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ETHNOBOTANICAL SURVEY OF MEDICINAL PLANTS USED TO TREAT DIARRHEA IN THE CIBATU REGION, PURWAKARTA, WEST JAVA, INDONESIA

Herdiyansah, Shelina Tri Ananda, Fhisna Ayu Faradina, Azhar Atiiqoh, Revatania Putri Khoirunnisa, Rafly Izza Pirdaus, Dedeh Deswita, Farras Farisha Maghfira, Dewi Hartati, Rifki Abdilah, Adelia Putri Pratiwi, Ivan Yusup Bastian, Nurhabibah, Rida Nazah, Reffa Witny Aoulia, Lena Rokana Mende Bancin, Maulana Yusuf Alkandahri*

Faculty of Pharmacy, Universitas Buana Perjuangan Karawang, Karawang, West Java, Indonesia.

***Corresponding Author: Maulana Yusuf Alkandahri**

Faculty of Pharmacy, Universitas Buana Perjuangan Karawang, Karawang, West Java, Indonesia.

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ABSTRACT

Diarrhea is a cause of morbidity and mortality, especially in children. Patients with diarrhea have been suffering from limited treatment options due to poor drug tolerance, side effect, and multi-drug resistance to almost all the current drug treatments. Therefore, it is important to search for a new therapeutic medicine that can effectively prevent the disease and safe. This research aims to document and preserve the use of ethnomedicinal to treat diarrhea by communities in the Cibatu Region, Purwakarta, West Java, Indonesia. Fieldwork was carried out from April to May 2026 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 there are 30 plant species commonly used by people in the Cibatu Region for diarrhea treatment. Among the various plant parts used, leaves (63.3%) are most frequently used in making medicines, followed by rhizomes (20%), fruit (10%), stems, and rhizomes (3.3% respectively). Meanwhile, the preparation methods most frequently used were decoction (53.3%) and infusion (46.7%). The results of this research confirm that people in the Cibatu 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, Cibatu Region, Diarrhea.

INTRODUCTION

Diarrhea is clinically defined as the passage of three or more loose or watery stools per day, indicating an abnormal increase in stool frequency, volume, and fluidity.[1] It is a complex physiological response typically classified into four distinct mechanisms: osmotic diarrhea, caused by an unabsorbed osmotic load; secretory diarrhea, resulting from active electrolyte secretion.[2] While exudative diarrhea results from intestinal inflammation, motility-related diarrhea stems from accelerated transit times that bypass the gut's ability to absorb nutrients and fluids.[3,4] Diarrhea poses a significant health challenge globally, impacting populations across all regions, with a particular emphasis on low- and middle-income countries.[5] The highest mortality rates have shifted geographically from Asia to Africa over the last decade, with Sub-Saharan Africa now bearing the largest death toll.[6] Nearly 1.7 billion children around the world get diarrheal disease every year.[5] The main goal in treating diarrhea is to maintain hydration and counteract electrolyte loss, preventing complications.[7] Anticholinergic agents such as methscopolamine, atropine, glycopyrrolate, and propantheline are effective for diarrhea related to

irritable bowel syndrome (IBS). Additionally, antisecretory like loperamide, diphenoxylate, and bismuth subsalicylate enhance absorption and decrease gastrointestinal water secretion.[8,9] Traditional medicine is commonly used in developing countries for treating various conditions, including diarrhea, yet it has received limited research attention in Indonesia. Efforts to explore the contributions of TM practices in disease management and the discovery of potential plant extracts through rigorous efficacy and safety evaluations remain limited.[10,11] One of the Region in Indonesia that still uses herbal plants as an alternative treatment, especially for treating diarrhea, is Cibatu Region. This research aims to obtain detailed information about the use of herbal plants for alternative therapy for diarrhea in Cibatu Region, Purwakarta, West Java, Indonesia using a field survey method.

MATERIALS AND METHODS

Study Area

Cibatu is located in Purwakarta Regency, West Java, Indonesia, with an area of 56.50 km^2. This area has an altitude of 81 meters above sea level with an average maximum air temperature of 28°C and a minimum of 17°C (humidity: approximately 48% – 82%). Moreover, it is located between 06°32′ 18.83″ South Latitude and 107°30′ 40″ East Longitude. This region is a tropical climate area that is mostly inhabited by Sundanese tribes (98%) and other tribes (2%). Vegetation in the study area is in humid conditions with an average rainfall of 3,093 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 April to May 2026 in the Cibatu Region, Purwakarta, 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 (e.g., infusion, paste, juice and decoction) of all collected ethnomedicinal plants was 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.[12] The plant types obtained were grouped into families according to the Cronquist classification system, except for Pteridophyta and Gymnospermae.[13] 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

Diarrhea is a gastrointestinal condition characterized by frequent passage of loose or watery stools and may result from infectious agents, intestinal inflammation, altered gastrointestinal motility, or disturbances in intestinal fluid and electrolyte transport. Medicinal plants may potentially influence these processes through several pharmacological mechanisms, including antimicrobial activity, inhibition of intestinal secretion, modulation of gastrointestinal motility, antispasmodic effects, and protection against intestinal inflammation.[14,15] This research revealed that 30 plant species are commonly used by local people to treat diarrhea (Table 1). Among the various plant parts used, leaves (63.3%) are most frequently used in making medicines, followed by rhizomes (20%), fruit (10%), stems, and rhizomes (3.3% respectively). Meanwhile, the preparation methods most frequently used were decoction (53.3%) and infusion (46.7%).

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

No	Species	Family	Local name	Parts used	Mode of administration	Dosage of use
1	*Allium cepa* L.	Amaryllidaceae	Bawang Bombai	Rhizome	Decoction	20 grams once a day
2	*Allium sativum* L.	Alliaceae	Bawang Putih	Rhizome	Infusion	10 grams once a day
3	*Alpinia galanga* L.	Zingiberaceae	Lengkuas	Rhizome	Decoction	10 grams once a day
4	*Annona muricata* L.	Annonaceae	Sirsak	Leaf	Infusion	100 grams once a day
5	*Annona squamosa* L.	Annonaceae	Srikaya	Leaf	Decoction	10 grams once a day
6	*Averrhoa carambola* L.	Oxalidaceae	Belimbing	Fruit	Infusion	10 mL once a day
7	*Carica papaya* L.	Caricaceae	Pepaya	Leaf	Decoction	50 grams once a day
8	*Cinnamomum verum* J.Presl	Lauraceae	Kayu Manis	Stem	Decoction	10 grams once a day
9	*Curcuma longa* L.	Zingiberaceae	Kunyit	Rhizome	Infusion	100 grams once a day
10	*Cymbopogon nardus*	Poaceae	Sereh Wangi	Leaf	Infusion	50 grams once a day
11	*Durio zibethinus* Murr.	Bombacaceae	Durian	Leaf	Infusion	10 grams once a day
12	*Elephantopus scaber* L.	Asteraceae	Tapak Liman	Leaf	Decoction	20 grams once a day

13	*Garcinia mangostana* L.	Clusiaceae	Manggis	Rind	Infusion	75 mL once a day
14	*Kaempferia galanga* L	Zingiberaceae	Kencur	Rhizome	Infusion	20 grams once a day
15	*Momordica charantia* L.	Cucurbitaceae	Pare	Leaf	Decoction	10 grams once a day
16	*Morinda citrifolia* L.	Rubiaceae	Mengkudu	Fruit	Infusion	100 grams once a day
17	*Moringa oleifera* Lamk.	Moringaceae	Kelor	Leaf	Decoction	20 grams once a day
18	*Morus* L.	Moraceae	Murbei	Leaf	Infusion	50 grams once a day
19	*Musa paradisiaca* L.	Musaceae	Pisang	Leaf	Infusion	20 grams once a day
20	*Ocimum basilicum* L.	Lamiaceae	Kemangi	Leaf	Decoction	30 grams once a day
21	*Orthosiphon stamineus* Benth	Lamiaceae	Kumis Kucing	Leaf	Infusion	40 mL once a day
22	*Pandanus amaryllifolius* Roxb.	Pandanaceae	Pandan Wangi	Leaf	Decoction	10 grams once a day
23	*Phaleria macrocarpa* (Scheff.) Boerl)	Thymelaceae	Mahkota Dewa	Fruit	Decoction	50 grams once a day
24	*Phyllanthus acidus* (L.) Skeels	Phyllanthaceae	Cermai	Leaf	Infusion	5 grams once a day
25	*Phyllanthus niruri* L.	Phyllanthaceae	Meniran	Leaf	Decoction	10 grams once a day
26	*Piper betle* L.	Piperaceae	Sirih	Leaf	Decoction	50 grams once a day
27	*Psidium guajava* L.	Myrtaceae	Jambu biji	Leaf	Decoction	50 grams once a day
28	*Sechium edule* (Jacq.) Swartz	Cucurbitaceae	Labu Siam	Leaf	Infusion	10 grams once a day
29	*Syzygium polyanthum* (Wight) Walpers	Myrtaceae	Salam	Leaf	Decoction	25 grams once a day
30	*Zingiber officinale* Rosc.	Zingiberaceae	Jahe	Rhizome	Decoction	50 grams once a day

CONCLUSIONS

In conclusion, the ethnomedicinal inventory documents 30 plant species and provides a foundation for investigating traditional plant-based approaches to gastrointestinal health. The findings highlight the value of local medicinal plant knowledge as a source of research hypotheses and potential pharmacological candidates. However, systematic phytochemical, pharmacological, toxicological, and clinical investigations are necessary to identify the most promising species, establish their mechanisms of action, determine safe and effective doses, and assess their potential role in evidence-based management of diarrhea.

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