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ETHNOPHARMACOLOGICAL STUDY OF ANTIDIARRHEAL IN THE MIDDLE BOGOR REGION, BOGOR, WEST JAVA, INDONESIA

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ABSTRACT

Although diarrhea is a preventable disease, it continues to have a significant impact on global health. Medicinal plants represent affordable and locally available resources to address many diseases, including diarrhea. This research aims to document and preserve the use of ethnomedicine to treat diarrhea by people in the Middle Bogor Region, Bogor, West Java, Indonesia. Fieldwork was carried out from November to December 2025 using direct interviews, questionnaires, and discussions. Plant species are identified based on standard taxonomic methods, flower morphological characteristics, and where possible, using samples for comparison, as well as consultation with experts and the literature. The plant types obtained were grouped into families according to the Cronquist classification system. Plant names were checked against the Plant List (www.plantlist.org) and the International Plant Name Index (www.ipni.org). This research reports that 30 plant species are commonly used by people in the Middle Bogor Region to treat diarrhea. Among the various plant parts used, leaves (63.3%) are most frequently used in making medicines, followed by rhizomes (13.3%), fruit (6.7%), flowers (6.7%), stem, rind, and seed (respectively 3.3%). Meanwhile, the most frequently used preparation methods were decoction (76.7%) and infusion (23.3%). The results of this research confirm that people in the Middle Bogor Region still rely heavily on medicinal plants for their health care system, especially for the treatment of diarrhea with the most frequently used parts of the leaves and their use in decoctions and infusions.

KEYWORDS: Traditional medicine, Ethnomedicinal plants, Middle Bogor Region, Diarrhea.

INTRODUCTION

Diarrhea is a common health problem worldwide, with approximately 2 billion cases of diarrheal disease occurring each year, predominantly affecting children, and resulting in 1.7 billion episodes of childhood diarrhea annually.[1,2] Diarrhea involves a decrease in absorption, increased fluid secretion, and an increase in the motility of the intestinal tract, resulting in a loss of electrolytes (sodium, chloride, potassium, and bicarbonate) in the liquid stool and, in many cases, dehydration and death.[3] In addition to causing death, diarrheal diseases impair normal food intake and nutrient absorption, resulting in malnutrition, which can have long-term consequences such as impaired growth, cognitive development, and increased susceptibility to chronic diseases. Children who are malnourished, on the other hand, have a higher frequency and longer duration of diarrheal illnesses.[4] Antidiarrheal drugs are grouped into several categories, including antimotility agents, adsorbents, antisecretory compounds, antibiotics, and intestinal microflora. These drugs may have a specific effect, such as when antibiotics are used to treat secretory diarrheas due to enterotoxigenic bacteria, or they may have a non-specific antidiarrheal effect. These non-specific effects may involve pharmacological actions on intestinal transit, intestinal transport, or stool viscosity

that result in symptomatic improvement. Usually, these drugs are not curative but palliative.[5]

Despite advances in understanding and management, diarrhea disease remains one of the leading causes of death in developing countries such as Indonesia.[6] Currently available antidiarrheal drugs can help relieve diarrhea symptoms, usually aimed at reducing the discomfort, dehydration, and inconvenience caused by frequent bowel movements. However, their clinical utilities are restricted by side effects, limited indications, and the development of drug resistance by pathogens.[7] Oral rehydration solution (ORS) is the cornerstone of management to prevent life-threatening dehydration associated with diarrhea. However, ORS is unable to reduce the volume, frequency, or duration of diarrhea, and it has been reported that ORS is not as widely used as it could be.[8] Traditional medicinal plants are widely utilized and play a major part in primary healthcare delivery in Indonesia in both rural and urban regions.[9] One of the Region in Indonesia that still uses herbal plants as an alternative treatment, especially for treating diarrhea, is Middle Bogor Region. This research aims to obtain detailed information about the use of herbal plants for alternative therapy for diabetes mellitus in Middle Bogor Region, Bogor, West Java, Indonesia using a field survey method.

MATERIALS AND METHODS

Study Area

Middle Bogor is located in Bogor Regency, West Java, Indonesia, with an area of 8.37 km^2. This area has an altitude of 350 meters above sea level with an average maximum air temperature of 31°C and a minimum of 24°C. Moreover, it is located between 06°35′44″ South Latitude and 106°47′48″ East Longitude. This area is a tropical climate area that is mostly inhabited by Sundanese tribes (85%) and other tribes (15%). Vegetation in the study area is in humid conditions with an average rainfall of 4,800 mm/year.

Data Collection

An extensive field survey was carried out to obtain information about medicinal plants from the Sundanese tribe in the study area. To document existing information about medicinal plants from tribal practitioners, several field visits were conducted from November to December 2025 in the Middle Bogor Region, Bogor, West Java, Indonesia. During the research, ethnomedicinal information was collected from middle-aged and older tribal practitioners in their local language (Sundanese), through direct interviews, questionnaires, and discussions. Information on local names of plants, plant parts used, preparation methods and administration routes (e.g., infusion, paste, juice and decoction) of all ethnomedicinal plants collected were recorded during the survey period.

Botanical Identification

Plant species are identified based on standard taxonomic methods, flower morphological characteristics, and where possible, using samples for comparison, as well as consultation with experts and the literature.[10] The plant types obtained were grouped into families according to the Cronquist classification system, except for Pteridophyta and Gymnospermae.[11] Plant names were checked against the Plant List (www.plantlist.org) and the International Plant Name Index (www.ipni.org).

Ethics Statement

All participants provided verbal consent before the interview and gave consent to publish the information they provided.

RESULTS AND DISCUSSION

This research revealed that 30 plant species are commonly used by local people to treat diarrhea (Table 1). This shows that the study location is affordable in terms of biodiversity. Among the various plant parts used, leaves (63.3%) are most frequently used in making medicines, followed by rhizomes (13.3%), fruit (6.7%), flowers (6.7%), stem, rind, and seed (respectively 3.3%). The use of leaves is reported to be easier to prepare and easier to extract active substances from them for treatment. At the same time, leaves have less effect on the mother plant.[12] Meanwhile, the most frequently used preparation methods were decoction (76.7%) and infusion (23.3%). These results are in line with previous research which reported that the forms of traditional medicine most widely used by the community were decoctions and infusions.[10]

Table 1: Ethnomedicinal plants, local name, part used, mode of administration, and dosage uses in Middle Bogor, Bogor, West Java, Indonesia.

No	Species	Family	Local name	Parts used	Mode of administration	Dosage of use
1	*Alpinia galanga* L.	Zingiberaceae	Lengkuas	Rhizome	Decoction	10 grams once a day
2	*Andrographis paniculata* Nees	Acanthaceae	Sambiloto	Leaf	Decoction	10 grams once a day
3	*Annona muricata* L.	Annonaceae	Sirsak	Leaf	Infusion	100 grams once a day
4	*Annona squamosa* L.	Annonaceae	Srikaya	Leaf	Decoction	70 grams once a day
5	*Artocarpus altilis* (Park.)	Moraceae	Sukun	Leaf	Decoction	50 grams

	Forsberg					once a day
6	*Artocarpus heterophyllus* Lamk.	Moraceae	Nangka	Leaf	Decoction	25 grams once a day
7	*Carica papaya* L.	Caricaceae	Pepaya	Flower	Decoction	50 grams once a day
8	*Cinnamomum verum* J.Presl	Lauraceae	Kayu Manis	Stem	Decoction	50 grams once a day
9	*Cosmos caudatus* Kunth	Asteraceae	Kenikir	Leaf	Decoction	10 grams once a day
10	*Curcuma longa* L.	Zingiberaceae	Kunyit	Rhizome	Infusion	50 grams once a day
11	*Etlingera elatior* (Jack) R.M.Sm.)	Zingiberaceae	Kecombrang	Leaf	Decoction	50 grams once a day
12	*Garcinia mangostana* L.	Clusiaceae	Manggis	Rind	Infusion	50 grams once a day
13	*Gynura procumbens* (Lour.) Merr.	Asteraceae	Sambung Nyawa	Leaf	Infusion	50 grams once a day
14	*Hibiscus sabdariffa* L.	Malvaceae	Rosela	Flower	Decoction	100 grams once a day
15	*Kaempferia galanga* L.	Zingiberaceae	Kencur	Rhizome	Infusion	10 grams once a day
16	*Mangifera indica* L.	Anacardiaceae	Mangga	Leaf	Decoction	50 grams once a day
17	*Momordica charantia* L.	Cucurbitaceae	Pare	Leaf	Decoction	50 grams once a day
18	*Morinda citrifolia* L.	Rubiaceae	Mengkudu	Fruit	Infusion	100 grams once a day
19	*Moringa oleifera* Lamk.	Moringaceae	Kelor	Leaf	Decoction	50 grams once a day
20	*Nephelium lappaceum* L.	Sapindaceae	Rambutan	Leaf	Decoction	80 grams once a day
21	*Orthosiphon aristatus* (Blume) Miq.	Lamiaceae	Kumis Kucing	Leaf	Decoction	10 grams once a day
22	*Phaleria macrocarpa* (Scheff.) Boerl)	Thymelaceae	Mahkota Dewa	Fruit	Decoction	50 grams once a day
23	*Phyllanthus niruri* L.	Phyllanthaceae	Meniran	Leaf	Decoction	10 grams once a day
24	*Piper betle* L.	Piperaceae	Sirih	Leaf	Decoction	50 grams once a day
25	*Punica granatum L.*	Lythraceae	Delima	Leaf	Decoction	10 grams once a day
26	*Syzygium aromaticum* (L.) Merrill & Perry	Myrtaceae	Cengkeh	Seed	Decoction	100 grams once a day
27	*Syzygium cumini* (L.) Skeels	Myrtaceae	Jamblang	Leaf	Infusion	10 grams once a day
28	*Syzygium polyanthum* (Wight) Walpers	Myrtaceae	Salam	Leaf	Decoction	50 grams once a day
29	*Tinospora crispa* L.	Menispermaceae	Baratawali	Leaf	Decoction	20 grams once a day
30	*Zingiber officinale* Rosc.	Zingiberaceae	Jahe	Rhizome	Decoction	50 grams once a day

CONCLUSIONS

The results of this research confirm that people in the Middle Bogor Region still rely heavily on medicinal plants for their health care system, especially for the treatment of diarrhea with the most frequently used parts of the leaves and their use in decoctions and infusions.

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