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# Kajian Etnomedisin Tanaman Obat yang Digunakan untuk Mengatasi Keluhan Gastrointestinal oleh "Etnis Kaili Ledo" di Sulawesi Tengah, Indonesia

# An Ethnomedicinal study of Medicinal Plants Used against Gastrointestinal Complaints by "Kaili Ledo Ethnic" in Central Sulawesi, Indonesia

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## Abstract

The research entitled "An ethnomedicinal study of medicinal plants used against gastrointestinal complaints by Kaili Ledo Ethnic in central Sulawesi, Indonesia was undertaken from May 2019 to March 2020. The research site was located in Raranggonau, an oldest subvillage of Kailinese Ledo aimed to conserve the ethnomedicinal knowledge of Kaili Ledo ethnic in using plants for healing gastrointestinal complaints and to select candidate medicinal plants for further phytochemical and pharmacological investigation. The data indigenous knowledge of medicinal plant has been collected by using in-depth interview with prior informed consent using an open-ended questionaire. A snowball technique was performed to obtain a appropriate respondents. Descriptive statistical method was employed to analyse and summarize the ethnobotanical data on the reported medicinal plants and associated knowledge. The result showed that there were 25 plants belonging to 16 families were found to be used against gastrointestinal complaints in the studied area. Most dominant family used against gastrointestinal complaints was Lamiaceae (3 plants), followed by Poaceae, Fabaceae, Euphorbiaceae and Asteraceae (2 plants each). Solanaceae, Asparaginaceae, Araucariaceae, Rosaceae, Rubiaceae, Musaceae, Melastomataceae, Caricaceae, Basellaceae and Balsaminaceae (1 plant each).

**Key words:** Gastrointestinal, Kaili ledo, medicinal plant, Central Sulawesi

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## Introduction

Plants have traditionally been used as a source of medicine in Indonesia. The traditional use of plants for healing in Indonesia dates back to prehistoric times (Riswan and Rumantyo, 2002; Padua et al., 1999). Javanese people for example have utilized herbal medicine (called "Jamu") since along time ago. Jamu can consist of a single or a mixture of some medicinal plants (Sangat and Larashati, 2002).

There are 996 species of flowering plants reported by Heyne (1987) which had been used as traditional medicines in lndonesia, and it would make a total l,040 specics if including algae, fungi, ferns and gymnospermae species. Zuhud (1994) argues that about 1260 tree species in tropical rain forests of lndonesia are utilized as medicinal plants.

Herbal medicine is still maintain of about 75-80% of the world population, mainly in the developing countries, for primary health care (Oladele et al., 2011; Ahvazi et al., 2012). This is primarily because of the general belief that herbal drugs are without any side effects besides being cheap and locally available (Rodrigues et al., 2003). WHO (World Health Organization) estimates that about 80% of these people rely almost exclusively on traditional medicine for their primary healthcare needs. Medicinal plants are the "backbone" of traditional medicine, which means more than 3.3 billion people in the less developed countries utilize medicinal plants on a regular basis.

There are nearly 1,340 ethnics group in Indonesia (BPS,2010), and almost every group has its own traditional medical knowledge and experiences. Nineteen (19) ethnics of them are living in Central Sulawesi (Pitopang and Safaruddin, 2012). These ethnic group occupy different areas, and each group has its own culture and traditions in utilizing plants for their daily need such as: for household appliances, pharmaceuticals and medicine (Fathurahman et al 2016; Pitopang and Ramawangsa, 2016).

Kaili Ledo subethnics is one of the indigenous people who have long lived and settled in the subvillage of Mantikole Roranggunau, Sigi district the Province of Central Sulawesi This community have used various plant species as medicine for healing several desease including gastrointestinal complaints. Gastrointestinal disorders are common in developing countries including Indonesia because these areas lack hygienic condition and malnutrition as well as having insufficient availability of pure water.

The main purpose of the study was to conserve the ethnomedicinal knowledge of Kaili Ledo ethnic in using plants for healing gastrointestinal complaints and to select candidate medicinal plants for further phytochemical and pharmacological investigation.

## Research methods

### Research Site and Plant Material

The research was undertaken from May 2019 to March 2020. The research site was located in Raranggonau, an oldest subvillage of Kailinese Ledo. It has inhabited by 210 residents (111 males and 99 females). The area is very close to the border of Grand Forest Park of Central Sulawesi (0°58'19,77S, 119°59'59,18" E), at elevation 1047 m asl. dpl, with topography ranging from slope to very steep. It can be accesed by motor cycle about 12 km from Biromaru district the capital of Sigi Biromaru district, Sigi Regency, the province of Central Sulawesi (Figure 1).

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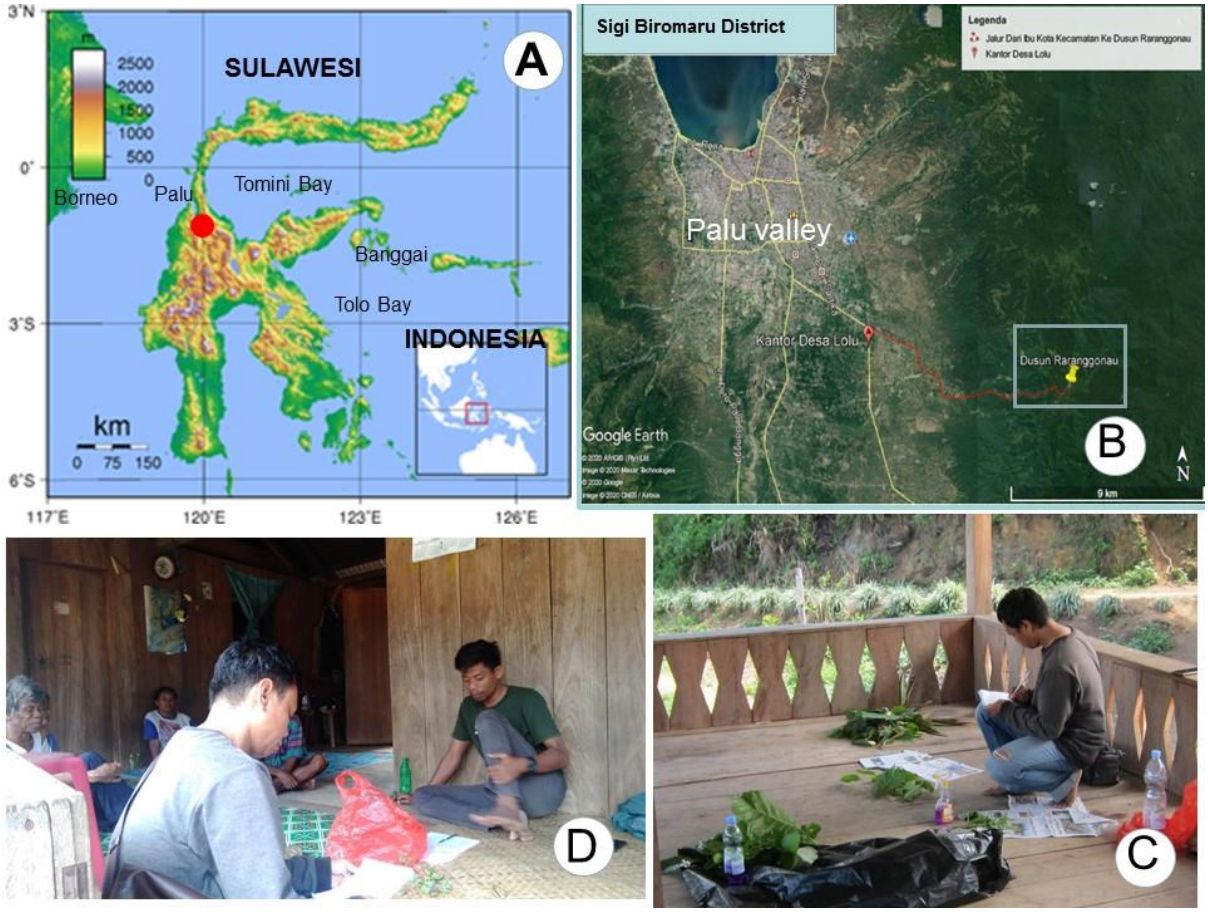


**Figure 1. Map of research site. A. Sulawesi, B. Subvillage Raranggonau is located in Sigi regency, Central Sulawesi (Source : Modified from Google Earth, 2020), C. Proccessing of plants samples, D. Interview proccess**.

### Ethnobotanical Data

The data indigenous knowledge of medicinal plant used by *Kaili Ledo* has been collected by using in-depth interview with prior informed consent using an open-ended questionaire. A snowball technique was performed to obtain a appropriate respondents. Twenty one (21) respondents such as; village leaders, custom (adat) leaders, traditional healers, religious leaders, foresters (i.e. rattan collectors) and farmers were asked a series of questions related to perceptions of the traditional use of medicinal plants.

### Plant Collection and Identification

Plant samples were collected with the help of respondents from wild and cultivated areas. Collected voucher specimens were taken to the Herbarium Celebense (CEB) Tadulako University Palu. Specimen identification and confirmation were undertaken by using Flora Malesiana Series, and other sources. Specimens with their label were stored at CEB.

### Data Analyses

Descriptive statistical method was employed to analyse and summarize the ethnobotanical data on the reported medicinal plants and associated knowledge (Bekalo et al, 2009)

## Results and Discussion

There were 25 plants belonging to 16 families were found to be used against gastrointestinal complaints in the studied area (Table 1). Most dominant family used against gastrointestinal complaints was Lamiaceae (3 plants), followed by Poaceae, Fabaceae, Euphorbiaceae and Asteraceae (2 plants each). Solanaceae, Asparaginaceae, Araucariaceae, Rosaceae, Rubiaceae, Musaceae,

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Melastomataceae, Caricaceae, Basellaceae and Balsaminaceae (1 plant each). Gastrointestinal complaints were cosisted of stomach ache, diarrhea, dysentry, vomiting blood, internal desease, constipation, gastrointetinal parasitic worms, abdominal pain and hemmorhoids.

Leaves were most preferred plant part (48%) utilized in herbal formulation followed by roots (32%), young shoot and sap (8% each) and rhizome (4 %) (Table 2). Habitat of plant indicated that garden/field and homeyard (40% each) and forest (20%). Most plant habitus used againts gastrointestinal disorder was shrub (40%), followed by tree (28%), herb (24%) and climber (8%).

**Table 1. Plant species, botanical name, local name, habit, uses and their part used againts gastrointestinal complaints by Kaili Ledo Subethnic in the studied area**

| No | Family | Botanical name | | Local name (Kaili Ledo) | Habit | Uses | Part Used |
|---|---|---|---|---|---|---|---|
| 1 | Araucariaceae | 1 | *Agathis celebica* (koord.) Warb | Dama | Tree | Abdominal pain | Resin is eaten |
| 2 | Asparagaceae | 2 | *Cordyline fruticosa* (L.) A.Chev | Taba | Shrub | Vomiting blood, dysentry | Roots are boiled, drink |
| 3 | Asteraceae | 3 | *Vernonia amygdalina* Delile. | Sindi | Shrub | Diarrhea | Leaves are chewed |
| | | 4 | *Crassocephalum crepidioides* (Benth.) S.Moore. | Nipo | Herb | Diarrhae | Leaves are boiled, drink |
| 4 | Balsaminaceae | 5 | *Impatiens balsamina* L | Golontigi | Herb | Internal wounds | The leaves are boiled and drunk |
| 5 | Basellaceae | 6 | *Basella rubra* L. | Lalode | Climber | Vomiting blood | Roots are boiled, drink |
| 6 | Caricaceae | 7 | *Carica papaya* L | Gempaya | Tree | Intern disease | The water from stem is drunk |
| 7 | Convolvulaceae | 8 | *Merremia umbellate* (L.) Hallier f. | Rarayo | Herb | Hemorrhoids | Daun |
| 8 | Cucurbitaceae | 9 | *Luffa aegyptiaca* Philip Miller | Patola | Climber | Abdominal pain | Roots are boiled, drink or Roots + Coconut oil |
| 9 | Euphorbiaceae | 10 | *Homalanthus populneus* (Geisler) Pax. | Vilanti | Tree | Abdominal pain | Young leaves are chewed |
| | | 11 | *Mallotus barbatus* Var. | Vilonti | Tree | Constipation | Leaves are eaten |

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| No | Family | Botanical name | | Local name (Kaili Ledo) | Habit | Uses | Part Used |
|---|---|---|---|---|---|---|---|
| 10 | Fabaceae | 12 | *Leucaena leucocephala* Lamk | Tamalanja | Tree | Abdominal pain | Leaves is chewed |
| | | 13 | *Desmodium gangeticum* (L.) Dc | Gompiasu | Herb | Vomiting blood | Leaves are boiled, drink |
| 9 | Lamiaceae | 14 | *Orthosiphon aristatus* (Blume) Miq. | Kayu Posu | Herb | Abdominal pain | Leaves are boiled, drink |
| | | 15 | *Clerodendron paniculatum* L. | Sirarayo | Shrub | Hemorrhoids | The leaves are washed clean |
| | | 16 | *Plectranthus scutellarioides* (L) R.Br. | Mayana | Herb | Vomiting blood | Leaves are boiled, drink |
| 10 | Melastomataceae | 17 | *Melastoma malabatrichum* L | Timbuwu | Shrub | Hemorrhoids | Root is boiled drink |
| 11 | Musaceae | 18 | *Musa acuminate* Luigi Aloysius Colla | Loka tambaga | Herb | Vomiting blood | Boiled roots, drunk |
| 12 | Myrtaceae | 19 | *Psidium quajava* L. | Jambu Biji | Tree | Diarrhea | Young leave sare eaten |
| 13 | Poaceae | 20 | *Zea mays* L. | Dale taba | Herb | Vomiting blood | Roots are boiled, drink |
| | | 21 | *Saccharum officinarum* L. | Tobu taba | Herb | Vomiting blood | Young laeves are boiled |
| 14 | Rosaceae | 22 | *Rubus moluccanus* L. | Kaoti | Shrub | Hemorrhoids | Roots are boiled, drink |
| 15 | Rubiaceae | 23 | *Morinda citrifolia* L | Bangkudu | Tree | Abdominal pain | Leaves are boiled, drink |
| 16 | Solanaceae | 24 | *Capsicum fructescens* L. | Marisa | Shrub | Abdominal pain | Roots are boiled, drunk |
| 17 | Zingiberaceae | 25 | *Curcuma xanthorhiza* Roxb | Kunilola | Herb | Abdominal pain | Rhizome is boiled, drink |

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**Table 2: Habit, parts used and habitat of medicinal plants in studied area.**

| General attributes | Total Plants | % age |
|---|---|---|
| **Habit** | | |
| Tree | 7 | 28 |
| Herb | 6 | 24 |
| Shrub | 10 | 40 |
| Climber | 2 | 8 |
| **Part Used** | | |
| Leaves | 12 | 48 |
| Root | 8 | 32 |
| Stem | 0 | 0 |
| Bark | 0 | 0 |
| Whole plant | 0 | 0 |
| Fruit | 0 | 0 |
| Sap | 2 | 8 |
| Young shoot | 2 | 8 |
| Flower | 0 | 0 |
| Rhizome | 1 | 4 |
| Bulb | 0 | 0 |
| **Habitat** | | |
| Forest | 5 | 20 |
| Garden/field | 10 | 40 |
| Homeyard | 10 | 40 |

The Kaili Ledo subethnics have used about 25 plant species belonging to 16 families for healing gastrointestinal complaints. Local healers mostly used plants that belong to family Lamiaceae because this family is traditionally being used against various gastrointestinal infections not only in stidied area but throughout the world (de Padua et al, 1999) that might be due to presence of potential phytochemical (Metakou et al, 2007; Chai et al, 2014). Poaceae, Fabaceae, Euphorbiaceae and Asteraceae are also used by the healers after Lamiaceae and similar results have also been reported by Paik et al (2013).

Traditional healers were not used all plant parts in remedy preparation but leaves were most frequent (48%) Possible reason behind these results might be that leaves contain high concentration of secondary metabolites. Present results are in line with study conducted in another country in which leaves are commonly used against digestive problems (Saxena et al, 2014, Muralidharan and Narasimhan, 2012). Roots, young shoot and rhizome were also used as medicine againts gastrointestinal disorder.

There were eight (8) plants utilized for abdominal pain, seven (7) for vomiting blood, 3 (three) for diarrhea, 4 (four) for hemorrhoids, 1 for constipatiens, and 1 species for dysentry. The following plants species were used for abdominal pain; *Agathis celebica, Luffa aegiptiaca, Orthosipon aristatus, Homalanthus populneus, Leucaena leucocephala, Morinda citrifolia, Capsicum fructescen and Curcuma xanthorhiza.* Seven species such as; *Cordyline fruticosa, Basella rubra, Desmodium gangeticum, Plectranthus scutellaroides, Zea mays, Saccharum officinarum* and *Musa accuminata* were used for voiting blood. *Vernonia amygdalina, Crassocephalum crepidiodes and Psidium guajava* were utilized againts diarrhea. The Kaili ledo subethnic in studied area employs

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four (4) plants species as medicine for hemorrhoids namely; *Merremia umbelata, Clerodendron paniculatum, Melastoma malabatricum and Rubus mollucanus.*

The utilization of plants species as medicine might be they contain secondary metabolite compound. Secondary metabolites are not necessary for organism to live, but play a role in the interaction of organism with its surroundings, ensuring the continued existence of the organism in its ecosystems. They protect plants against stresses, both biotic (bacteria, fungi, nematodes or insects) and abiotic such as; higher temperature and moisture, shading, injury or presence of heavymetals (Pagare et al, 2015). The phytochemical screening of plant in Indonesia is actively studying because knowledges of the presence of chemical compounds such as steroids/triterpenoids, alkaloids, phenolic, flavonoids, saponins and tannins in the plants will help us to further characterize the plants for economic uses, for example as medicine, cosmetics and others (Ramadanil et al, 2019).

## Conclusion

It is concluded that there were 25 plants belonging to 16 families were found to be used against gastrointestinal complaints in the studied area. Most dominant family used against gastrointestinal complaints was Lamiaceae (3 plants), followed by Poaceae, Fabaceae, Euphorbiaceae and Asteraceae (2 plants each). Solanaceae, Asparaginaceae, Araucariaceae, Rosaceae, Rubiaceae, Musaceae, Melastomataceae, Caricaceae, Basellaceae and Balsaminaceae (1 plant each).

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## Reference

Ahvazi, M., F. K. Sigarodii, M. M. Charkchiyan, F. Mojab, V.A. Mozaffarian and H. Zakeri. 2012. Introduction of medicinal plants species with the most traditional usage in Alamut region. Iran. J. of Pharma. Res. 11 (1): 185-194

Bekalo TH, TH. Woodmatas and ZA Woldemariam. 2009. An ethnobotanical study of medicinal plants used by local people in the lowlands of Konta Special Woreda, southern nations, nationalities and peoples regional state, Ethiopia. Journal of Ethnobiology and Ethnomedicine 2009, 5:26. http://www.ethnobiomed.com/content/5/1/26

Chai T.T, F.C Wong, F. A. Manan, KF Ooh,and N I M Ismail. 2014. *Orthosiphon aristatus: A* Review of Traditional Uses, Phytochemical Profile, and Pharmacological Properties In. Gupta VK. Traditional and Folk Herbal Medicine.Vol 2(2014): 153-187. Published by: Daya Publishing House, New Delhi.

De Padua L.S., N. Bunyapraphatsara and R.H.M.J. Lemmens. 1999. Medicinal and Poisonous Plants. Plant resources of Southeast Asia. No 12 (1). PROSEA, Bogor Indonesia

Fathurrahman, J. Nursanto, A. Madjid and R. Ramadanil. 2016. Ethnobotanical study of Kaili Inde Tribe in Central Sulawesi Indonesia. Emirate Journal of Food Agriculture. 28 (5): 337-347

Gailea R., A.A. Bratawinata, R. Pitopang and I.W. Kusuma. 2016. The use of various plant yypes as medicines by local community in the enclave of the Lore Lindu National Park of Central Sulawesi, Indonesia. Global Res. Med. Plants and Indig. Med. Vol. 5. Issue 1, 29-40.

Heyne, K. 1987. Tumbuhan Berguna Indonesia III. Balai Penelitian dan Pengembangan

E-ISSN: 2686-6579 ISSN: 2302-2027
MITRA SAINS

Kehutanan. Departemen Kehutanan Republik Indonesia. Bogor, Indonesia.

Indonesia Central Bureau of Statistics (BPS) (2010). Indonesia Sub District in Figures

Mitakou, S., Kotsos, M.P., and Aligiannis, N. (2007). A New Flavonoid Diglycoside and Triterpenoids from *Stachys spinosa* L. (Lamiaceae), *Biochemical Systematics and Ecology*. *35*, 381-385

Oladele, A.T., G.O. Olade, anddd O.R. Omowubajo, 2011. Medicinal conservation and cultivation by traditional medicine practitioner (TMPs) in Aiyedaadee local government area of Osun State, Nigeria. Agri. and Biol. J. of N. Am. 2 (3): 476-487

Pagare S, M.Bhatia, N. Tripathi, S. Pagare and Y.K. Bansal. 2015. Secondary Metabolites of Plants and their Roles: Overview. Current Trends in Biotechnology and Pharmacy, 9(3): 293-304

Paik, J.H., J. Lee, S. Choi, B. Marwoto, F.Juniarti, D. Irawan and R. Pitopang. 2013. Medicinal of Lore Lindu National Park, Sulawesi Indonesia (Vol. I). KRIBB

BPPT-Tadulako University. PT. Alimindo Sejati. Bekasi Indonesia.

Ramadanil, Damry, Rusdi, Hamzah B, Zubair MS. 2019. Traditional usages and phytochemical screening of selected Zingiberaceae from Central Sulawesi, Indonesia. Pharmacognosy J 11 (3): 505-510

Riswan S and H.S. Rumantyo. 2002. Jamu as Traditional Medicine in Java, Indonesia. South Paciflc Study. Vol. 23 (1): 1-10

Rodrigues, J.C., L. Ascensao, M.A. Bonet and J. Valles. 2003. An ethnobotanical study of medicinal and aromatic plants in the national park of “Serra de Sao Mamede, Portugal. Ethno-pharmacology. 89: 199-209

Sangat H. M. and I Larashati. 2002. Some ethnopithomedical aspects and conservation strategy of several

Saxena S., VK, Y adav and R K.Verma, 2014. Traditional knowledge of medicinal plants used to cure gastro intestinal problems in Jalaun district of Uttar Pradesh, India, Journal of Medicinal Plants Studies. 2(4) 24–28.

Muralidharan R and D. Narasimhan. 2012.Ethnomedicinal plants used against gastrointestinal problem in Gingee Hills of Villupuram district, Tamil Nadu, Journal of Applied Pharmaceutical Science. 2 (10): 123–125.

Growth. Proceedings of the First Asian Conference of Plant Pathology.August 26-28. Beijing. p.10-12