	Jumlah Spesies
Annonaceae	1	1
Apocinaceae	1	1
Bombacaceae	1	1
Compositae	1	1
Dilleniaceae	1	1
Fabaceae	1	1
Leguminosae	1	1
Loganiaceae	1	1
Marantaceae	1	1
Melastomataceae	1	1
Menispermaceae	1	1
Myrtaceae	2	2
Ophioglossaceae	1	1
Piperaceae	1	1
Rutaceae	1	1
Sterculiaceae	1	1
Taccaceae	1	1
Urticaceae	2	2
Vitaceae	1	1

3.5 Treatment of Disease

Respiratory canal disorders which was known by Dayak Paramasa Ethnic are cough, atshma, flu, and phlegm. They divided this respiratory tractus disorder into two. Those were severe disease and ailment (mild disease). These two differences were divided according to the duration of disease and the condition of patient.

Mild respiratory canal disorder such as cough (with colds or influenza) was often treated with plants which werefound easily in the neighborhood. They were: *Taccasp*, *Clausena excavate*, *Tetra Cera sp.*, *Alstonia scholaris*, *Tinospora crispa*, *Helminthosstichys zeylanica*, *Melastoma malabathricum*. In this case, they used one plant only for herbs. In treating asthma, they used *Leucosyke capitelata wedd.*, *Donax caniformis*, *Tristanopsis sp.*, *Mucuna sp.*, *Dialium indium L.*, *Leea indica Merr.* They could use one plant only for herbs or mix them with one or a few other plants in accordance with the severity of the complaint.

In the case of the severe respiratory canal disorder, Balian used *pelungsur* that was a special herb made from a mixture of the following herbs: *Gumaring*, *Tulang kungkung*, *Kamuyang* and *Karatau*. The use of *Pelungsur* was usually followed by a Babalian's healing ceremony (*baharagu*, *batandik*).

Gastrointestinal disorders which were known by Paramasan Dayak Ethnic were stomachache, bloated, diarrhea, dysentery (bloody diarrhea), and gastritis. They divided gastrointestinal disorder into two types: severe illnesses and ailments. These differences were indicated by the length of illness suffered and the patient's condition.

Gastrointestinal disorders in the level of ailment such as diarrhea and stomachache were treated by the use of medicinal plants such as: *Blumea balsamifera*, *Spatholobus sanguineus*, *Sterculia sp.*, *Annona muricata*, *Fagraea racemosa*, *Durio zibethinus*, *Psidium guajava* and *Kayu Angin*. In the process of treatment, it was used a single plant or the combination of the plants above. Ulcer disease (gastritis, stomatitis) was treated by *Scleria laevis* Willd with one or more plants above. The treatment of dysentery (bloody diarrhea) used Bengkirai blood in its herb ingredients.

Severe gastrointestinal tract disease was treated by *pelungsur*: a mixture of these several plants: *Tawiya anggang*, *Sembilikan*, *Mampap*. *Pelungsur* usually followed by Babalian ceremony (*batandik*, *bahayaga*).

No	Local name	Species	Family	Uses	Part	Directions
1	Capa	<i>Blumea balsamifera</i> bc.	Compositae	Diarrhea	Folium	Drunk, outboard
2	Carikan darah	<i>Spatholobus sanguineus</i>	Urticaceae	Diarrhea, stomach	Root	grinded and brewed
3	Hiring	<i>Scleria laevis</i> Willd.	Piperaceae	Digestive, nausea	Leaf	chewed and swallowed
4	Tawia anggang *)	<i>Barringtonia</i> sp	Lecythidaceae	Diarrhea, stomach	Tuber roots	soaked and drink
5	Tampaisi	<i>Tacca</i> sp.	Taccaceae	Cough		Swallow
6	Nangka walanda	<i>Annona muricata</i>	Annonaceae	Diarrhea, stomach	Leaf	heated and taped
7	Gumaring **)	<i>Jasminum</i> sp	Oleaceae	colds and coughs	Root, folium	soak for drinking and bathing
8	Jajahi	<i>Leucosyke capitata</i> wedd.	Urticaceae	Astma	Root	soak and drink
9	Kamuyang **)	<i>Typhonium</i> sp	Araceae	Cough, cold, flu	Root	soak and drink
10	Bengkirai darah *)	<i>Colona</i> sp	Tiliaceae	Disentri	Root	soak and drink
11	Mingkudu hutan	<i>Fagraea racemosa</i>	Loganiaceae	Diarrhea	Root	soak and drink
12	Bamban hutan	<i>Donax caniformis</i>	Marantaceae	Astma	Lignum	soak and drink
13	Hampalas	<i>Tetracera</i> sp.	Dilleniaceae	Cough	Root	soak and drink
14	Palawan	<i>Tristanopsis</i> sp	Myrtaceae	Astma	Lignum	Soak and drink
15	Akar uulur	<i>Mucuna</i> sp.	Leguminosae	Astma	Root	Soak and drink
16	Sembilikan *)	<i>Sapotaceae</i> sp	Sapotaceae	Diarrhea, stomach	Root	Soak and drink
17	Durian	<i>Durio zibethinus</i>	Bombacaceae	Diarrhea	Cortices	Cocta, drink
18	Mampap *)	<i>Rubus</i> sp	Rosaceae	Diarrhea, stomach	Root	Soak and drink
19	Pulantan	<i>Alstonia scholaris</i>	Apocinaceae	Cough	Folium lignum	Soak and drink
20	Akar sampai	<i>Tinisporea crispa</i> (L.) mier exhaft	Menispermaceae	Cough	Root	Soak and drink
21	Rumput telunjuk langit	<i>Helminthostichys zeylanica</i>	Ophioglossaceae	Cough	Root	Soak and drink
22	Karatau **)	<i>Brucea</i> sp	Simaroubaceae	Cough, astma	Root	Soak and drink
23	Karamunting	<i>Melastoma malabathricum</i>	Melastomataceae	Cough	Root	Soak and drink
25	Kuranji	<i>Dialium indium</i> L	Fabaceae	Astma	Root	Soak and drink
26	Tulang kungkung **)	<i>Asystacia</i> sp	Acanthaceae	Cough, astma	Root	Soak and drink
27	Mamali	<i>Leea indica</i> Merr	Vitaceae	Astma	Root	Soak and drink
28	Jambu biji	<i>Psidium guajava</i>	Myrtaceae	Diarrhea	Cortex lignum, leaf	Soak and drink

*) Pelungsur for digestive disorders: abdominal pain, diarrhea, ulcers, etc. which is heavy.

**) Pelungsur for respiratory disorders: cough, runny nose, shortness of breath, etc. that are heavy

3.6 The Methods Used in the Preparation of Herbal Medicines

In the process of preparing the herbal ingredients, the method used was maceration (90%) that was cleaning the parts of plant which would be used and then, cutting them into pieces, putting them in hot water (water that had been boiled) and then waiting until it was cool. The plants were left submerged in water (maceration). This soaking water was used for drinking. If the soaking water had run out, it could be added some water again. This method was usually used for roots, stems, bark, and rind.

3.7 The Efficacy of the Herbal Remedies Used in the Traditional Medicine

There were 7 species of medicinal plants listed in the table-2 which were used in treating cough. Those were: *Tacca sp.*; *Tetracera sp.*; *Alstonia scholaris*; *Tinospora crispa* (L.) *mier exhaff*; *Helminthostachys zeylanica*; *Melastoma malabathricum*; *Jasminum sp.*; *Typhonium sp.*; *Brucea*; *Asytacia*. *Helminthostachys zeylanica*; *Tinospora crispa*; *Alstonia scholaris* and *Tetra cera sp.* had flavonoid substance which had antioxidant activity and anti-cancer activity in lungs' cell.

It was identified that there was a flavonoid with the Anti-inflammatory activity of *Helminthostachys zeylanica* Rhizome. New eight flavonoid of prenylate, ugonins, together with five known compounds, ugonins, 5,4'-dihydroxy-4'',4''-dimethyl-5''-methyl-5''H-dihydrofurano [2'',3'':6,7] flavanone, and quercetin, had been successfully isolated from *Helminthostachys zeylanica* Rhizome. Many of them showed inhibition of superoxide anion generation and elastase which were released by human neutrophils in responding the formyl-L-methionyl-L-leucyl-L-phenylalanine/cytochalasin B⁵. The analysis of the UV spectrum showed flavonoid as the isolated result from ethyl acetate fraction including flavones with ortho-OH system in ring B was at 30, 40 position. The test results of anticancer by bioassay against P388 murine cells showed IC 50 2,4µg / ml that meant the flavonoid was very active as anticancer.³⁷

Tinosporacrispa had a potential to be a source of natural antioxidants and nutrients, besides having a moderate anti-proliferative effect on selected human cancer cell lines⁶. Moreover, anticholinesterase inhibitory activity of quaternary Alkaloids was from *Tinospora crispa*⁷.

A combination of Alkaloids and Triterpenes of *Alstonia scholaris* (Linn.) R. Br. Left enhances immunomodulatory activity in C57BL/6 Mice and Induces Apoptosis in the A549 cell line. Their combination had a stronger activity than that of either class alone so that these components might be beneficial for the prevention and treatment²³. The experimental evidence that was given directly indicated that *Alstonia* had a significant anti-lung cancer activity *in vitro*⁹. *Alstonia* had been observed to possess chemo preventive, antioxidant, antimutagenic and immunomodulatory activities, all of which were properties efficacious for cancer or tumor treatment¹⁰.

Chemical investigations carried out with active extracts of different *Tetracera* species had reported mainly the isolation of flavonoids¹¹ and terpenoids¹² and studies had showed that some of these compounds possessed important biological activities^{12,13}. This study also showed that some extracts were effectively able to inhibit the formation of free radicals. Among the extracts tested, the best radical scavenging activities

Melastoma were herbs which were often used in the case of wet cough (expectorant) that was often accompanied by influenza. The most recent research on *Melastoma malabathricum* revealed that its bioactive constituents exhibited free radical scavenging activity and anti-inflammatory effects on mouse ear edema¹⁴, antibacterial effects against different strains of bacteria,^{15,16,17,18} effective anticoagulant activity¹⁹, it exhibited antiviral and cytotoxic effect against murine cell lines²⁰, and possessed anti nociceptive, anti-inflammatory, and antipyretic activities²¹ and the natural flavonoid and pentacyclic triterpenes isolated from it possessed anti-inflammatory effects.²² *Melastoma* was identified as having Immunomodulatory effect.¹⁵

Tacca sp had a function in preventing tissue damage and as an active antimicroba. Retro-dihydrochalcones which was isolated from *Tacca sp.* had been identified that it had a function as antiproliferative and microtubule⁸. The antifungal activity (MIC values) of methanolic extract of *C. excavata* against *T. rubrum* and *T. mentagrophytes* was found to be 62.5µg/ml and 31.2 µg/ml.

Plants were used for another respiratory disorder such as asthma and shortness of breath were: *Lea indica* and *Donax*. *Donax caniformis* was a potential candidate to be used as an antioxidant and antiproliferative agents²⁴ of phytochemical screening of the ethanolic extract. The preliminary phytochemical screening of the ethanolic extract of roots of *Lea indica* (Burm.f.) Merr revealed the presence of alkaloids, carbohydrates, steroids, triterpenoids, flavonoids, glycosides, anthraquinone glycosides, tannins, resins, and saponins. The chemical entities isolated and characterized include β -sitosterol, lupeol, di-n-octyl phthalate, β -amyrin, gallic acid, quercitrin, dibutylphthalate, and α -tocopherol²⁵. Anti-tumor properties of *L. indica* could be linked with the presence of these antioxidant and cytotoxic activity. These outcomes indicate the possible potential use of *L. indica* as anti-tumor agent²⁶.

The ingredients of *pelungsur* for cough consisted of: *Jasminum sp.*; *Typhonium sp.*; *Brucea sp.* and *Asystasia sp.*, *Asystasia gangetica* (A. gangetica) belonged to the family of Acanthaceae. It was used to treat hypertension, rheumatism, asthma, diabetes mellitus, and as an anthelmintic in South Africa, India, respectively. It had also been reported to inhibit the angiotensin converting enzyme (ACE) in-vitro and in-vivo.³⁷ The antimicrobial activity of *Asystasia* was screened. The methanol extract from *Asystasia gangetica* roots which were exhibited showed high antibacterial activity against some of the tested bacteria, with all the calculated MIC values greater than those of other extracts.³⁸ sensitivity gained *salmonella typhi* and *pseudomonas aeruginosa*³⁹. The isolation of the indole alkaloid canthin-6-one from *Brucea sp.* had been reported by some workers. The compound and its hydroxylated and methoxylated derivatives had demonstrated cytotoxic effect and marked activities against malaria, leukemia, carcinoma, keratinocytes of guinea-pig ear, and bacteria.^{40,41} The antibacterial and antioxidant activity of different extracts from of *Typhonium sp.* had been reported. *T.*

flagelliforme, was also used to provide relief in cough and asthma, which was experimentally verified that water, alcohol and ester extract could significantly decrease cough times, prolong asthma incubation period, decrease twisting times, inhibit ear swelling and decrease autonomic action times.⁴² The result of the ability of aqueous extracts of *Brucea* sp., *Typhonium* sp. had been published that was used to inhibit the proliferation of cancer cell lines originating from the oral mucosa.⁴³

Plants which were used in treating diarrhea were: *Annona muricata* ; *Blumea balsamifera* bc.; *Spatholobus sanguineus*; *Sterculia* sp.; *Fagraea racemosa*; *Durio zibethinus*; *Psidium guajava*. *Annona muricata* extract contained a wide spectrum of activity against a group of bacteria that was responsible for the most common bacterial diseases. Leaf extract of *Annona muricata* was used in the treatment of various bacterial infectious diseases such as pneumonia, diarrhea, urinary canal infection, and even some skin disease.^{27, 28}. Guava leaf tea of *Psidium guajava* Linnaeus was commonly used as a medicine against gastroenteritis and child diarrhea by those who could not afford or did not have access to antibiotics. *Flavonoid mixture, triterpenes* of *P. guajava* leaves showed good activity on *S. aureus* with MIC of 25 µg/ml^{30, 29}. *Blumea balsamifera* had antimicrobial activity^{31, 32}, radical-scavenging³³, and anti-obesity properties³⁴. The main active compound was L-borneol, which was characterized by a high volatility. Besides, essential oils, flavonoids, and terpenoids with several different biological activities were also reported³⁵. These studies could explain why this plant had multiple pharmacological effects.

Conclusion

Babalian's Ethnomedicine derived from belief, value and religion of Paramasan Dayak in Meratus Mountain. It was concluded from two elements of Babalian Ethnomedicine which was related each other. The first one was the use of herb and the healing ceremony. The use of herb was understood as detoxification of negative influence of natural soul which attacked the patient. The ceremonial properties were used in order to ask to the highest force to remove and neutralize the disturbances from the souls. .

From the previous research on medicinal plants, it was proven that plants had a phytochemical and pharmacologic function which had an empiric use of treating respiratory canal disorder such as: *Tacca* sp.; *Clausena excavate* Burm f.; *Tetracera* sp.; *Alstonia scholaris*; *Tinospora crispa* (L.) mierschaff; *Helminthostichys zeylanica*; *Melastoma malabathricum*. Plants family of *Helminthostichys zeylanica*; *Tinospora crispa*; *Alstonia scholaris* and *Tetracera* sp., plants family of *Annona muricata*; *Blumea balsamifera* and *Psidium guajava* were also proven that it had a substance that had a function as medicine in treating indigestion and diarrhea.

For the next research. It is necessary to preserve this indigenous knowledge on traditional medicine by proper documentation, identification of plant species, herbal preparation, and dosage of another illness. In addition, it should be followed by phytochemical and pharmacological analyses in order to give scientific ground in the ethnomedicinal knowledge.

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