LOCAL ETHNIC MALAY COMMUNITY KNOWLEDGE IN TRADITIONAL MEDICINE UTILIZATION AND ITS CONSERVATION STRATEGY IN EAST BELITUNG REGENCY, INDONESIA

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ABSTRACT

Belitung Malay is the largest ethnic group in the East Belitung Regency which is rich in biodiversity. In daily life, the people of East Belitung utilize biological resources for various necessities of life, including the utilization for health maintenance and treatment. However, along with the changing times and technological developments in the health sector, there are some changes in society in the use of biodiversity as traditional medicine. This study aims to examine the knowledge and perceptions of the Belitung Malay ethnic community on the use of traditional medicines. The method used in this study is a semi-structured interview with ethnographic techniques. Informants were selected using purposive sampling, in which they were considered to have a lot of knowledge about traditional medicine and its processing, such as traditional leaders, tribal chiefs, village heads, herbalists, and massage workers. The data were analyzed using descriptive analysis. The results of the interview show that people still use traditional medicine a lot. Traditional medicine is sourced from plant and animal raw materials. Community trust in traditional medicines is still quite high as indicated in the use of medicinal plants based on use values reaching 0.64 and animal-sourced traditional medicines of 92.59. Even though the use-value is high for the Malay ethnic community, it seems that the existence of traditional medicinal materials has become increasingly difficult and scarce to obtain. In this case, to obtain these medicinal ingredients, people must go far into the forest.

Key words: East Belitung, knowledge, medicinal animals, medicinal plants, traditional healers

INTRODUCTION

Ethnobiology, as a scientific discipline, has not been developed much in Indonesia, even though the use and management of biodiversity by traditional societies is still high (Vitalini et al. 2013; Iskandar 2016). Ethnobiological knowledge also forms the basis for understanding human relations with plants (ethnobiology) and animals (ethnozoology) (Narchi et al. 2014). The potential for plants and animals to be recognized as traditional medicinal ingredients is an integral part of human culture and society (Alves & Souto 2011; Woerdenbag et al. 2012; Adorisio et al. 2016).

According to the Law No. 6/2012, traditional medicine is an ingredient made from minerals, plants, animals, or mixtures of various materials used as medicine by the community (Permenkes 2012). The World Health Organization (WHO) says that about 80% of people still trust plants and animals as a traditional medicine in the community where among the 252 essential chemicals, 11.1 percent comes from plants and 8.7 percent comes from animals (Verma et al. 2014). The world's population estimates that three-quarters of society cannot afford to buy modern medicines and depend on the use of traditional medicines (Ansari & Inamdar 2010; Adorisio et al. 2016). Therefore, the biological resources available in nature are a cheap source of medicines for the community, and it is necessary to maintain the health of the community, especially the local community (Woerdenbag et al. 2012; Butt et al. 2015).

In general, community knowledge about traditional medicine comes from experience and skills that are inherited from one generation to the next one (Zahara 2017), delivered orally from parents to their children, as well as from the traditional elders of the community. However, the habit of delivering information verbally to the children that lack interest in it today causes the degradation of information for the future. As a result, knowledge of local wisdom, especially related to drugs, is increasingly endangered, given that it is only orally transmitted instead of any written form (Afriyansyah et al. 2016). Exploring the potential of local knowledge about traditional medicine can provide new information in selecting raw materials for medicines (Butt et al. 2015; Saudah et al. 2019). This drug knowledge is inherited from their ancestors and passed down across generations using local languages (Iskandar 2016). Traditional medicine is an integral part of human daily life regardless of the culture, time, or development of knowledge in a country (Adorisio et al. 2016; Addoun et al. 2018). The trend in the consumption of traditional medicines (herbal) is marked by the increasing value of its trade in the world market (Vijayakumar et al. 2015).

Several studies on traditional Bangka medicine have been carried out by the local people in South Bangka Regency (Henri et al. 2020), showing that local people still use plants for medicine in early childhood, featuring 55 plant species from 35 families which are

dominated by the Euphorbiaceae family. Likewise, Afriyansyah et al. (2016) found the Lom tribe used 24 traditional medicines from 24 animals. While Oktavia (2012) revealed that the composition of vegetation and the potential of medicinal plants in the forest of East Belitung Regency is still very much. This condition is expected to be in line with the high level of knowledge of traditional medicine and the high perception of the benefits of traditional medicine. Therefore, the existence of plants and animals that have the potential as medicines can be maintained and utilized for the next generation. Perceptions and knowledge about traditional medicine can be implemented as input for the management of biological resources and ecosystems by applying local wisdom. Therefore, this study aims to find out the perceptions and knowledge of the East Belitung Malay ethnic community in traditional medicine.

RESEARCH METHOD

The study was conducted in East Belitung district which consists of seven subdistricts with 13 villages, namely: Manggar Subdistrict (Kurnia Jaya Village and Lalang Jaya Village), Damar Subdistrict (Sukamandi Village and Mempaya Village), Gantung Subdistrict (Gantung Village and Selinsing Village), Kelapa Kampit Subdistrict (Senyubuk Village and Cendil Village), Simpang Renggiang Subdistrict (Renggiang Village and Aik Madu Village), Simpang Pesak Subdistrict (Simpang Pesak Village), and Dendang Subdistrict (Dendang Village and Jangkang Village) (Figure 1).

Data on community knowledge about animals and plants as a traditional medicine in East Belitung Regency were collected through the following stages: conducting a field survey and observation to dig information from the community. The informants were selected using purposive sampling technique. The criteria for informants to be interviewed include: residents born in the study area, having knowledge of medicinal plants and animals, traditional ceremony performers, or traditional leaders (Shuaib et al. 2018; Oyeyemi et al. 2019). The age ranges of the informants follow Witjoro et al. (2016), namely 17-30 years (young), > 30-45 years (adults), > 45-49 years (middle age), and > 60 years (old). Then, the interview stage is intended for documentation of medicinal plants and animals for identification.

Informant Consensus Factor is used to measure homogeneity and consensus among informants in the use of medicinal plants to treat certain categories of disease (Faruque et al. 2018). It can also be used to identify the pharmacological importance of animal species collected and to analyze the level of agreement of informant knowledge about each disease category (Kim & Song 2013) using the formula:

$$ICF = N_{ur} - N_t / N_{ur} - 1$$

Note:

N_{ur} : total number of reported use for each disease category

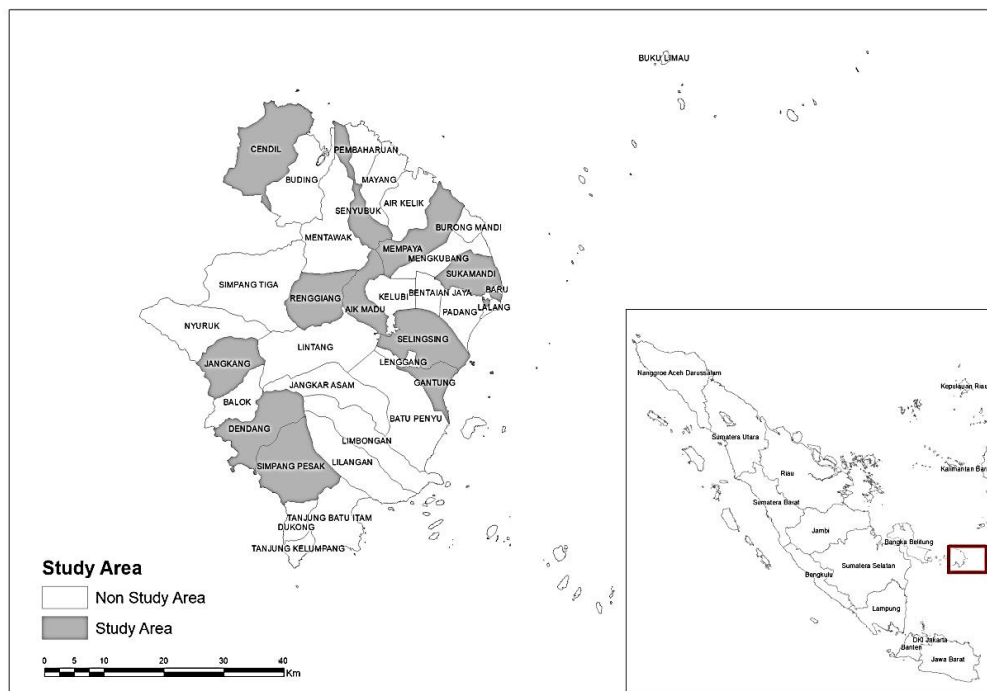N_t : number of plant or animal species reported for each reported disease

Figure 1 Maps of study area in East Belitung

RESULT AND DISCUSSION

The socio-demographic conditions of the informants are shown in Table 1, indicating that traditional treatments are carried out more by males than females. This is in line with (Kayani et al. 2015), stating that the informants are mostly male by 95.86%, while female was about 4.13%. This result is in line with (Henri et al. 2020), stating that the informants are mostly male (84%), compared to women (16%) of the total 45 informants interviewed. Tchicaillat-Landou et al. (2018) also stated that male informants of shaman were 16 (80%) compared to four women (20%). However, Tarfaya Moroccan Province showed different result, i.e., women (56.7%) used medicinal plants more dominantly than men (43.3%) (Idm'Hand et al. 2020).

Table 1 shows that traditional healers or those who master traditional medicine in the East Belitung community, both Malays and local communities, are generally elderly. The number of people who have the skills and abilities of traditional medicine decreased in the young people, and it was not even found in the population aged < 29 years. The low number of people who have knowledge and ability of traditional medicine shows the low interest of the younger generation. This is because the younger generation is more easily affected by technological advances and the times, so that learning the legacy of knowledge in traditional medicine is not something that has to be studied anymore. In addition, the rapid development of pharmaceuticals using chemical products is easily found in pharmacies or stalls that sell medicines without a doctor's prescription. The current research is almost the same as research in Pakistan showing that the low knowledge of young groups about traditional medicine was caused by a lack of interest in studying and practicing it mainly due to globalization (Kayani et al. 2015). In addition, the low ability of young people related to traditional medicine, due to the ease of access to communication and practical use of chemical drugs, has caused young people to be reluctant to prepare traditional medicines (Utami et al. 2019). The same thing happened in the province of Tarfaya, southern Morocco, in which the younger groups knew less traditional medicine, due to their ignorance of the use of traditional medicinal plants (Idm'Hand et al. 2020). Knowledge of traditional medicine and its properties are generally obtained after long experience accumulated and transmitted from one generation to another. The transmission of this knowledge is in danger today because it is not always guaranteed. Previous studies have shown that the use of medicinal plants is greater among the 30 and 60 year age groups and has reported that this group is more susceptible to disease (El Azzouzi & Zidane 2015).

The level of education of informants varies with the lowest level is elementary school, but those who know and have skills about traditional medicine graduated from higher education level. The number of informants with higher level of education decreases in line with the subsequent increase in education level (Table 1). Thus, it appears that the higher education that traditional healers have is inversely proportional to the number of those who have traditional medical knowledge and skills. This shows that traditional medical knowledge is not obtained through formal education but carried out with a culture handed down orally from previous generations. In general, traditional medicinal knowledge is a legacy of the nation's ancestors that has been used for generations for treatment and maintenance of health (Siswanto 2013). The level of education of informants who can deal with traditional medicine is slightly different from Tchicaillat-Landou et al. (2018), finding that in Congolese society, the level of education varied from uneducated (10%), primary school (20%), secondary school (50%), and university (20%). Thus, based on the level of formal education, the experience and knowledge of local people related to traditional medicine decrease in line with the increasing level of education. This indicates that people who have higher education pay less attention to the use of traditional medicines sourced from plants and animals (Kayani et al. 2015). This change seems to generally occur in all areas experiencing degradation. Local knowledge about traditional medicine and natural ingredients of medicine in the local community began to be displaced by modern medicine. Today, in line with the development of the market economy, the rise of sales of modern medicines from the city to the village and the increasing population cannot be denied. In addition, the reduced interest of the younger generation in terms of exploring and preserving local knowledge about traditional medicine as well as lack of local languages have caused the acceptance and dissemination of local knowledge about traditional medicine are less conveyed and gradually disappear. Besides, in general, parents who know medicinal plants do not play an active role in informally teaching to their children. Utami et al. (2019) mentioned that knowledge from parents also influences the ability to process medicinal plants.

Half of the informants have practiced traditional medicine > 20 years. Meanwhile, 25% of the informant have practiced 10-20 years of traditional treatment experience, and only 3.57% of the information opened traditional medicine practices with the least experience of < 2 years. Idm'Hand et al. (2020) stated that the informants aged > 50 years have the most knowledge about medicinal plants.

1. Informant Knowledge Agreement on Each Category of Disease Type

Informant Consensus Factor (ICF) for traditional medicines derived from plants and animals according to the informant can be divided into 12 categories based on the disease (Table 2). Many of the traditional medicine practitioners' informants were visited by consumers who mostly complained about respiratory disorders, muscle and bone disorders, as well as skin and heart disease.

Table 1 Socio-economic characteristics of the informant

No.	Variable	Category	∑ Informant (person)	Percentage (%)
1	Informant category	Traditional medicines	20	71.43
		Local community	8	28.57
2	Gender	Male	24	85.71
		Female	4	14.29
3	Age (years)	30-39	1	3.57
		40-49	6	21.43
		50-59	3	10.71
		> 60	18	64.29
4	Education	No education	0	0
		Elementary school	20	71.43
		Junior high school	4	14.29
		Senior high school	3	10.71
		Diploma/undegraduate	1	3.57
5	Practical experience (years)	< 2	1	3.57
		2-5	1	3.57
		5-10	5	17.86
		10-20	7	25.00
		> 20	14	50.00

Table 2 Informant Consensus Factor (ICF) value of traditional medicine from animal (A) and plant (F) material and type of disease treated

Categories of diseases	Number of usage reports		Usage reports (%)		Number of Species used		Species amount (%)		ICF	
	A	F	A	F	A	F	A	F	A	F
Indigestion	10	159	11.91	39.07	8	97	12.5	34.4	0.22	0.39
Respiratory disease	19	10	22.62	2.46	13	10	20.31	3.55	0.33	0
Muscle and Bone disorders	5	37	5.95	9.09	4	27	6.25	9.57	0.25	0.28
Urinary disorders	-	12	-	2.95	-	9	-	3.19	-	0.27
Sexual disease	2	15	2.38	3.69	2	11	3.13	3.9	0	0.29
Gland abnormalities	5	14	5.95	3.44	4	13	6.25	4.61	0.25	0.08
Ear, Nose, Eye Disease	-	8	-	1.97	-	6	-	2.13	-	0.29
Nail, skin and hair diseases	17	42	20.24	10.32	13	29	20.31	10.28	0.25	0.32
Nerve disorders	1	10	1.19	2.46	1	8	1.56	2.84	0	0.22
Cardiovascular disorders	1	45	1.19	11.06	1	30	1.56	10.64	0	0.34
Poison Antidote	2	3	2.38	0.74	2	3	3.13	1.06	0	0
Energizing the body	13	23	15.48	5.65	9	19	14.06	6.74	0.33	0.18
Infectious diseases	5	20	5.95	4.91	4	17	6.25	6.03	0.25	0.16
Antidote	4	3	4.76	0.74	3	3	4.69	1.06	0.33	0

Based on the analysis of disease categories, it is grouped into 12 categories for traditional medicine from animals and 14 categories for plants (Table 2), showing that ICF values range between 0.00 to 0.39. Disease categories such as sexual diseases, nerve disorders, cardiovascular disorders, and poison antidotes (ICF animals) as well as antidotes and respiratory diseases (ICF plant) get a zero value in the possibility of an agreement between informants on plants or animals used are very low due to the absence of information among the informants. The highest ICF value in plants (0.392) is in the category of digestive disorders, while the highest ICF value in animals is in the respiratory disease category and as an energizing the body where each ICF value is 0.33. People in East Belitung Regency believe

that plants used as traditional medicines for digestive disorders such as abdominal pain, bloating, and ulcers vary greatly in line with the results obtained. According to Kayani et al. (2015) and Yabesh et al. (2014), indigestion is caused by poor environmental hygiene or water contamination which results in reduced drinking water quality. According to the informants, some animals are believed to be used to treat asthma such as grouse (*Dendrocygna arcuata*), dugong (*Dugong dugon*), velvet (*Tapinauchenius gigas*), retreat (*Myrmeleon sp*), keluang (*Pteropus sp*), sabak snake (*Phyton reticulatus*), scorpion (*Heterometrus* sp.), stratum (*Tragulus* sp.), cough (*Belisarius xambeui*) and ansu-ansu (*Parapolybia varia*). Rahman et al. (2016) stated that digestive disease starts from the visible in the mouth, and some herbs, shrubs

and trees (16%), whereas Lamiaceae with four species was the leading family, majority of medicinal plant

species used in the treatment of toothache (38%), wound healing (19%), gum infections (16%). Meanwhile, the lowest percentage of species are used for mouth ulcers as well as teeth powder (3%). If it is not treated quickly, respiratory disorders (asthma) are a common cause of illness and death. Alamgeer et al. (2018) found that people in Pakistan often experience health problems due to their remote location, cold and harsh climatic conditions, and scarce health care facilities. People rely on native plant resources to cure various disorders.

The second highest is cardiovascular disorders (0.34) with 45 reports of use and 30 types of plants. One type of cardiovascular diseases that is often experienced is hypertension. Some plants are used to treat hypertension, such as Chinese trident (*Gymnanthemum amygdalinum*), male exfoliate (*Dicentra eximia*), tad gadok (*Leucas lavandulifolia*), eggplant (*Tinospora crispa*), breadfruit (*Artocarpus altilis*), sisilen (*Solanum rostratum*), sire belande (*Peperomia pellucida*), meleman (*Psychotria malayana*), and snaps (*Persicaria capitata*). Riondato et al. (2019) found that in Madagascar communities the higher ICF values were recorded for cardiovascular complaints (0.75), general and unspecific diseases (0.74), digestive disorders (0.69), and diseases of the skin (0.55). The traditional medicinal uses of 18 species (15 endemic) were described for the first time.

2. Medicinal Plant and Animal Conservation Strategies

The SWOT analysis are carried out by analyzing internal and external factors towards the conservation of medicinal plants in East Belitung Regency (Table 3). Most of informants did not cultivate medicinal plants around their house, even some informants mentioned that medicinal plants could not be cultivated because the habitat and texture of the soil does not match with the forest habitat. There are few informants who try to cultivate medicinal plants collected from the forest to be planted in around the house. However, some of the plants are not able to survive. Our informants mentioned that medicinal plants are difficult to obtain, and we had to conduct a survey far away from home to find the medicinal plants. The presence of medicinal plants is still abundant in the forest but it is far inside the forest. The considerable distance to cover the forest is due to the fact that some of the forests close to housing have been converted into tin mining and oil palm plantations. This resulted in some medicinal plants that were in it are now damaged or even lost. Some animals used as medicine

are also rather difficult to find in their natural habitat because the habitat is damaged by development, tin mining, and oil palm plantations.

Activities that need to be carried out are to conserve forests that still have a variety of medicinal plants and animals in them, so that they do not become extinct in their natural habitat. It is believed that plants and animals that are taken continuously without taking action will threaten the extinction of medicinal plants and animals. The extraction of medicinal plants and animals directly from nature without regarding the sustainability can cause scarcity and result in extinction (Henri et al. 2018). Therefore, some efforts need to be taken into action to develop medicinal plants and animals such as by increasing synergistic cooperation between conservation institutions and the community (Ledo & Seran 2019). In addition, it needs to introduce medicinal species accompanied by conservation and outreach agencies to carry out their cultivation to the local community to be more concerned about the potential of medicinal plants and the preservation of medicinal animals (Ledo & Seran 2019). Appropriate conservation strategies such as grazing control, reforestation, and rangeland management can be adopted to promote the sustainable use of traditional medicines (Murad et al. 2013).

Environmental education in the community in East Belitung Regency can be implemented by providing learning materials containing knowledge on animal ecology, plant ecology, the impact of animal hunting, and forest destruction on the sustainability of the ecosystem (Sayektiningsih & Mediawati 2017). Increasing the interest of young people in the use of traditional medicines can be done by making products made from plants and animals as medicines that are easy to consume and whose properties are scientifically proven. In addition, the role of shamans as traditional leaders is very essential in maintaining forest sustainability in East Belitung Regency due to land clearing. In this case, shamans can act as guardians of the region, for example people who want to open an area must follow the procedures established by the shamans to ensure the area does not include the prohibited forest or forest in which there are occult spirits (Wildan & Irwandi, 2018). When the shaman has forbidden opening the area, then the person or the community will not dare to violate it. If there are people who break them, there will be risks such as illness, accident to the workers, being failed in the business, and even death. The effort to preserve a certain forest area by the local community is not based on the awareness of the community itself but is related to sanctions and disasters that occur accepted if it destroys the area (Wildan & Irwandi 2018).

Table 3 SWOT analysis of plants and animals as medicine

Internal	*Strength*	*Weakness*
	The community has the ability to formulate traditional medicine. Availability of raw materials for traditional medicines in nature. The role of custom which is still very strong in maintaining the safety of natural areas or forests.	Lack of interest in young people related to learning traditional medicine. Lack of education on the environment. Lack of synergic cooperation between conservation agencies and the community.
External		
Opportunity The quality of the environment decreases causes plants and animals to become extinct, so that conservation activities are applied. The establishment of Geopark as a geological heritage to protect the diversity of the earth, environmental conservation, and provide employment opportunities for the community. Increasing the market for medicinal plants and animals	Strategy S-O Conducting promotional activities to increase community income. The availability of raw materials in nature that are easily obtained provides opportunities for the community to make traditional medicinal products for income. Maintaining forest safety by obeying the orders of traditional leaders	Strategy W-O Providing knowledge about the use and procedures of plants and animals as a medicine for young people so that they will not disappear in the future. Socializing the importance of environmental education in the community Enhancing cooperative relationships with communities with conservation institutions
Threat Conventions on forest land into open land are increasing. Community knowledge is still low on the protection of certain species. Excessive use of medicinal plants and animals without any conservation efforts	Strategy S-T Maintaining a forest that still has a diversity of medicinal plants in it. Using plants and animals as medicine wisely.	Strategy W-T Providing social sanctions for communities that damage forests where biodiversity exists. Increasing community income by growing plants and animals as medicine. Development of human resources around the conservation area.

CONCLUSION

The local community in East Belitung Regency is currently still applying traditional medicine in their daily life. The use of plants and animals as medicine is more widely known by people aged > 60 years with an average duration of use > 20 years compared to the age level at a young age. Forest preservation is one of the conservation strategies that can be applied, this is because the forest still has a variety of medicinal plants and animals in it which can be used as a source of community medicine.

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