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Ethnopharmacy and Traditional Knowledge Study with a Family Use Value Approach in Sumberbrantas Village, Bumiaji District, Batu City, Indonesia

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ABSTRACT

Indonesia is recognized as one of the world's most biodiverse countries, harboring approximately 17% of global plant and animal species within its territory. This remarkable biodiversity supports a wealth of medicinal plants that have been traditionally utilized by local communities for generations. However, rapid modernization and urbanization have led to a decline in the transmission of ethnobotanical knowledge, threatening the continuity of traditional healing practices. This study investigates the ethnopharmacological practices in Sumberbrantas Village, Bumiaji District, Batu City, East Java, using the Family Use Value (FUV) approach to identify the most utilized plant families in traditional medicine. Data were collected through structured interviews with 70 respondents selected using purposive and snowball sampling techniques. The Family Use Value (FUV) and Fidelity Level (FL) of various plant species were analyzed to determine their ethnomedicinal significance. Results indicate that the *Zingiberaceae* and *Euphorbiaceae* families exhibit the highest FUV (0.45), reflecting their dominant role in traditional healing practices, whereas the *Oxalidaceae* family shows the lowest FUV (0.01). The FL analysis reveals that *Allium cepa* (shallot) has the highest fidelity level (75%), demonstrating its high consistency of use in treating multiple ailments across respondents. This research provides critical insights into the preservation of ethnomedicinal knowledge and the sustainable use of medicinal plant resources. The novelty of this study lies in its application of a quantitative ethnobotanical index (FUV and FL) within a localized Indonesian context Sumberbrantas Village where such analyses have rarely been conducted. By integrating community-level ethnopharmacological data with statistical quantification, this study offers a replicable framework for identifying culturally significant plant families and prioritizing species for conservation and herbal development. The findings thus serve as a valuable reference for biodiversity conservation, sustainable utilization of medicinal flora, and the integration of traditional plant-based knowledge into modern healthcare and community empowerment strategies.

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INTRODUCTION

Indonesia is one of the world's most biodiverse countries, serving as a habitat for a vast array of flora and fauna. It is estimated that 17% of the world's plant and animal species can be found in Indonesia (Supeni, 1994; Suryana, 2009). This extraordinary biodiversity is primarily attributed to Indonesia's tropical climate, characterized by high rainfall levels. According to Nandika (2005), Indonesia's biodiversity is also influenced by its geographical position along the equator, its extensive archipelagic nature, and its location between the Asian and Australian continents. These factors contribute to the formation of unique ecological characteristics, particularly in the form of tropical rainforest ecosystems that support a diverse range of plant and animal species.

One of the most significant aspects of Indonesia's floral diversity is the abundance of medicinal plants. Medicinal plants refer to raw plant materials that remain unprocessed and uncontaminated, traditionally harvested and prepared for consumption as natural remedies. These plants play a crucial role in maintaining health, preventing, and treating various ailments, including chronic diseases, degenerative conditions, and tumors (Katno, 2008).

Since ancient times, Indonesian ancestors have practiced traditional medicine by utilizing plants found in their surroundings. This invaluable knowledge has been passed down through generations (Muhlisah, 2007). However, the rapid advancement of modern medicine and pharmaceutical sciences has led to a perception that traditional medicine is outdated. As a result, many people now prefer instant medical solutions and frequently purchase pharmaceutical drugs without a prescription, despite the potential side effects of synthetic medications (Almomani et al., 2023).

Excessive reliance on chemically-based drugs can lead to various adverse effects. In contrast, herbal medicine derived from plants is often more affordable and generally has fewer side effects. According to Meliki and Lovadi (2013), medicinal plants are widely available in local environments, often growing wild in fields, plantations, or along roadsides, making them easily accessible without financial constraints. Additionally, medicinal plants can be cultivated domestically. However, according to Batoro (2013), valuable knowledge regarding the utilization of medicinal plants and their diverse species is gradually fading, threatening the preservation of traditional wisdom before it can be thoroughly documented.

Sumberbrantas is a village located on the southwestern slopes of Mount Arjuno-Welirang, east of Mount Anjasmoro, and south of Mount Welirang. This mountainous region boasts highly fertile agricultural land, enabling the local population predominantly farmers to produce high-quality vegetables and horticultural crops. True to its name, Sumberbrantas serves as the primary source of the Brantas River, which flows through multiple districts and cities in East Java (Muttaqin, 2016). Due to its distinctive natural landscape, the village has developed two major tourism sectors: the Arboretum, which marks the river's source, and natural hot spring attractions. These sites possess substantial potential to attract visitors and could position Sumberbrantas as a future tourism destination in Batu City (Muttaqin, 2016).

Furthermore, active community participation plays a pivotal role in the development of Sumberbrantas. Residents not only serve as key actors in development projects but also contribute essential resources, such as construction tools and transportation equipment (Neksen & Sumprojo, 2016). However, land-use changes in the Sumberbrantas watershed (DAS) have been occurring since the early 20th century, initially at a gradual pace. The rate of land conversion accelerated in the 1960s and peaked during the 1998–1999 reform period. The upstream Brantas watershed is now in a concerning state due to widespread illegal logging activities. Since the 1980s, forested areas in this region have declined by approximately 33%.

According to Jadid et al. (2020), the interaction between humans and plants has long been recognized as a fundamental aspect of human civilization, particularly in the field of medicine. Documenting the use of medicinal plants through ethnobotanical studies and inventory research enables the development of contemporary medical treatments while also supporting conservation efforts, especially as many areas within the Sumberbrantas watershed are facing ecological degradation. Ethnobotanical studies highlight the interconnectedness between cultural traditions and plant resources, both directly and indirectly. These studies serve as vital tools for recording traditional knowledge on plant utilization for various purposes, including food, medicine, construction, cultural practices, dye production, and other daily necessities. Preserving local knowledge regarding medicinal plant use is crucial for maintaining biodiversity and supporting the domestication of plant species with significant ecological and economic value (Lestari et al., 2024).

The family level (familia) in plant taxonomy plays a critical role in ethnopharmacology, as it provides insight into the phylogenetic relationships among medicinal plant species. Understanding plant families helps in identifying usage patterns of medicinal plants by communities and their pharmacological potential. Certain plant families are distinguished by their secondary metabolites, such as alkaloids, flavonoids, and saponins, which contribute to specific biological activities in traditional medicine (Harborne, 1996). Additionally, certain families exhibit strong ecological correlations, influencing the distribution and availability of medicinal plants in particular regions (Batoro, 2013). By assessing the utility value of plant families, this study aims to provide a more systematic understanding of medicinal plant utilization, uncover community preferences for specific families, and support the conservation of species with significant medicinal and ecological value (Setiawan & Qiptiyah, 2014).

Given these circumstances, research focusing on the inventory and documentation of medicinal plants is essential to support the advancement of ethnobotany in Sumberbrantas Village, Bumiaji District, as part of Batu City. This study, titled "Ethnopharmacy and Traditional Knowledge Study with a Family Utility Value Approach in Sumberbrantas Village, Bumiaji District, Batu City, East Java," aims to document the traditional use of medicinal plants by the local community. The findings from this research will serve as a valuable reference for regional governments in their efforts to conserve medicinal plant species and preserve traditional knowledge.

MATERIALS AND METHOD

Study area. The area selected for this study includes Sumberbrantas Village, which is part of Bumiaji District, Batu City, East Java (Figure 1) figure in the result. The majority of the residents in these seven villages rely on agriculture and the tourism sector for their livelihoods.

Procedures. The research methodology involved observation and interviews (Amrul et al., 2017). The sampling method used was purposive sampling, a technique in which samples are selected based on specific criteria (Mukhsin, 2017). According to Ida, this method is widely used in ethnobotanical research, particularly with respondents who have knowledge of or utilize local plants as medicine. Interviews were conducted with 70 individuals selected from household heads to gather and identify information regarding plant species, their uses, the parts utilized, and traditional medicinal applications. All interviews were conducted using a structured questionnaire. Respondents were selected using the Snowball Sampling technique, which begins by identifying a key informant (key person), with subsequent respondents chosen based on referrals from the previous ones (Jadid et al., 2020).

Data analysis. This study employs a descriptive quantitative approach. Data obtained from respondent interviews were analyzed using the Family Use Value (FUV) and Fidelity Level (FL) calculations.

Family Use Value (FUV). According to Jadid et al. (2020), FUV is calculated to determine the use value of a plant family utilized for medicinal purposes by the residents of Sumberbrantas Village. It is computed using the formula:

$$FUV = \frac{\sum UV_s}{(n_s)}$$

Explanation:

- FUV = Family Use Value
- Ns = Total number of species within a specific family (Calzada & Bautista, 2020).

Fidelity Level (FL)

According to Jadid et al. (2020), the relative frequency of plant usage is calculated using the Fidelity Level (FL) formula. FL represents the percentage of informants who reported using a particular plant species for a specific medicinal purpose. It reflects people's preference for certain plant species in treating specific conditions. The calculation follows this formula:

$$FL(\%) = \frac{Np}{N} x\ 100$$

(Yeung *et al.*, 2020).

Explanation:

- FL = Fidelity Level
- Np = Number of respondents who mentioned a species for a specific use
- N = Total number of respondents who mentioned the species for various uses

RESULTS AND DISCUSSION

1. Family Use Value (FUV)

According to Phillips and Gentry (1993) in Hoffman (2007), the calculation of Family Use Value (FUV) is conducted to determine the families of medicinal plants that hold significant value for local communities. Based on the study findings, the 102 identified species were classified into 52 different families **(Table 1)**. The number of species within each family was calculated to determine the use value per family. The study results indicate that the Zingiberaceae and Euphorbiaceae families have the highest family use value, both scoring 0.45 **(Table 1)**. Within the Zingiberaceae family, four plant species are utilized as medicinal plants by the residents of Sumberbrantas Village **(Figure 1)**.

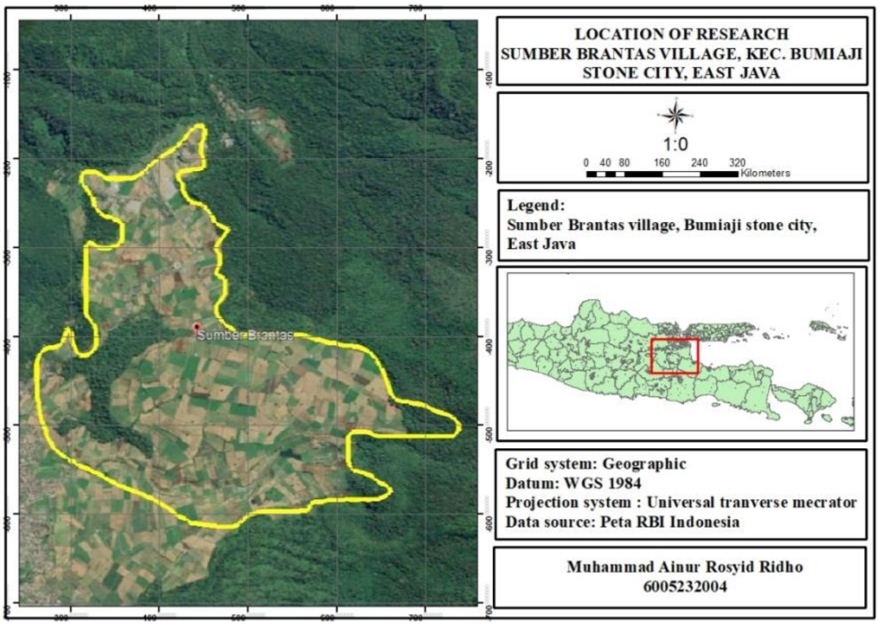

Figure 1. Map of Sumberbrantas Village, Bumiaji, East Java.

Zingiberaceae comprises perennial herbs with rhizomatous roots (Andesmora et al. 2022). The four species commonly used as traditional medicine in Sumberbrantas Village are *Alpinia galanga* (Galangal), *Curcuma longa* (Turmeric), *Kaempferia galanga* (Aromatic Ginger), and *Zingiber officinale* (Ginger) (Meidatuzzahra & Swandayani, 2020). As noted by Fernandi & Nursyahra (2008), the Zingiberaceae family contains active compounds such as flavonoids, saponins, and essential oils. These plants are widely distributed across Indonesia due to the country's tropical climate, which is highly conducive to their growth (Auliani & Sofiyanti, 2014).

Table 1. Use of Plant Types Data from Inventory and Questionnaire Results

Regional Name	Species Name	Family	FUV	FL	Drug	References
Turmeric	*Curcuma longa* L.	Zingiberaceae	0.45	66.60%	High blood pressure, fever, dizziness, cough	Wulandari *et al.,* 2021
Ginger	*Zingiber officinale* Roscoe.	Zingiberaceae	0.45	60%	Dizziness, cough, shortness of breath, rheumatism, nausea	Aryanta, 2019
Galangal	*Alpinia galanga* (L.) Willd.	Zingiberaceae	0.45	50%	Cholesterol and muscle pain	Sumonda *et al.,* 2021
Aromatic ginger	*Kaempferia galanga* var. *latifolia* (Donn ex Hornem.) Donn	Zingiberaceae	0.45	50%	High blood pressure, cholesterol, dizziness, bloating	Othman *et al.,* 2006
Cat's tail	*Acalypha hypsida* L.	Euphorbiaceae	0.45	50%	Headaches, bleeding wounds, worms, and nausea	Okonduru *et al.,* 2021
Poinsettia	*Euphorbia pulcherrima* Willd. ex Klotzsch	Euphorbiaceae	0.45	66.60%	Fever, swollen skin, nausea	Harti *et al.,* 2018
Blood leaf	*Excoecaria cochinchinensis* Müll.Arg	Euphorbiaceae	0.45	83.30%	Fever, blood in urine, bleeding during childbirth, itchy boils, coughing, nausea	Oktariza *et al.,* 2013

Cassava	*Manihot esculenta* Crantz	Euphorbiaceae	0.45	50%	Dizziness, diarrhea	Sastroamidjojo *et al.,* 2001
Ajuga	*Ajuga reptans* var. alba C.Mackintosh	Lamiaceae	0.31	33.30%	Bloody wounds, itchy boils, diarrhea	Toiu *et al.,* 2017
Coleus	*Coleus scutellarioides* Elmer	Lamiaceae	0.31	25%	High blood pressure, fever, cough, asthma	Wahyuningtyas *et al* ., 2016
Black grass jelly	*Mesona chinensis* Benth	Lamiaceae	0.31	75%	High blood pressure, diabetes, stomach acid, bloating	Winarsih *et al.,* 2012
Lemon basil	*Ocimum basilicum* var. *album* (L.) Benth	Lamiaceae	0.31	33.30%	High blood pressure, diabetes, stomach acid, bloating	Zaveri *et al.,* 2011
Cat's whiskers	*Orthosiphon aristatus* (Blume) Miq.	Lamiaceae	0.31	50%	High blood pressure, diabetes, kidney stones, muscle pain	Faramayuda *et al.,* 2021
Purple sage	*Salvia mexicana* L.	Lamiaceae	0.31	50%	Fever, itching, boils	Afonso *et al.,* 2019
Acanthus	*Acanthus ilicifolius* Lour.	Acanthaceae	0.07	33.30%	Liver, cough, sore throat	Handayani *et al.,* 2018
Red purple leaf	*Graptophyllum pictum* (L.) Griff.	Acanthaceae	0.07	66.60%	Cholesterol, sore throat, hemorrhoids	Triyandi *et al.,* 2020
Purple kencana	*Ruellia angustifolia* Sessé & Moc.	Acanthaceae	0.07	100%	Diabetes	Rahmi *et al.,* 2014
Spiny amaranth	*Amaranthus blitum* Rchb. ex Steud.	Amaranthaceae	0.02	50%	High blood pressure, fever, itchy boils, eye medicine	Hadisoebotro, 2016
Beetroot	*Beta vulgaris* L.	Amaranthaceae	0.02	50%	High blood pressure, constipation	Forest, 2021
Epazote	*Dysphania ambrosioides (*L.) Mosyakin & Clemants	Amaranthaceae	0.02	50%	Appetite, worms	Hewis *et al.,* 2020
Bowl-shaped coleus	*Iresine herbstii* Hook.	Amaranthaceae	0.02	25%	Asthma, shortness of breath	Safrina, 2018
Shallot	*Allium cepa* L.	Amaryllisaceae	0.03	75%	Fever, diabetes, cough, shortness of breath	Lestari *et al.,* 2021
Garlic	*Allium sativum* L.	Amaryllisaceae	0.03	60%	High blood pressure, cholesterol, diabetes, heart disease and infertility	Lisiwanti & Haryanto, 2017
Soursop	*Annona muricata* L.	Annonaceae	0.03	33.30%	Tumor	Banerjee *et al* ., 2018
Celery	*Apium graveolens* L.	Apiaceae	0.03	50%	High blood pressure, cholesterol, diabetes, liver	Asmawati *et al.*, 2016
Carrot	*Daucus carota* L.	Apiaceae	0.03	50%	Eye medicine, cholesterol	Angraini, 2015
Wild fennel	*Foeniculum vulgare* Mill.	Apiaceae	0.03	50%	Heart, menstrual pain, increased breast milk, muscle pain	Sudarsono *et al.* , 2002
Periwinkle	*Catharanthus roseus* (L.) G.Don	Apocynaceae	0.04	33.30%	Diabetes, insect bites, sore throat	Satyarsa, 2019

Taro	*Colocasia esculenta* (L.) Schott	Araceae	0.03	50%	Diabetes, muscle pain	Ristanti *et al*., 2021
Suji	*Dracaena angustifolia* (Medik.) Roxb.	Asparagaceae	0.02	50%	Headache, cough	Kwon *et al*., 2007
Snake plant	*Sansevieria trifasciata* hort. ex Prain	Asparagaceae	0.02	10%	Hemorrhoids	Idhan, 2015
Aloe vera	*Artemisia vulgaris* Burm.f.	Asphodelaceae	0.03	100%	Hair Health	Judge, 2020
Chinese mugwort	*Bidens pilosa* L.	Asteraceae	0.03	40%	Vaginal discharge, blood sores, appetite, constipation, nausea	Soetjipto *et al*., 2014
[Perlu klarifikasi]	*Conyza sumatrensis* (Retz.) E.Walker	Asteraceae	0.03	50%	Burns, itching boils, constipation, diarrhea	The Prophet & The Prophet, 2021
Cosmos	*Colocasia esculenta* (L.) Schott	Asteraceae	0.03	25%	Headache, itchy boils, chicken pox, muscle pain	Lubis, 2017
King's salad	*Cosmos caudatus* Kunth	Asteraceae	0.03	50%	High blood pressure, diabetes	Angraini, 2015
Sintrong	*Crassocephalum crepidioides* (Benth.) S.Moore	Asteraceae	0.03	50%	Smallpox, body odor, stomach acid, diarrhea	Simanungkalit *et al*., 2020
Elephant's footprint	*Taraxacum japonicum* Koidz.	Asteraceae	0.03	33.30%	Gastric acid, constipation, liver	Zanatta *et al*., 2021
Garden balsam	*Impatiens balsamina* L.	Balsamaceae	0.03	33.30%	Itching, insect bites, appendicitis	Baskar *et al*, 2012
Begonia	*Begonia* × *tuberhybrida* Voss	Begoniaceae	0.01	10%	Itchy	Ngazizah *et al*., 2017
Lipstick tree	*Bixa orellana* L.	Bixaceae	0.04	33.30%	Fever, eye drops, constipation	Princess & Tavita, 2014
Spoon mustard	*Brassica chinensis* L.	Brassicaceae	0.25	33.30%	Dizziness, cough, muscle pain	Fortune, 2004
Broccoli	*Brassica oleracea* L.	Brassicaceae	0.25	10%	Cholesterol	Fatharanni & Anggraini, 2017).
Pineapple	*Ananas comosus* var. *albus* (L.B.Sm.)	Bromoliaceae	0.03	50%	Mouth ulcers, diarrhea	Nofita *et al*., 2018
Milkweed	*Hippobroma longiflora* (L.) G.Don	Campanulaceae	0.03	33.30%	Eye medicine, asthma, diarrhea	Permana *et al*., 2022
Papaya	*Carica papaya* L.	Caricaceae	0.04	33.30%	Fever, bleeding wounds, hemorrhoids	Mavianti & Rizky, 2019
Sweet potato	*Ipomoea* sect. *Batatas* (Choisy) Griseb.	Convolvulaceae	0.01	50%	High blood pressure	Anjani *et al*., 2018
Morning glory	*Ipomoea indica* (Burm.) Merr.	Convolvulaceae	0.01	10%	Eye medicine	Marine, 2012
Leaf of life	*Kalanchoe pinnata* (Lam.) Pers.	Crassulaceae	0.01	25%	Cholesterol, diabetes	Octaria, 2013

Grape cactus	*Sedum morganianum* E.Walther	Crassulaceae	0.01	10%	Diabetes	Erland *et al*., 2019
Pumpkin	*Cucurbita moschata* Duchesne ex Poir.	Cucurbitaceae	0.01	10%	Heart	Angraini, 2015
Tree fern	*Cyathea cooperi* (Hook. ex F.Muell.) Domin	Cyatheaceae	0.04	66.60%	Fever, rheumatism, constipation	Sya'haya & Iyos, 2016
Sago palm	*Cycas rumphii* var. *bifida* Dyer	Cycadaceae	0.03	50%	Muscle pain, stomach acid	Amen, 2021
Nutgrass	*Cyperus rotundus* Hook.f.	Cyperaceae	0.04	33.30%	Menstrual pain, burns, diarrhea	Lawal and Oyedaji, 2009
Acacia	*Acacia abbatiana* Pedley	Fabaceae	0.01	10%	Cough	Joseph *et al*., 2016
Peanut	*Arachis hypogaea* L.	Fabaceae	0.01	10%	Constipation	Puspamika, 2014
Leucaena	*Leucaena leucocephala* (Lam.) de Wit	Fabaceae	0.01	10%	Diabetes	Devotion, 2017
Stink bean	*Parkia speciosa* Hassk.	Fabaceae	0.01	10%	Anemia	Awaliyah *et al*., 2020
Ashoka	*Saraca asoca* (Roxb.) W.J.de Wilde	Fabaceae	0.01	10%	Menstrual pain	Daily, 2013
Easter lily	*Lilium longiflorum* Thunb.	Liliaceae	0.01	10%	Cough	Emran *et al*., 2012
Mulberry	*Morus alba* L.	Moraceae	0.01	10%	Constipation	Azhari, 2012
Moringa	*Moringa oleifera* Lam.	Moringaceae	0.01	33.30%	Cholesterol, diabetes, liver	Proverawati and Nuriya, 2021
Guava	*Psidium guajava* L.	Myrtaceae	0.03	50%	Diarrhea, fever	Kurnia *et al*., 2020
Red shoot	*Syzygium paniculatum* Gaertn.	Myrtaceae	0.03	50%	Diarrhea, diabetes	Rahmiyani *et al*., 2022
Bay leaf	*Syzygium polyanthum* Miq.	Myrtaceae	0.03	66.60%	High blood pressure, cholesterol, shortness of breath	Harismah, 2016
Jasmine	*Jasminum sambac* (L.) Aiton	Oleaceae	0.03	50%	Dizziness, shortness of breath	Novi & Rizki, 2015
Indian goosegrass	*Fuchsia magellanica* Lam.	Onagraceae	0.04	66.60%	Urination, diarrhea, nosebleeds	Yasmin *et al*., 2013
Starfruit	*Averrhoa carambola* L.	Oxalidaceae	0.01	10%	Diabetes	Rachma *et al*., 2022
Pine	*Pinus merkusii* Jungh. & de Vriese,	Pinaceae	0.04	33.30%	Dizziness, shortness of breath, nausea	Wiyono *et al*., 2006
Chinese betel	*Peperomia pellucida* (L.) Kunth	Piperaceae	0.35	66.60%	Gastric acid, urinary tract infections, tumors	Faizah *et al*., 2022
Black betel	*Piper betle* L.	Piperaceae	0.35	75%	Heart, vaginal discharge, cough, asthma	Sari, 2011

Yellow bamboo	*Bambusa vulgaris* Schrad.	Poaceae	0.26	50%	Liver and muscle pain	The Queen, 2015
Lemongrass	*Cymbopogon citratus* (hort. ex DC.) Stapf	Poaceae	0.26	50%	High blood pressure, fever, dizziness, cough, shortness of breath, flu and colds	Clara *et al*., 2022
Corn	*Zea mays* L.	Poaceae	0.26	10%	Constipation	Hatta *et al*., 2022
Red balloon plant	*Persicaria capitata* (D.Don) Gross	Polygonaceae	0.01	10%	Fever	Ayaz *et al*., 2020
Yellow dock	*Rumex × abortivus* Ruhmer	Polygonaceae	0.01	10%	Diarrhea	Pratiwi, 2016
Strawberry	*Fragaria vesca* L.	Rosaceae	0.16	33.30%	Dizziness, fever, cholesterol	Julyasih *et al*., 2010
Malang apple	*Malus sylvestris* (L.) Mill.	Rosaceae	0.16	50%	Constipation, mouth ulcers and fresh breath	Utami, 2010
Peach	*Prunus persica* (L.) Batsch	Rosaceae	0.16	10%	Heart	Hanif *et al*., 2020
Chinese rose	*Rosa chinensis* Jacq.	Rosaceae	0.16	10%	Bleeding wound	Rukmana, 1995
Noni fruit	*Morinda citrifolia* L.	Rubiaceae	0.03	50%	High blood pressure, cholesterol, diabetes, gout	Dawn, 2016
Kaffir lime	*Citrus hystrix* DC.	Rutaceae	0.04	66.60%	Heart, itchy boils, canker sores	Septiadi *et al*., 2013
Forest datura	*Brugmansia suaveolens* (Willd.) Bercht. & J.Presl	Solanaceae	0.24	33.30%	Blood wounds, colds, flu, asthma	Nathania *et al*., 2020
Rainbow chili	*Capsicum annuum* L.	Solanaceae	0.24	50%	Cough, shortness of breath, flu, runny nose, sore throat	Clarah *et al*., 2017
Ground cherry	*Physalis angulata* L.	Solanaceae	0.24	50%	Diabetes, canker sores and fresh mouth	Julianti *et al*., 2019
Tomato	*Solanum lycopersicum* L.	Solanaceae	0.24	50%	Eye medicine, fever	Susanti & Sari, 2021
Pepino melon	*Solanum muricatum* Bert. ex Dunal	Solanaceae	0.24	50%	Diabetes, liver	Asri & Kalsum, 2021
Natal cherry	*Solanum pseudocapsicum* L.	Solanaceae	0.24	50%	Muscle pain, fever	Utami, 2010
Potato	*Solanum tuberosum* L.	Solanaceae	0.24	50%	Hemorrhoids, high blood pressure	Alghifari & Azizah, 2021
Lantana	*Lantana camara* L.	Verbenaceae	0.23	50%	Fever, diarrhea	Ifora *et al*., 2020
Sandpaper vine	*Petrea volubilis* Gaertn.	Verbenaceae	0.23	10%	Diabetes	Sharma & Vijayvergia, 2015
Blue porterweed	*Stachytarpheta jamaicensis* Gardner	Verbenaceae	0.23	60%	Liver, cough, tonsils, shortness of breath, sore throat	Elisma *et al*., 2010

Euphorbiaceae family consists of flowering plants encompassing approximately 300 genera and around 7,500 species (Waheed *et al.,* 2020). Predominantly found in tropical regions, the highest concentration of species exists in the Indo-Malay and tropical American zones. Many species in this family have been traditionally used in various countries to treat ailments such as cancer, diabetes, diarrhea, heart disease, hepatitis, eye diseases, and scabies. In Sumberbrantas Village, four species from this family are utilized for medicinal purposes: *Acalypha hispida* (Chenille Plant), *Euphorbia pulcherrima* (Poinsettia), *Excoecaria cochinchinensis* (Chinese Croton), and *Manihot esculenta* (Cassava). Studies indicate that plants from the Euphorbiaceae family exhibit broad-spectrum antibacterial activity against both Gram-positive and Gram-negative bacteria, as evidenced by inhibition zones. Key bioactive compounds responsible for this antibacterial property include alkaloids, flavonoids, saponins, tannins, steroids, and terpenoids. Additionally, plants in this family contain hydroxylamine, hesperidin, kaempferol, quercetin, rutin, apigenin, and phyllanthin (Putri et al., 2021).

The Lamiaceae family has a family use value of 0.31 (Table 4.2) and is frequently used as fresh herbs and traditional medicines. The seeds of *Ocimum basilicum* (Basil) are known to be beneficial in treating eye infections, particularly redness and irritation associated with mucus discharge (Yassir & Asnah, 2019). Other notable species within this family include *Ajuga reptans* (Bugleweed), *Coleus scutellarioides* (Coleus), *Mesona chinensis* (Grass Jelly), *Orthosiphon aristatus* (Cat's Whiskers), and *Salvia mexicana* (Mexican Sage). The Lamiaceae family is highly valued for its aromatic essential oils, phenolics, tannins, saponins, and organic acids, which contribute to its medicinal properties (Tambaru et al., 2019).

While several families have high use values, others exhibit lower values. One such family is the Oxalidaceae family, represented by *Averrhoa carambola* (Starfruit), which is utilized in Sumberbrantas Village. Its leaves are used to treat stomachaches, rheumatism, mumps, and fever, while the fruit serves as a remedy for whooping cough, acne, hypertension, bleeding gums, ulcers, tooth decay, digestive disorders, and inflammation. Starfruit contains sugars, phenolic compounds, calcium ions, amino acids, citric acid, vitamins, and cyanidin-3-O-β-D-glucoside. Additionally, it contains flavonoids and triterpenoids with antibacterial properties, as well as organic acids that act as natural antibiotics effective against *Salmonella* sp., promoting a stable gut microbiome. The highest organic acid concentration found in starfruit is citric acid (92.6–133.8 mg/100 g) (Aseptianova & Yuliany, 2020).

2. Fidelity Level (FL)

The Fidelity Level (FL) is a measure of a plant species' significance in treating specific ailments. FL represents the percentage of respondents who affirm the use of a species for a particular primary purpose, thus quantifying its medicinal importance (Khan et al., 2014). The FL values for each species are presented in **Table 1**. The study reveals that *Allium cepa* (Shallot) has the highest FL at 75%. In Sumberbrantas Village, it is commonly used to treat fever, shortness of breath, diarrhea, and hypertension. In Pekuncen, Banyumas, the outer skin of shallots is traditionally used to dye eggs, producing a reddish-brown hue. Shallot skins contain natural pigments such as anthocyanins and flavonoids, making them useful as natural dyes (Apriliani et al., 2014).

Similarly, *Mesona chinensis* (Grass Jelly) also holds an FL of 75%, widely used to treat rheumatism, muscle aches, and related ailments. Its leaves, rich in antioxidants, are believed to lower blood sugar levels in diabetic patients. Research has shown that its antioxidant activity, measured by inhibition concentration (IC50), is 46.92 ppm. The bioactive phenolic compounds in grass jelly include flavonoids, alkaloids, tannins, and various phenolic derivatives, all of which contribute to its strong antioxidant properties (Hung et al., 2002).

Curcuma longa (Turmeric) also has an FL of 75%, primarily used for ailments such as gastric acid disorders, muscle pain, dizziness, and nausea. Traditionally, turmeric has been widely used in Indonesia for both culinary and medicinal purposes. In vivo and in vitro studies indicate that curcumin exhibits anti-inflammatory, antiviral, antibacterial, antifungal, anticancer, antioxidant, and anti-diabetic properties, among others (Shanmugam et al., 2015). Clinical studies have further explored its potential in treating pancreatic, colon, and breast cancers, as well as multiple myeloma (Mutiah, 2015). Some species exhibit lower FL values, such as *Sansevieria trifasciata* (Snake Plant), *Musa acuminata* (Banana), *Arachis hypogaea* (Peanut), *Morus* sp. (Mulberry), *Zea mays* (Corn), *Rumex pulcher* (Yellow Dock), and *Brassica oleracea* (Broccoli), all at 0.01%. This low percentage suggests a need for further research on their medicinal applications. The novelty of this study lies in its application of a quantitative ethnobotanical index (FUV and FL) within a localized Indonesian context—Sumberbrantas Village—where such analyses have rarely been conducted. By integrating community-level ethnopharmacological data with statistical quantification, this study offers a replicable framework for identifying culturally significant plant families and prioritizing species for conservation and herbal development. The findings thus serve as a valuable reference for biodiversity conservation, sustainable utilization of medicinal flora, and the integration of traditional plant-based knowledge into modern healthcare and community empowerment strategies.

CONCLUSION

Based on the calculation of the Family Use Value (FUV), the study identifies plant families that hold medicinal significance for the community of Sumberbrantas Village. The findings indicate that the Zingiberaceae and Euphorbiaceae families have the highest FUV, both recorded at 0.45, whereas the Oxalidaceae family exhibits the lowest FUV, at 0.01.

The Fidelity Level (FL), which measures the importance of specific plant species used for treating particular ailments within the Sumberbrantas community, reveals that *Allium cepa* (red onion) has the highest FL at 75%, indicating its predominant use in traditional medicine. Conversely, certain species exhibit a significantly lower FL of just 0.01%, including Sansevieria trifasciata (snake plant), *Musa acuminata* (milk banana), *Arachis hypogaea (*peanut), *Morus* sp. (mulberry), *Zea mays* (corn), *Rumex pulcher* (yellow dock), and *Brassica oleracea* (broccoli).

AUTHORS CONTRIBUTION

Muhammad Ainur Rosyid Ridho was responsible for the conceptualization, methodology design, data collection and analysis, as well as drafting the initial manuscript. Indah Trisnawati provided supervision throughout the research process, validation of the results, and contributed to the review and editing of the manuscript. Tutik Nurhidayati was involved in field investigation and data visualization. Kristanti Indah Purwani supported the data collection process and provision of research resources. Dian Saptarini contributed to the literature review, reference management, and funding acquisition. Nengah Dwianita Kuswytasari carried out statistical analysis, interpretation of results, and final editing of the manuscript. All authors have read and approved the final version of the manuscript for publication.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this manuscript.

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