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ETHNOBOTANICAL SURVEY OF MEDICINAL PLANTS USED TO TREAT ALLERGIC IN THE CIPEUNDEUY REGION, SUBANG, WEST JAVA, INDONESIA

Muhammad Azriel Aulia, Alya Dila Afifa, Andini, Delia Azma Febiyanti, Mahatma Adha Sugwidiya, Nadia Siti Syarifah, Nabila Tsalist Hanifah, Navelga Maghfira Idzani, Risda Aulia Khairani, Rima Anggera Puspita, Satria Emmir Rafshanzani, Siti Nur Syifa, Siti Nurhamidah Hardiana, Rizal Iskandar, Callista Putri Ryanna, Amira Ramadani, 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

Allergic rhinitis, asthma, atopic dermatitis, and atopic eczema are among the common causes of chronic ill health. It is well known that IgE-dependent mast cell activation is associated with the allergic diseases. This research aims to document and preserve the use of ethnomedicinal to treat allergic by communities in the Cipeundeuy 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 30 plant species are commonly used by people in the Cipeundeuy Region to treat allergic. Among the various plant parts used, leaves (56.7%) are most frequently used in making medicines, followed by rhizomes (20.0%), seed (10.0%), fruit (6.7%), stem, and rind (respectively 3.3%). Meanwhile, the most frequently used preparation methods were decoction (80.0%) and infusion (20.0%). The results of this research confirm that people in the Cipeundeuy Region still rely heavily on medicinal plants for their health care system, especially for the treatment of allergic with the most frequently used parts of the leaves and their use in decoctions and infusions.

KEYWORDS: Traditional medicine, Ethnomedicinal plants, Cipeundeuy Region, Allergic.

INTRODUCTION

Allergic disorders are type I hypersensitivity reactions, which are IgE-mediated immune responses against diverse antigens/allergens. This reaction is immediately provoked, and allergen/IgE-bound mast cells and basophils are essential components in atopy.[1,2] In immunological cells, IgE is crosslinked to FceRI, which activates signaling cascades. Src family kinases, Lyn and Fyn, are recruited to immunoreceptor tyrosine-based activation motifs (ITAM) in FcεRI β and γ chains, with sequential phosphorylation of tyrosine residues of the chains. Activated Lyn transduces the signals to Syk kinase, which results in a linker for the activation of T cells (LAT). The reaction is required for the activation of phospholipase C (PLC)γ, which modulates Ca^{2+} mobilization and protein kinase C (PKC) activity. These signals lead to mast cell granulation or transcription factor activation for inflammatory cytokines such as IL-1β, IL-4, IL-5, and TGF-β.[3] IL-1β plays critical roles in inflammation, contact hypersensitivity, and atopic dermatitis. Allergen-mediated inflammasome induces the secretion of IL-1β, which exacerbates symptoms.[4] IL-4 regulates T-cell development and IgE production, and IL-5 is considered a hallmark of atopic diseases.[5] TGF-

β modulates leukocyte chemotaxis and Th17 cell differentiation.[6] Under uncertain conditions to overproduce IL-2, IL-10, and TGF-β from T cells and macrophages, the acute phase of allergic inflammation can be switched to chronic allergy and atopic dermatitis conditions, under which T-cell proliferation is increased, IL-4, IL-5, and GM-CSF are overproduced, and IgE and IgM are highly produced.[7] Mast cells or basophils also produce histamine, the main contributor of allergic responses, which are bound to histamine receptors H1, H2, H3, or H4.[8] Histamine mediates inflammatory cytokine secretion and promotes vascular expansion and tissue changes.[9] β-Hexosaminidases are necessary for histamine release. The enzymes are simultaneously degranulated with histamine in mast cells, a known biomarker of allergic reaction. Lipoxygenases are also involved in histamine release through arachidonic acid metabolism.[10] Currently, research to obtain new anti-allergic drugs derived from natural materials is continuing, one of which is through the exploration of active compounds from natural materials, especially medicinal plants that have traditionally been used by communities to treat allergic in various regions in Indonesia.[11-13] One of the Region that still uses herbal plants as an alternative treatment for allergic is Cipeundeuy Region. This research aims to obtain detailed information about the use of herbal plants for alternative therapy for allergic in Cipeundeuy Region, Subang, West Java, Indonesia using a field survey method.

MATERIALS AND METHODS

Study Area

Cipeundeuy is located in Subang Regency, West Java, Indonesia, with an area of 98.06 km^2. This area has an altitude of 50 meters above sea level with an average maximum air temperature of 37°C and a minimum of 22°C (humidity: approximately 39%). Moreover, it is located between 06°30′50″ South Latitude and 107°34′29″ 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 4,000 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 Cipeundeuy 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 (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.[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

Allergic diseases, including allergic rhinitis, atopic dermatitis, allergic asthma, and food allergies, are characterized by inappropriate immune responses to otherwise harmless environmental or food antigens. The pathophysiology of allergic reactions involves complex immunological mechanisms, particularly immunoglobulin E (IgE)-mediated hypersensitivity, mast cell activation, histamine release, and the production of pro-inflammatory cytokines. During allergic sensitization, allergen-specific Th2 immune responses stimulate B cells to produce IgE antibodies. These antibodies subsequently bind to high-affinity IgE receptors (FcεRI) on mast cells and basophils. Upon subsequent allergen exposure, cross-linking of IgE molecules triggers the release of histamine, leukotrienes, prostaglandins, and other inflammatory mediators, resulting in allergic symptoms.[16] This research revealed that 30 plant species are commonly used by local people to treat allergic (Table 1). Among the various plant parts used, leaves (56.7%) are most frequently used in making medicines, followed by rhizomes (20.0%), seed (10.0%), fruit (6.7%), stem, and rind (respectively 3.3%). Meanwhile, the most frequently used preparation methods were decoction (80.0%) and infusion (20.0%).

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

No	Species	Family	Local name	Parts used	Mode of administration	Dosage of use
1	*Abrus precatorius* L.	Fabaceae	Saga	Leaf	Decoction	50 grams once a day
2	*Allium sativum* L.	Alliaceae	Bawang Putih	Rhizome	Infusion	100 grams once a day
3	*Alpinia purpurata* K. Schum.	Zingiberaceae	Lengkuas	Rhizome	Decoction	80 grams once a day
4	*Andrographis paniculata* Nees.	Acanthaceae	Sambiloto	Leaf	Decoction	100 grams once a day
5	*Annona muricata* L.	Annonaceae	Sirsak	Leaf	Infusion	100 grams once a day
6	*Anredera cordifolia* (Ten.) Steenis.	Basellaceae	Binahong	Leaf	Decoction	50 grams once a day
7	*Apium graveolens* L.	Apiaceae	Seledri	Leaf	Decoction	100 grams once a day
8	*Cayratia trifolia* L.	Vitaceae	Galing-galing	Leaf	Decoction	100 grams once a day
9	*Cinnamomum verum* J.Presl.	Lauraceae	Kayu Manis	Stem	Decoction	100 grams once a day
10	*Curcuma longa* L.	Zingiberaceae	Kunyit	Rhizome	Infusion	50 grams once a day
11	*Curcuma zanthorrhiza* Roxb.	Zingiberaceae	Temulawak	Rhizome	Decoction	50 grams once a day
12	*Eleutherine palmifolia* (L.) Merr.	Iridaceae	Bawang Dayak	Leaf	Decoction	100 grams once a day
13	*Garcinia mangostana* L.	Clusiaceae	Manggis	Rind	Infusion	50 grams once a day
14	*Jatropha gossypiifolia* L.	Euphorbiaceae	Jarak	Leaf	Decoction	10 grams once a day
15	*Kaempferia galanga* L.	Zingiberaceae	Kencur	Rhizome	Infusion	10 grams once a day
16	*Momordica charantia* L.	Cucurbitaceae	Pare	Leaf	Decoction	50 grams once a day
17	*Morinda citrifolia* L.	Rubiaceae	Mengkudu	Fruit	Infusion	10 grams once a day
18	*Moringa oleifera* Lamk.	Moringaceae	Kelor	Leaf	Decoction	50 grams once a day
19	*Myristica fragrans* Houtt.	Myristicaceae	Pala	Seed	Decoction	50 grams once a day
20	*Nigella sativa* L.	Ranunculaceae	Jinten Hitam	Seed	Decoction	10 grams once a day
21	*Ocimum tenuiflorum* L.	Lamiaceae	Kemangi	Leaf	Decoction	20 grams once a day
22	*Orthosiphon aristatus* (Blume) Miq.	Lamiaceae	Kumis Kucing	Leaf	Decoction	100 grams once a day
23	*Peperomia pellucida* Kunth.	Piperaceae	Sirih Cina	Leaf	Decoction	100 grams once a day
24	*Persea americana* Mill.	Lauraceae	Alpukat	Seed	Decoction	50 grams once a day
25	*Phaleria macrocarpa* (Scheff.) Boerl).	Thymelaceae	Mahkota Dewa	Fruit	Decoction	50 grams once a day
26	*Piper betle* L.	Piperaceae	Sirih	Leaf	Decoction	10 grams once a day
27	*Piper crocatum* Ruiz & Pav	Piperaceae	Sirih Merah	Leaf	Decoction	15 grams once a day
28	*Tinospora crispa* L.	Menispermaceae	Baratawali	Leaf	Decoction	10 grams

						once a day
29	*Vitex trifolia* L.	Lamiaceae	Legundi	Leaf	Decoction	50 grams once a day
30	*Zingiber officinale* Rosc.	Zingiberaceae	Jahe	Rhizome	Decoction	100 grams once a day

CONCLUSIONS

This study identified 30 medicinal plant species traditionally utilized by the community in Cipeundeuy, Subang, West Java, Indonesia. These plants represent valuable ethnomedicinal resources with potential pharmacological applications, particularly in the development of natural products for managing allergic disorders. However, the present study is based on ethnomedicinal documentation and does not provide direct experimental evidence of anti-allergic efficacy. Therefore, further phytochemical, *in vitro*, *in vivo*, and toxicological investigations are necessary to establish their specific mechanisms of action, therapeutic effectiveness, and safety. Overall, this study provides an important scientific foundation for integrating traditional medicinal knowledge with modern pharmacological research to explore and develop potential plant-based anti-allergic agents.

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