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# AN ETHNOBOTANICAL SURVEY OF MEDICINAL PLANTS USED TO TREAT DIARRHEA IN THE PABUARAN REGION, SUBANG, WEST JAVA, INDONESIA

**Muhammad Azriel Aulia, Alya Dila Afifa, Andini, Delia Azma Febiyanti, Dine Julianti, Elma Tiana, Juliana Eddis Indiani, Mahatma Adha Sugwidiya, Nadia Siti Syarifah, Nabila Tsalist Hanifah, Navelga Maghfira Idzani, Risda Aulia Khairani, Rima Anggera Puspita, Satria Emmir Rafhsanzani, Siti Nur Syifa, Siti Nurhamidah Hardiana, 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 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. This research aims to document and preserve the use of ethnomedicinal to treat diarrhea by communities in the Pabuaran Region, Subang, 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 Pabuaran 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 Pabuaran 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, Pabuaran Region, Diarrhea.

## INTRODUCTION

Diarrhea is a gut disorder characterized by passage of three or more loose or liquid stools per day and is one of the leading cause of child mortality and morbidity. Three clinical types namely acute watery, acute bloody and persistent diarrhea have been defined depending upon the duration and symptoms.[1] Globally, one in ten deaths (about 8,00,000) of those under five are due to diarrhea.[2] Among developing world, higher prevalence of diarrhea related deaths occur among children in sub-saharan and south Asian countries (78%).[3] More than 2.8 billion episodes of diarrhoea per year have been estimated in adolescents, adults and children aged above 5 years.[4] Pathophysiology of diarrheal disease is multifactorial involving poor absorption, intestinal microbiota, gut motility, hypersensitivity, microbial infection, metabolism error, chemical irritation, immune system, genetic factors and various secretory stimuli such as, bacterial enterotoxins, hormones generated by endocrine neoplasms, dihydroxy bile acids, hydroxylated fatty acids and inflammatory mediators.[5] Prevention and treatment strategies for diarrheal diseases include exclusive breastfeeding, zinc supplementation, better hygiene, immunization, oral rehydration therapy and antibiotics.[6] Despite the global decline in mortality (>50%) from 2000 till 2013, the disease still carries a

high burden of morbidity. Treatment of acute infectious diarrhea includes antibiotics such as tetracycline, ciprofloxacin, norfloxacin, fleroxacin, cinoxacin, erythromycin, metronidazole, ampicillin, amoxycyline, doxycycline, vancomycin, and paromomycin.[1] However, use of antibiotics is often associated with depletion of beneficial gut and mucosal micro-organism,[7], immuno-suppression,[8] and allergic reactions.[9] Emergence of antibiotic resistant pathogenic strains is also observed over long-term use which results in spread and stabilization of resistant bacteria and resistance genes.[10] This may sometimes also lead to overgrowth of enteropathogens such as *Clostridium difficile*, termed as antibiotic-associated diarrhea.[11]

Research to obtain new drugs to anti-diarrhea originating from natural ingredients continues to be carried out, one of which is through exploring active compounds from natural ingredients, especially medicinal plants which have traditionally been used by people to diarrhea in various countries, especially Indonesia.[12,13] One of the Region in Indonesia that still uses herbal plants as an alternative treatment, especially for diarrhea, is Pabuaran Region. This research aims to obtain detailed information about the use of herbal plants for alternative therapy for diarrhea in Pabuaran Region, Subang, West Java, Indonesia using a field survey method.

## MATERIALS AND METHODS

### Study Area

Pabuaran is located in Subang Regency, West Java, Indonesia, with an area of 75.37 $km^2$. This area has an altitude of 50 meters above sea level with an average maximum air temperature of 31°C and a minimum of 21°C (humidity: approximately 52% – 54%). Moreover, it is located between 06°24′35″ South Latitude and 107°35′12″ East Longitude. This region is a tropical climate area that is mostly inhabited by Sundanese tribes (90%) and other tribes (10%). Vegetation in the study area is in humid conditions with an average rainfall of 2,000 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 Pabuaran Region, Subang, 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.[14] The plant types obtained were grouped into families according to the Cronquist classification system, except for Pteridophyta and Gymnospermae.[15] 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 characterized by an increase in stool frequency and water content and may result from intestinal infections, enterotoxin production, inflammation, altered gastrointestinal motility, or impaired intestinal absorption. Several physiological mechanisms are therefore relevant to antidiarrheal drug development, including the inhibition of enteric pathogens, reduction of excessive intestinal secretion, modulation of gastrointestinal smooth-muscle contractions, and protection of the intestinal mucosa.[16,17] 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%). Most of the listed plants were prepared as decoctions or infusions, suggesting that water-based preparations are an important component of local medicinal practice. These methods may extract polar constituents, including certain tannins, flavonoids, glycosides, and other water-soluble compounds.[18]

**Table 1: Ethnomedicinal plants, local name, part used, mode of administration, and dosage uses in Pabuaran, Subang, 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 | 5 grams once a day |
| 3 | *Alpinia galanga* L. | Zingiberaceae | Lengkuas | Rhizome | Decoction | 20 grams once a day |
| 4 | *Annona muricata* L. | Annonaceae | Sirsak | Leaf | Infusion | 10 grams once a day |
| 5 | *Annona squamosa* L. | Annonaceae | Srikaya | Leaf | Decoction | 20 grams once a day |
| 6 | *Averrhoa carambola* L. | Oxalidaceae | Belimbing | Fruit | Infusion | 50 mL once a day |
| 7 | *Centella asiatica* L. | Apiaceae | Pegagan | Leaf | Decoction | 50 grams once a day |
| 8 | *Cinnamomum verum* J.Presl | Lauraceae | Kayu Manis | Stem | Decoction | 150 grams once a day |
| 9 | *Curcuma longa* L. | Zingiberaceae | Kunyit | Rhizome | Infusion | 10 grams once a day |
| 10 | *Cymbopogon nardus* | Poaceae | Sereh Wangi | Leaf | Infusion | 10 grams once a day |
| 11 | *Durio zibethinus* Murr. | Bombacaceae | Durian | Leaf | Infusion | 50 grams once a day |
| 12 | *Elephantopus scaber* L. | Asteraceae | Tapak Liman | Leaf | Decoction | 10 grams once a day |
| 13 | *Garcinia mangostana* L. | Clusiaceae | Manggis | Rind | Infusion | 50 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 | 50 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 | 100 grams once a day |
| 18 | *Morus* L. | Moraceae | Murbei | Leaf | Infusion | 10 grams once a day |
| 19 | *Musa paradisiaca* L. | Musaceae | Pisang | Leaf | Infusion | 50 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 | 80 grams once a day |
| 24 | *Phyllanthus acidus* (L.) Skeels | Phyllanthaceae | Cermai | Leaf | Infusion | 50 grams once a day |
| 25 | *Phyllanthus niruri* L. | Phyllanthaceae | Meniran | Leaf | Decoction | 50 grams once a day |
| 26 | *Polyscias scutellaria* (Burm.f.) Fosberg | Araliaceae | Mangkokan | Leaf | Decoction | 10 grams once a day |
| 27 | *Psidium guajava* L. | Myrtaceae | Jambu biji | Leaf | Decoction | 100 grams once a day |
| 28 | *Syzygium cumini* (L.) Skeels | Myrtaceae | Jamblang | Leaf | Infusion | 10 grams once a day |
| 29 | *Syzygium polyanthum* (Wight) Walpers | Myrtaceae | Salam | Leaf | Decoction | 50 grams once a day |
| 30 | *Zingiber officinale* Rosc. | Zingiberaceae | Jahe | Rhizome | Decoction | 100 grams once a day |

## CONCLUSIONS

In conclusion, the ethnomedicinal survey in Pabuaran, Subang, West Java, Indonesia, documented 30 medicinal plant species that represent a valuable resource for investigating traditional approaches to antidiarrheal. Nevertheless, their efficacy cannot be established from ethnomedicinal records alone. Additional phytochemical, pharmacological, toxicological, and clinical research is essential to determine which plants can provide safe, effective, and scientifically validated antidiarrheal agents.

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