ASIAN JOURNAL OF ETHNOBIOLOGY
Volume 8, Number 1, May 2025 E-ISSN: 2580-4510
Pages: 79-91 DOI: 10.13057/asianjethnobiol/y080107

Ethnobotanical documentation of home gardens in relation to Javanese basic life needs in Kediri District, East Java, Indonesia

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Manuscript received: 12 February 2025. Revision accepted: 15 May 2025.

Abstract. *Afrianto WF. 2025. Ethnobotanical documentation of home gardens in relation to Javanese basic life needs in Kediri District, East Java, Indonesia. Asian J Ethnobiol 8: 79-91.* Home gardens, as traditional agroforestry approaches, not only promote plant diversity but also support human livelihoods. The Javanese community exhibits distinct cultural practices in the utilization of plant species in home gardens. This study examines the plant species utilized by the Javanese based on five dimensions of basic life needs. Data were collected from 55 home gardens through purposive sampling and analyzed based on Javanese philosophy: nourishment (*pangan*), clothing (*sandang*), shelter (*papan*), herbal medicine (*loro*), and traditional death-related rituals (*pati*). Information on all plants and their uses was directly obtained from respondents. The ethnobotany R package assessed the ethnobotanical importance of these plants. A total of 71 plant species from 43 families were identified, with trees being the most common life form and fruit-bearing plants dominating the community. The plants were mainly used as food (53 species), followed by medicine (17 species), construction (9 species), ritual (6 species), and clothing (1 species). Notably, *Moringa oleifera* Lam. and *Bambusa* sp. were found to serve three use categories. Ethnobotanical indices showed that *Mangifera indica* L. had the highest values. The study highlights that plant conservation in Javanese home gardens can be effectively achieved through cultural approaches. The role of sustainable home gardens in managing household and community food security and nutritional needs is significant and promising.

Keywords: Community, home garden, Javanese culture, quantitative ethnobiology, sustainable

INTRODUCTION

Home gardens, or *pekarangan* in Indonesian, are multifunctional spaces surrounding homes traditionally used to cultivate various plant species, including food crops, medicinal herbs, spices, and ornamental plants (Hakim et al. 2018). They are often categorized as traditional agroforestry systems due to their complex structure, high biodiversity, and sustainable land management practices (Park et al. 2019). Compared to other agricultural systems, home gardens offer a unique blend of ecological, economic, and social functions, with plant composition and diversity influenced by factors such as landholding size, cultural preferences, and household needs (Panyadee et al. 2018; Suwardi et al. 2023). Studies have demonstrated that more extensive home gardens exhibit higher Net Present Value (NPV), making them economically advantageous (Park et al. 2019).

Home gardens play an integral role in community life, contributing to food security by providing fresh, natural, and highly nutritious food sources (Lal 2020; Castañeda-Navarrete et al. 2021). Traditionally, home gardening employs environmentally friendly methods, avoiding synthetic pesticides and chemical fertilizers. Ecologically, these gardens enhance soil health by facilitating rainwater infiltration and nutrient cycling while also creating distinct microclimates and serving as habitats for various species (Mohri et al. 2013; Ibarra et al. 2021; Padmakumar et al. 2021). Economically, they reduce household expenses by supplying homegrown food, thereby decreasing reliance on store-bought produce. In addition to self-consumption, surplus crops can be sold or exchanged, providing families with an extra source of income and enhancing economic resilience (Linger 2014; Prihatini et al. 2018). Socially, home gardens serve as gathering spaces where family members and neighbors interact, strengthening community bonds (Iskandar et al. 2018). Given these various benefits, home gardens are integral to promoting food security, economic stability, and environmental sustainability.

Several studies have explored plant diversity in East Java, including regions such as Banyuwangi, Malang, Madura, Bondowoso, and Pasuruan (Oktavianti and Hakim 2013; Maningtyas and Gunawan 2017; Hakim et al. 2018; Faruq et al. 2021; Hariyati et al. 2022; Setiani et al. 2022; Agustina et al. 2024). In Javanese society, five fundamental human needs—*sandang*, *pangan*, *papan*, *loro*, and *pati*—are essential for survival and well-being. *Sandang* (clothing) refers to the necessity of garments that provide protection, comfort, and a means of expressing social identity. *Pangan* (food) represents the fundamental requirement for nourishment, supplying the energy and nutrients essential for health and growth. *Papan* (shelter) signifies the need for a safe and comfortable living space that offers protection from environmental elements and serves as a place for rest and family gatherings. *Loro* (health) encompasses overall well-being, including access to healthcare and the adoption of a healthy lifestyle to prevent diseases. Finally, *pati* (death) relates to cultural and spiritual aspects, ensuring proper preparation and respect for individuals after their passing. These five needs are intricately connected to the traditional Javanese calendar system, *weton*, which is used to determine auspicious days for significant life events such as weddings, house moves, and business ventures (Hidayati et al. 2023; Ma'ruf and Kusumawati 2023; Putri et al. 2024). In other Indonesian cultures, basic human needs are also categorized into five key aspects. For instance, in the Tidung Tribe of North Kalimantan, plants are recognized for their usefulness in providing food (*ngakan*), shelter (*baloy*), health and medicine (*sihat*), traditional ceremonies (*adat*), and clothing (*memana*) (Suciyati et al. 2021). Meanwhile, Suwardi et al. (2023) sought to align the roles of plants in home gardens with the Sustainable Development Goals (SDGs), which broadly reflect similar dimensions of human well-being and sustainable resource use.

Despite these benefits, several challenges persist, including declining land availability, lifestyle and dietary preferences shifts, and reduced transmission of traditional ecological knowledge to younger generations (Afrianto et al. 2021). In particular, the erosion of local knowledge systems has led to the underutilization of home gardens' multifunctionality and the loss of plant diversity in some regions. This study addresses that gap by analyzing plant diversity and traditional plant utilization in Kediri, East Java, home gardens. By concentrating on how plant species accomplish the five essential needs of Javanese families and how traditional beliefs and cultural calendars shape these traditions, this research contributes to a more comprehensive understanding of home gardens as dynamic socioecological systems. The study aims to inform sustainable development and biodiversity conservation strategies that respect and leverage local knowledge systems (Afrianto et al. 2021, 2023; Afrianto and Metananda 2023).

MATERIALS AND METHODS

Study area

The study was conducted in February 2024 in Datengan Village, Grogol Sub-district, Kediri District, East Java Province, Indonesia (Figure 1). The area is located at a latitude of -7.7458° (7°44'45" south) and longitude of 111.9928° (111°59'34" east); the village lies at an elevation of 62 meters (203 feet) above sea level. The area features sloping and lowland topography. Agriculture is the primary livelihood of the local population, with most residents engaged in farming. Rice is the leading agricultural commodity, and many villagers supplement their income by raising livestock, including chickens, goats, and cows.

Procedures

Data were collected from 55 home gardens and served as study samples. Purposive sampling was employed to define and select samples based on specific criteria (Muhlisin et al. 2021). Informants were collected from home garden owners, most of whom were between 40 and 60 years old and primarily worked as farmers. The majority of the gardeners were women, with an average of two to three people involved in maintaining each garden. Their education levels ranged from elementary school to junior high school, and their economic status varied from low to middle income. Based on Suwardi et al. (2023), the surveyed home gardens were divided into three categories: (i) small (<500 m^2); (ii) medium (501-1500 m^2); and (iii) large (>1500 m^2). The Javanese philosophy of *sandang, pangan, papan, loro,* and *pati* represents a holistic framework for human life needs that is deeply embedded in traditional home garden management. This concept offers a culturally grounded approach to understanding plant diversity and utilization patterns in Kediri's home gardens.

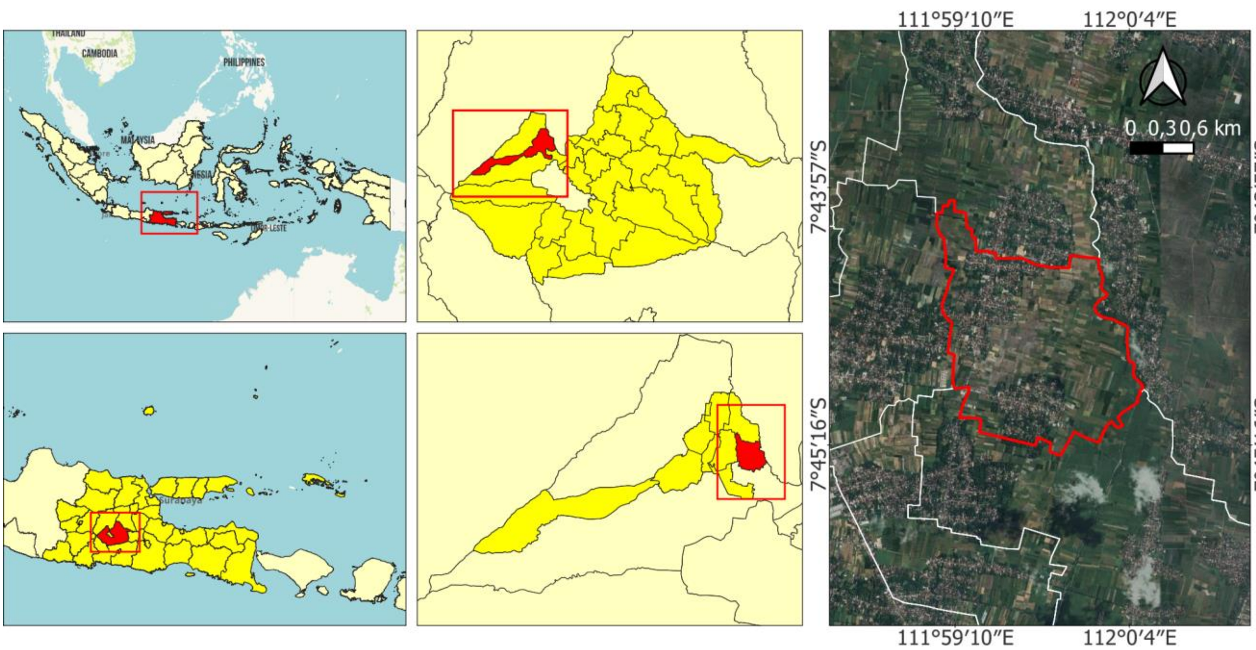

Figure 1. Map of study location in Datengan Village, Grogol Sub-district, Kediri District, East Java, Indonesia

Home gardens play a vital role in daily life. In *pangan* or food, they serve as "living supermarkets", providing a rich source of nutritious ingredients while also preserving local crop varieties. In terms of shelter or *papan*, these gardens offer essential materials for construction and housing. The health aspect, or *loro*, is reflected in the use of medicinal plants for traditional healing and disease prevention, highlighting the deep connection between herbal knowledge and Javanese wellness practices. Lastly, the concept of *pati*, or death, illustrates how plants are intertwined with human life cycles—used in funeral rituals and offerings to honor ancestors, reinforcing their cultural and spiritual significance. Direct sampling was carried out to compile a checklist of plants, and Plants of the World Online (https://powo.science.kew.org/) was utilized to verify the scientific names of the species.

Data analysis

All ethnobotanical indices are based on a fundamental data structure: "an informant i reports the use of species within use-category u." Use Report (UR) defines the combination of the three variables, informant, species, and use category (Kufer et al. 2005). In a given survey involving NS species (s_1, s_2, ..., s_n), NC use-categories (u_1, u_2,...,u_n), and N informants (i_1,i_2,..., i_n), a UR value is assigned as 1 when a particular combination is reported and 0 if it is not. These ethnobotanical records can be organized by holding one or two variables constant. The cultural importance of plants calculated the total number of UR per species:

$$\mathrm{UR}_s = \sum_{u=u_1}^{u_{NC}} \sum_{i=i_1}^{i_N} \mathrm{UR}_{ui}.$$

The process begins by totaling the use reports provided by all informants (from i_1 to i_n) for each use category associated with a given species, representing the number of informants who identified that specific use. Next, the use reports are aggregated across all use categories (from u_1 to u_{Nc}) to determine the overall frequency of use for that species.

The Relative Frequency of Citation (RFC) measures how commonly a species is mentioned by informants, regardless of how it is used. It is calculated by dividing the number of people who mention the species (frequency of citation or FC) by the total number of informants in the study (N). In this case, all mentions of the species are counted without separating them by specific use categories.

$$\mathrm{RFC}_s = \frac{\mathrm{FC}_s}{N} = \frac{\sum_{i=i_1}^{i_N} \mathrm{UR}_i}{N}$$

The Relative Importance Index (RI) measures how important a plant species is by considering the different types of uses it has (Pardo-de-Santayana 2003). Notably, this index only includes broad categories of use and does not take more specific subcategories into account. The calculation follows a particular formula based on these general use types.

$$\mathrm{RI}_s = \frac{\mathrm{RFC}_{s(max)} + \mathrm{RNU}_{s(max)}}{2}$$

$\mathrm{RFC}_{s(max)}$ refers to the relative frequency of citation of a species compared to the most frequently cited species in the entire study. It is calculated by dividing the frequency of citation (FC_s) for a particular species by the highest FC value among all species in the survey, $\mathrm{RFC}_{s(max)} = \mathrm{FC}_s$ / Max (FC). $\mathrm{RNU}_{s(max)}$ stands for the relative number of use categories in comparison to the highest observed in the survey. It is determined by dividing the number of use categories recorded for a particular species by the maximum number in all species in the study [$\mathrm{RNU}_{s(max)} = \mathrm{NU}_s$ / Max (NU)].

$$NU_s = \sum_{u=u_1}^{u=u_{NC}} UR_u$$

The Cultural Value Index for ethnospecies (CVe) is calculated by multiplying three distinct components that reflect a species' cultural significance (Reyes-García et al. 2006). The first component is the ratio between the number of different uses reported for a species and the total number of use categories considered in the study, obtained by dividing the Number of Uses (NUs) by the total categories (NC). The second component is the Relative Frequency of Citation (RFC), which indicates how frequently informants mention the species. The third component is the proportion of Use Reports (UR), calculated by dividing the total number of individual reports for all uses of the species by the total number of participants (N). By multiplying these three factors, the CVe index captures not only the diversity of uses but also the frequency and cultural relevance of a species within the community.

$$\mathrm{CVe} = \left[\mathrm{NU}_s/\mathrm{NC}\right] \times \left[\mathrm{FC}_s/\mathrm{N}\right] \times \left[\sum_{u=u_1}^{u_{NC}} \sum_{i=i_1}^{i_N} \mathrm{UR}_{ui}/\mathrm{N}\right]$$

The Cultural Importance Index (CIs) measures the total proportion of informants who reported using each species.

$$\mathrm{CI}_s = \sum_{u=u_1}^{u_{NC}} \sum_{i=i_1}^{i_N} \mathrm{UR}_{ui}/\mathrm{N}$$

It is important to highlight that the total value of CI is numerically identical to that of the Use Value (UVs) index when calculated using a simplified formula, even though the two indices are conceptually distinct. UV starts with the sum of URs groupings by informants:

$$\mathrm{UV}_s = \sum_{i=i_1}^{i_N} \sum_{u=u_1}^{u_{NC}} \mathrm{UR}_{iu}/N$$

The Fidelity Level (FLs) for each species in the study by calculating the proportion of informants who report using a particular plant for a specific purpose relative to its total reported uses across all purposes. It reflects how consistently a plant is used for the same function among informants. According to Friedman et al. (1986), FCs refers to the number of informants who use a particular plant for a specific purpose, while Ns represents the total number of informants who mentioned using that plant for any purpose. Ethnobotanical indices were calculated using RStudio with the ethnobotanyR package (Whitney 2021).

$$FL_s = \frac{N_s * 100}{FC_s}$$

Indices alone might not capture the full picture of human-nature relationships, but they offer a useful entry point for examining key dynamics. By quantifying otherwise intangible aspects of how societies interact with their surroundings, these indices contribute meaningful data. While they shouldn't stand alone, they can support more in-depth and integrated evaluations. A non-parametric Bayesian bootstrap was performed utilizing the ethno-boot function. It substituted a sample of size 'n1' describing the posterior distribution of the selected statistics (e.g., 'mean'). The procedure employed the Dirichlet distribution to represent the randomness of a Probability Mass Function (PMF) across all possible outcomes for limited groups. It was conjugated before the unconditional and multinomial distributions. A Probability Mass Function (PMF), or frequency function, describes the probabilities of discrete outcomes, such as binary responses (0 = no use, 1 = use) or finite counts (e.g., plant uses reported by up to n interviewees). The Dirichlet distribution models n positive random variables (X_1 , ..., X_n) that collectively sum to 1, analogous to the multinomial distribution but as a continuous generalization. Here, we apply this framework to analyze differences in use (binary: 0/1) between two species (a and b). To compare species or informants visually, plot the posterior distribution generated by ethno-boot after reshaping the data into a ggplot2-friendly format (e.g., via melt) (Whitney 2021).

This study employed Venn diagrams to analyze and display overlaps in plant species usage across different groups or categories. Plant diversity similarities among differently-sized home gardens were analyzed and visualized through dendrogram clustering. Principal Component Analysis (PCA) was used to explore how plant diversity is related to five essential life needs. Since all variables showed non-normal distributions, we analyzed relationships between indices using Spearman's rank correlation coefficient.

RESULTS AND DISCUSSION

This study identified a total of 71 plant species in the home gardens across the study sites (Table 1), categorized according to their uses in nourishment (*pangan*), clothing (*sandang*), shelter (*papan*), herbal medicine (*loro*), and traditional death-related rituals (*pati*) (Table 1). These species belonged to 43 families (Figure 2), with Fabaceae being the most dominant (7%), followed by Zingiberaceae (6%), Annonaceae, Malvaceae, Moraceae, Myrtaceae, Poaceae, Rutaceae, and Solanaceae (5% each). Based on life forms, trees were the most prevalent (34 species), followed by herbs (21 species), shrubs (9 species), vines (6 species), and bamboo (1 species) (Figure 3.A). Fruits (30 species) were the most commonly used plant parts, followed by leaves (28 species), flowers (8 species), trunks (5 species), rhizomes (4 species), tubers (3 species), stem (3 species), and seeds (1 species) (Figure 3.B). Several species, including *Bambusa* sp., *Carica papaya* L., *Ceiba pentandra* (L.) Gaertn., *Citrus hystrix* DC., *Cocos nucifera* L., *Colocasia esculenta* (L.) Schott, *Ipomoea batatas* (L.) Lam., *Manihot esculenta* Crantz, *Morinda citrifolia* L., and *Musa ×paradisiaca* L., had multiple parts utilized for various purposes.

A total of 55 home gardens were surveyed and categorized into three size classifications: 13 large home gardens (<500 m^2), 11 medium home gardens (501-1,500 m^2), and 31 small home gardens (>1,500 m^2). The dendrogram analysis showed that medium and small home gardens exhibited greater similarity compared to large ones. Several plant species were common across all three categories, including *Amaranthus hybridus* L., *Annona squamosa* L., *Artocarpus heterophyllus* Lam., *Averrhoa carambola* L., *Capsicum annuum* L., *C. papaya*, *C. pentandra*, *Dimocarpus longan* Lour., *I. batatas*, *Jasminum sambac* (L.) Aiton, *Leucaena leucocephala* (Lam.) de Wit, *Mangifera indica* L., *M. esculenta*, *Manilkara zapota* (L.) P.Royen, *Moringa oleifera* Lam., *M. paradisiaca*, *Ocimum basilicum* L., *Plumeria* sp., *Psidium guajava* L., and *Zingiber officinale* Roscoe (Figure 4.A). The dendrogram results further indicated that medium and small home gardens tended to be more uniform in composition compared to large ones (Figure 4.B). The Venn diagram shows the absolute number of overlapping species, while the dendrogram clusters are based on relative similarity, which may explain differences in group relationships between the two.

Based on the use categories, plant species in the home gardens were primarily used for food (53 species), followed by medicine (17 species), construction (8 species), ritual (6 species), and clothing (1 species). Across all home gardens, a total of 281 Use Reports (UR) were recorded, with the majority attributed to food (UR=212), medicine (UR=24), ritual (UR=22), construction (UR=22), and clothing (UR=1) (Figure 5.A). Among the species, *Bambusa* sp. and *M. oleifera* had the highest number of uses (NU=3). The biplot analysis revealed 9 clusters of use categories based on species presence or absence, with principal components PC1 and PC2 accounting for 53.6% of the variation in the use categories (Figure 5.B).

Two species, *M. oleifera* and *Bambusa* sp. (Figure 6.A), were found to have the highest number of uses (three). A non-parametric Bayesian bootstrap analysis was conducted to calculate credible intervals for these uses. For *M. oleifera*, the credible interval for food use ranged from 1.00 (lower bound) to 1.00 (upper bound). For ritual use, the interval was 0.10 (lower bound) to 0.76 (upper bound), and for medicine, it ranged from 0.46 (lower bound) to 0.99 (upper bound). For *Bambusa* sp., the credible interval for food use was 0.05 (lower bound) to 0.95 (upper bound), while for construction use, it ranged from 1.00 (lower bound) to 1.00 (upper bound). Additionally, the interval for *Bambusa* sp. Used in construction was 0.53 (lower bound) to 0.95 (upper bound) (Figure 6.B).

Table 1. Plant species diversity in the home gardens

Code	Scientific name	Family	Form	Part	NU	UR	UV	FC	RFC	CI	RI	CVe	Use categories
A. alt	*Artocarpus altilis* (Parkinson) Fosberg	Moraceae	T	Fr	2	2	0.036	1	0.018	0.036	0.356	0	Fo, Co
A. bil	*Averrhoa bilimbi L.*	Oxalidaceae	T	L	1	1	0.018	1	0.018	0.018	0.189	0	Fo
A. car	*Averrhoa carambola* L.	Oxalidaceae	T	L	1	4	0.071	4	0.071	0.071	0.258	0.001	Fo
A. cor	*Anredera cordifolia* (Ten.) Steenis	Basellaceae	V	L	1	1	0.018	1	0.018	0.018	0.189	0	Me
A. het	*Artocarpus heterophyllus* Lam.	Moraceae	T	Fr	1	11	0.196	11	0.196	0.196	0.417	0.008	Fo
A. hyb	*Amaranthus hybridus* L.	Amaranthaceae	H	L	1	10	0.179	10	0.179	0.179	0.394	0.006	Fo
A. mur	*Annona muricata* L.	Annonaceae	T	L	1	2	0.036	2	0.036	0.036	0.212	0	Fo
A. pae	*Amorphophallus paeoniifolius* (Dennst.) Nicolson	Araceae	H	Tu	1	1	0.018	1	0.018	0.018	0.189	0	Fo
A. squ	*Annona squamosa* L.	Annonaceae	T	Fr	1	5	0.089	5	0.089	0.089	0.28	0.002	Fo
A. ver	*Aloe vera* (L.) Burm.f.	Asphodelaceae	H	L	1	2	0.036	2	0.036	0.036	0.212	0	Me
B. jun	*Brassica juncea* (L.) Czern.	Brassicaceae	H	L	1	1	0.018	1	0.018	0.018	0.189	0	Fo
B. sp	*Bambusa* sp.	Poaceae	B	Tr, St	3	4	0.071	2	0.036	0.071	0.545	0.002	Fo, Cl, Co
C. ann	*Capsicum annuum* L.	Solanaceae	H	Fr	1	7	0.125	7	0.125	0.125	0.326	0.003	Fo
C. asi	*Centella asiatica* (L.) Urb.	Apiaceae	H	L	1	1	0.018	1	0.018	0.018	0.189	0	Fo
C. cau	*Cosmos caudatus* Kunth	Asteraceae	H	L	1	1	0.018	1	0.018	0.018	0.189	0	Fo
C. esc	*Colocasia esculenta* (L.) Schott	Araceae	H	L, St	1	3	0.054	3	0.054	0.054	0.235	0.001	Fo
C. hys	*Citrus hystrix* DC.	Rutaceae	T	Fr, L	1	4	0.071	3	0.054	0.054	0.402	0.002	Fo, Me
C. jap	*Citrus japonica Thunb.*	Rutaceae	T	Fr	1	1	0.018	1	0.018	0.018	0.189	0	Fo
C. max	*Citrus maxima* (Burm.) Merr.	Rutaceae	T	Fr	1	1	0.018	1	0.018	0.018	0.189	0	Fo
C. nar	*Cymbopogon nardus* L. Rendle	Poaceae	H	St	2	6	0.107	5	0.089	0.107	0.447	0.004	Fo, Me
C. nuc	*Cocos nucifera* L.	Arecaceae	T	Tr, L, Fr	2	4	0.071	3	0.054	0.071	0.402	0.002	Fo, Co
C. odo	*Cananga odorata* (Lam.) Hook.f. & Thomson	Annonaceae	S	Fl	1	4	0.071	4	0.071	0.071	0.258	0.001	Ri
C. pap	*Carica papaya* L.	Caricaceae	T	Fr, Lv	1	11	0.196	11	0.196	0.196	0.417	0.008	Fo
C. pen	*Ceiba pentandra* (L.) Gaertn.	Malvaceae	T	L. Fr	1	6	0.107	6	0.107	0.107	0.303	0.002	Co
C. ter	*Clitoria ternatea* L.	Fabaceae	V	Fl	2	2	0.036	2	0.036	0.036	0.379	0.001	Fo, Me
C. xan	*Curcuma xanthorrhiza* D. Dietr	Zingiberaceae	H	Rh	1	1	0.018	1	0.018	0.018	0.189	0	Me
D. lon	*Dimocarpus longan* Lour.	Sapindaceae	T	Fr	1	5	0.089	5	0.089	0.089	0.28	0.002	Fo
D. zib	*Durio zibethinus* L.	Malvaceae	T	Fr	1	1	0.018	1	0.018	0.018	0.189	0	Fo
F. fal	*Falcataria falcata* (L.) Greuter & R.Rankin	Fabaceae	T	Tr	1	1	0.018	1	0.018	0.018	0.189	0	Co
G. man	*Garcinia mangostana* L.	Clusiaceae	T	Fr	1	1	0.018	1	0.018	0.018	0.189	0	Fo
H. til	*Hibiscus tiliaceus* L.	Malvaceae	T	Tr	1	1	0.018	1	0.018	0.018	0.189	0	Co
I. aqu	*Ipomoea aquatica* Forssk.	Convolvulaceae	H	L	1	1	0.018	1	0.018	0.018	0.189	0	Fo
I. bal	*Impatiens balsamina* L.	Balsaminaceae	H	Fl	1	3	0.054	3	0.054	0.054	0.235	0.001	Ri
I. bat	*Ipomoea batatas* (L.) Lam.	Convolvulaceae	H	L, Tu	1	4	0.071	4	0.071	0.071	0.258	0.001	Fo
J. mul	*Jatropha multifida* L.	Euphorbiaceae	S	L	1	1	0.018	1	0.018	0.018	0.189	0	Me
J. sam	*Jasminum sambac* (L.) Aiton	Oleaceae	S	Fl	1	5	0.089	5	0.089	0.089	0.28	0.002	Ri
K. gal	*Kaempferia galanga* L.	Zingiberaceae	H	Rh	1	1	0.018	1	0.018	0.018	0.189	0	Me
L. acu	*Luffa acutangula* (L.) Roxb.	Cucurbitaceae	V	Fr	1	1	0.018	1	0.018	0.018	0.189	0	Fo
L. leu	*Leucaena leucocephala* (Lam.) de Wit	Fabaceae	T	Se	2	16	0.286	13	0.232	0.286	0.629	0.027	Fo, Co
M. alb	*Morus alba* L.	Moraceae	T	Fr	1	1	0.018	1	0.018	0.018	0.189	0	Fo
M. cal	*Muntingia calabura* L.	Muntingiaceae	T	Fr	1	1	0.018	1	0.018	0.018	0.189	0	Fo
M. cit	*Morinda citrifolia* L.	Rubiaceae	T	L, Fr	1	1	0.018	1	0.018	0.018	0.189	0	Me

M. esc	*Manihot esculenta* Crantz	Euphorbiaceae	S	L, Tu	1	10	0.179	10	0.179	0.179	0.394	0.006	Fo
M. ind	*Mangifera indica* L.	Anacardiaceae	T	Fr	1	23	0.411	22	0.393	0.411	0.883	0.065	Fo
M. ole	*Moringa oleifera* Lam.	Moringaceae	T	L	3	11	0.196	5	0.089	0.196	0.614	0.011	Fo, Me, Ri
M. par	*Musa ×paradisiaca* L.	Musaceae	H	Fr, Fl, L	1	18	0.321	18	0.321	0.321	0.576	0.021	Fo
M. zap	*Manilkara zapota* (L.) P.Royen	Sapotaceae	T	Fr	1	8	0.143	8	0.143	0.143	0.348	0.004	Fo
N. lap	*Nephelium lappaceum* L.	Sapindaceae	T	Fr	1	4	0.071	4	0.071	0.071	0.258	0.001	Fo
O. bas	*Ocimum basilicum* L.	Lamiaceae	H	L	1	4	0.071	4	0.071	0.071	0.258	0.001	Fo
P. ama	*Pandanus amaryllifolius* Roxb. ex Lindl.	Pandanaceae	H	L	1	2	0.036	2	0.036	0.036	0.212	0	Fo
P. ame	*Persea americana* Mill.	Lauraceae	T	Fr	1	2	0.036	2	0.036	0.036	0.212	0	Fo
P. ang	*Physalis angulata* L.	Solanaceae	S	Fr	1	1	0.018	1	0.018	0.018	0.189	0	Fo
P. bet	*Piper betle* L.	Piperaceae	V	L	1	1	0.018	1	0.018	0.018	0.189	0	Me
P. gra	*Punica granatum* L.	Lythraceae	S	Fr	1	2	0.036	2	0.036	0.036	0.212	0	Fo
P. gua	*Psidium guajava* L.	Myrtaceae	T	Fr	1	15	0.268	15	0.268	0.268	0.508	0.014	Fo
P. ind	*Pluchea indica* (L.) Less.	Asteraceae	S	L	2	2	0.036	1	0.018	0.036	0.356	0	Fo, Me
P. sp.	*Plumeria* sp.	Apocynaceae	T	Fl	1	6	0.107	6	0.107	0.107	0.303	0.002	Ri
R. hyb	*Rosa x hybrida* Schleich. Ex W.D.J.Koch & Ziz	Rosaceae	S	Fl	2	3	0.054	3	0.054	0.054	0.402	0.001	Me, Ri
S. aqu	*Syzygium aqueum* (Burm.F.) Alston	Myrtaceae	T	Fr	1	2	0.036	2	0.036	0.036	0.212	0	Fo
S. gra	*Sesbania grandiflora* (L.) Poir.	Fabaceae	T	Fl	1	1	0.018	1	0.018	0.018	0.189	0	Fo
S. mel	*Solanum melongena* L.	Solanaceae	H	Fr	1	1	0.018	1	0.018	0.018	0.189	0	Fo
S. mon	*Selenicereus monacanthus* (Lem.) D.R.Hunt	Cactaceae	V	Fr	1	4	0.071	4	0.071	0.071	0.258	0.001	Fo
S. off	*Saccharum officinarum* L.	Poaceae	H	St	1	1	0.018	1	0.018	0.018	0.189	0	Fo
S. poly	*Syzygium polyanthum* (Wight) Walp.	Myrtaceae	S	L	1	1	0.018	1	0.018	0.018	0.189	0	Fo
T. cat	*Terminalia catappa* L.	Combretaceae	T	L	2	1	0.018	1	0.018	0.018	0.189	0	Me
T. gra	*Tectona grandis* Linn. f.	Lamiaceae	T	Tr	1	6	0.107	6	0.107	0.107	0.303	0.002	Co
T. ind	*Tamarindus indica* L.	Fabaceae	T	Fr	2	2	0.036	1	0.018	0.036	0.356	0	Fo, Me
V. vin	*Vitis vinifera* L.	Vitaceae	V	Fr	1	2	0.036	2	0.036	0.036	0.212	0	Fo
Z. mau	*Ziziphus mauritiana* Lam.	Rhamnaceae	T	Fr	1	1	0.018	1	0.018	0.018	0.189	0	Fo
Z. off	*Zingiber officinale* Roscoe	Zingiberaceae	H	Rh	2	6	0.107	5	0.089	0.107	0.447	0.004	Fo, Me
Z. zer	*Zingiber zerumbet* (L.) Roscoe ex Sm.	Zingiberaceae	H	Rh	1	1	0.018	1	0.018	0.018	0.189	0	Me

Note: T: Trees, H: Herbs, V: Vines, B: Bamboos, Fr: Fruits, L: Leaves, Rh: Rhizomes, Fl: Flowers, Tu: Tubers, Tr: Trunk, Fo: Food, Me: Medicine, Cl: Clothing, Co: Construction, Ri: Ritual, CI: Cultural Importance, RFC: Relative Frequency of Citation, RI: Relative Importance, CV: Cultural Value, FC: Frequency of Citation, UR: Number of Use-Reports, NU: Number of Uses

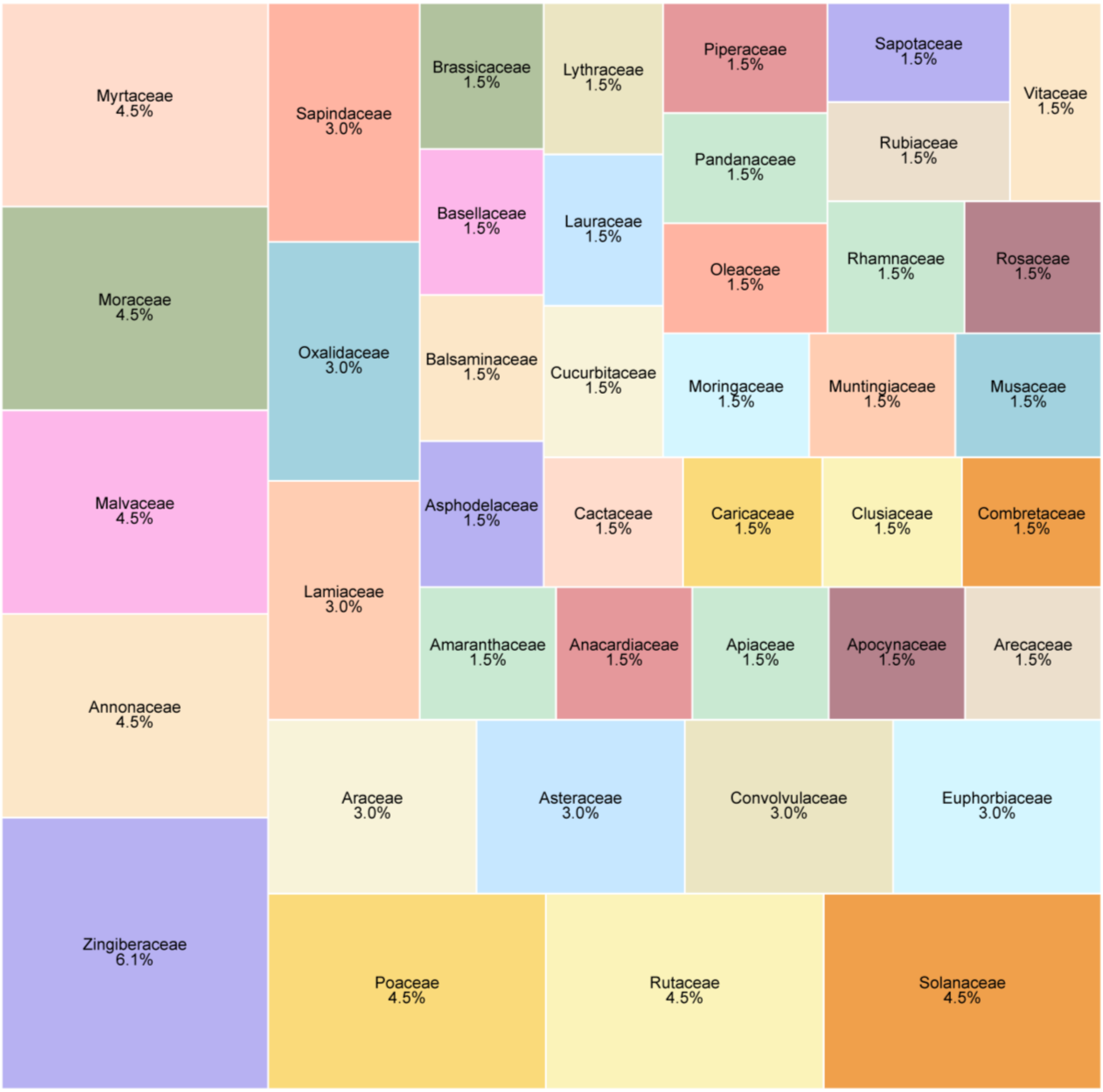

Figure 2. Classification of plant species of percentage family. T: Trees; H: Herbs; V: Vines; B: Bamboos; Fr: Fruits; L: Leaves; Rh: Rhizomes; Fl: Flowers; Tu: Tubers; Tr: Trunk; Fo: Food; Me: Medicine; Cl: Clothing; Co: Construction; Ri: Ritual

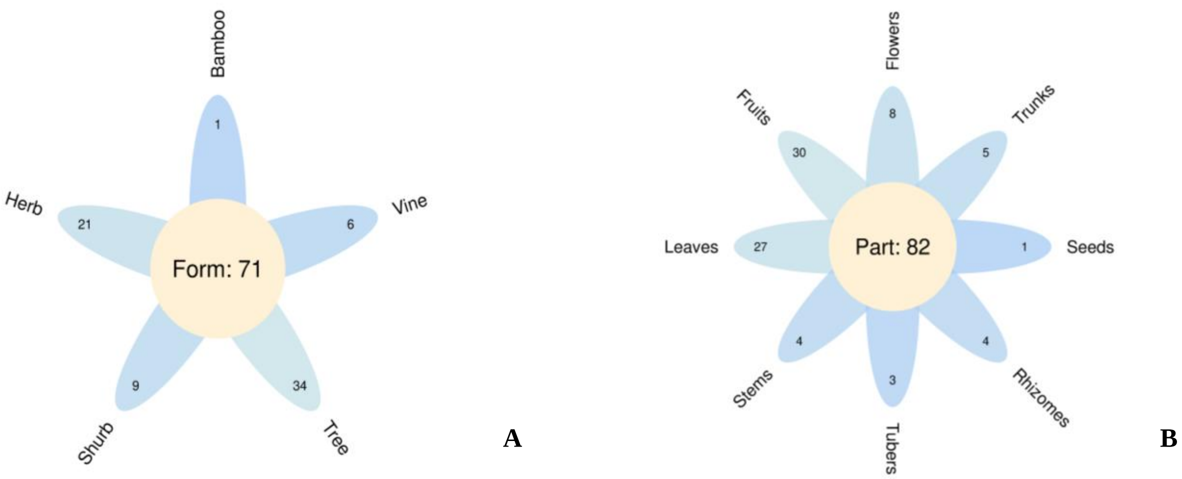

Figure 3. Classification of plant species by life form and part use

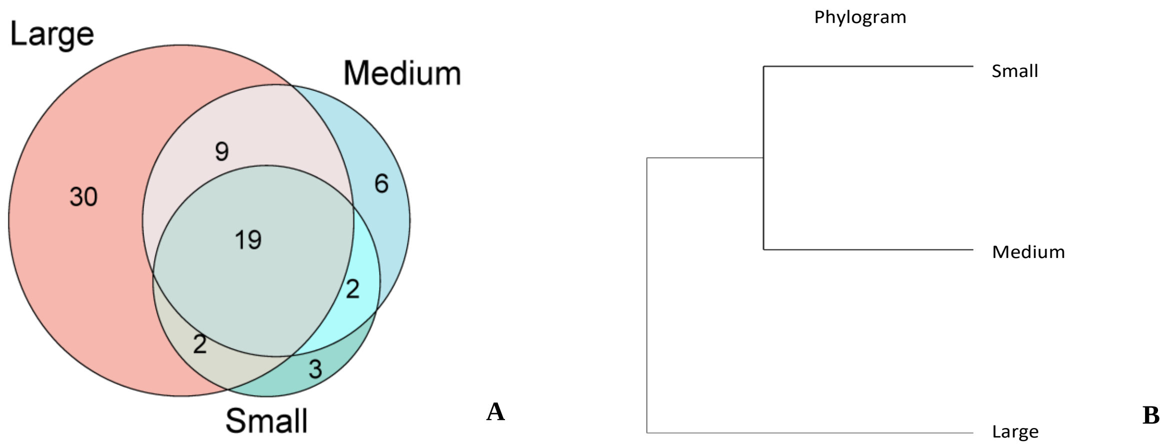

Figure 4. Home garden characteristics based on size: A. Venn diagram showing shared and unique species across small, medium, and large gardens; B. phylogram derived from unweighted pair group method with arithmetic mean (UPGMA) clustering, showing similarity patterns based on species composition. While the Venn diagram shows absolute overlap, the phylogram reflects hierarchical similarity using relative proportions

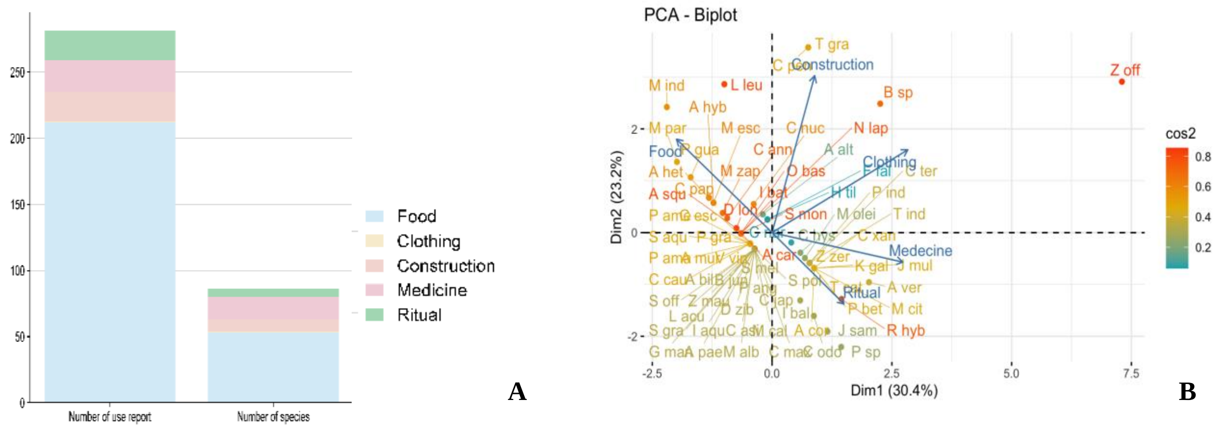

Figure 5. A. Categories of uses categories; B. Principal Component Analysis (PCA) biplot of uses categories in the study area

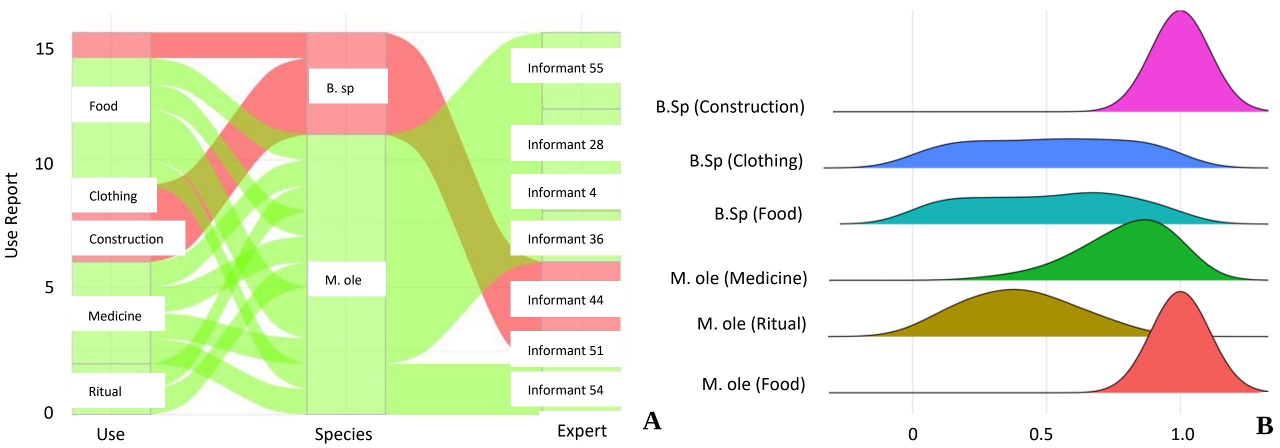

Figure 6. Species with three use categories: A. Frequency distributions across uses, experts, and use categories; B. Bayesian bootstrap

Among all the recorded indices, *M. indica* demonstrated notable cultural and practical importance in Datengan Village. It achieved a UV of 0.411, indicating that it is used for multiple purposes by various respondents. The species was cited by 22 informants, resulting in an FC of 22 and an RFC of 0.393, showing that more than half of the community members acknowledged its relevance. CI for *M. indica* was 0.411, reflecting both the frequency and diversity of its use. Furthermore, it had an RI of 0.883, suggesting its usefulness across several functional categories. CVe was 0.065, placing *M. indica* among the top species valued for both daily utility and cultural significance (Figure 7).

The correlation matrix reveals that several indices, specifically UR, UV, FC, RFC, CI, RI, and CVe, are highly correlated with one another, indicating they may be measuring similar or related constructs. These correlations were not only strong (with values close to 1.00) but also statistically significant, as shown by the low p-values in the significance matrix ($p < 0.01$) (Figure 8). In contrast, NU stands out as an outlier, showing weak correlations with most other variables and non-significant relationships with FC and RFC. This suggests that NU may represent a distinct or unrelated dimension within the dataset. RI and CVe, however, demonstrated strong and significant correlations with nearly all other indices, implying they could serve as good summary indicators for broader trends in the data.

Table 2 presents the Fidelity Level (FL) values for using home garden plants for medicinal purposes. Of 17 species, 12 species exhibit an FL value of 100%, indicating strong agreement among informants regarding their specific use. *Zingiber officinale* demonstrates the most diverse applications, being used to treat flu and cough (40%), fever (20%), boost general immunity (20%), and lower cholesterol (20%).

Discussion

The home garden farming system continues to thrive in Indonesia, particularly within the Javanese community. These gardens are recognized for their high diversity of useful plant species, often exceeding that of other agricultural systems like rice fields. Home gardens also offer greater ecological stability and long-term sustainability. In this study, 71 species were recorded, higher than the diversity reported in several previous studies, such as 60 species in the Tidung Tribe of North Kalimantan (Suciyati et al. 2021), 55 in the Menoreh Karst Area, Purworejo District (Igustita et al. 2023), 22 among the Osing Tribe in Banyuwangi (Hakim et al. 2018), and 64 among the Sundanese in Sumedang (Suwartapradja et al. 2023).

Compared to these regions, the higher species richness observed in this study suggests a more diverse pattern of plant use and management. Respondents indicated that home gardens not only contribute to household food security but also serve as supplementary income sources through the sale of surplus produce. This aligns with findings from other regions where greater species diversity is often linked to more extensive and multifunctional utilization. For example, Prihatini et al. (2018) documented 171 species in the Upstream Citarum Watershed (West Java), highlighting the inclusion of both cultivated and wild species for food, medicine, and cultural practices. Similarly, 85 species were reported among the Batak Karo people (North Sumatra) and 173 species in East Aceh (Suwardi et al. 2023), where plant diversity is closely tied to local knowledge systems and diverse household needs.

Table 2. Fidelity Level (FL) on the use of a medicinal plant for a particular therapeutic application

Scientific name	FL(%)	Instruction
Anredera cordifolia (Ten.) Steenis	100	Boiled and drunk for hypotension, diabetes, and abdominal pain
Aloe vera (L.) Burm.f.	75	Applied fresh aloe vera gel as a hair treatment
	25	Applied fresh aloe vera gel as a skin treatment
Citrus hystrix DC.	75	Squeezed and drunk for cough and sore throat
	25	Squeezed and drunk for sore throat
Cymbopogon nardus L. Rendle	100	Boiled and drunk to help relieve respiratory diseases.
Clitoria ternatea L.	100	Boiled and drunk for diabetes
Curcuma xanthorrhiza D. Dietr	100	Boiled and drunk for general immunity
Jatropha multifida L.	100	The sap as a natural remedy for cuts and wounds
Kaempferia galanga L.	50	Boiled and drunk for fever
	50	Boiled and drunk for general immunity
Morinda citrifolia L.	100	Boiled and drunk for general immunity
Moringa oleifera Lam.	100	Boiled and drunk for diabetes
Piper betle L.	40	Rolled and placed in the nose for nosebleeds
	40	Chewed to support dental and oral health
	20	Boiled and drunk for dysmenorrhea
Pluchea indica (L.) Less.	100	Boiled and drunk for dyspepsia
Rosa x hybrida Schleich. Ex W.D.J.Koch & Ziz	100	Commonly used in traditional remedies for skin care.
Terminalia catappa L.	100	Boiled and drunk for diabetes
Tamarindus indica L.	100	Boiled and drunk for dysmenorrhea
Zingiber officinale Roscoe	40	Boiled and drunk for flu and cough
	20	Boiled and drunk for fever
	20	Boiled and drunk for general immunity
	20	Boiled and drunk for cholesterol
Zingiber zerumbet (L.) Roscoe ex Sm.	100	Boiled and drunk for fever

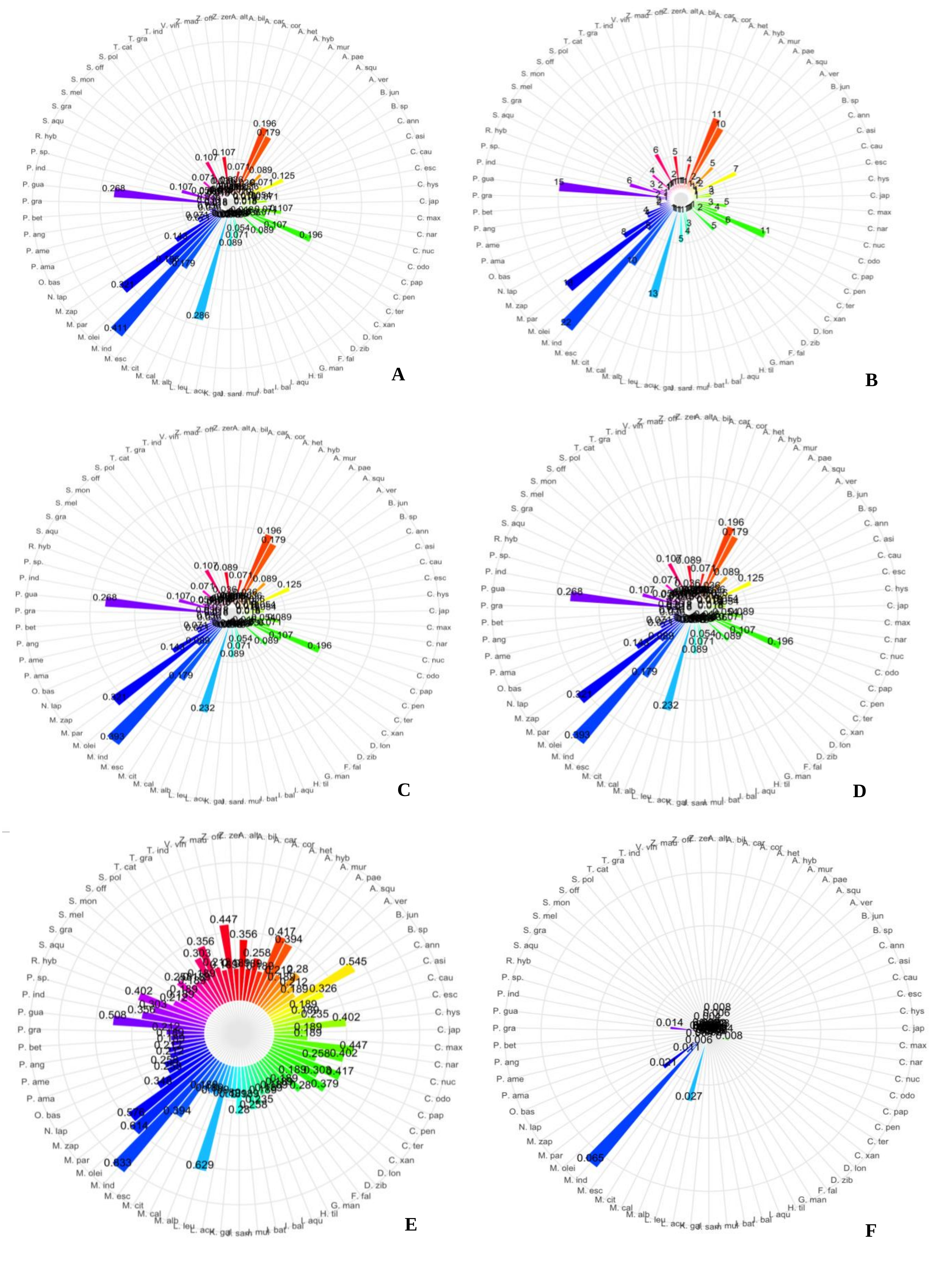

Figure 7. All indexes of quantitative ethnobotany analysis: A. Use Value (UV); B. Frequency of Citation (FC); C. Relative Frequency of Citation (RFC); D. Cultural Importance (CI); E. Relative Importance (RI); F. Cultural Value (CVe)

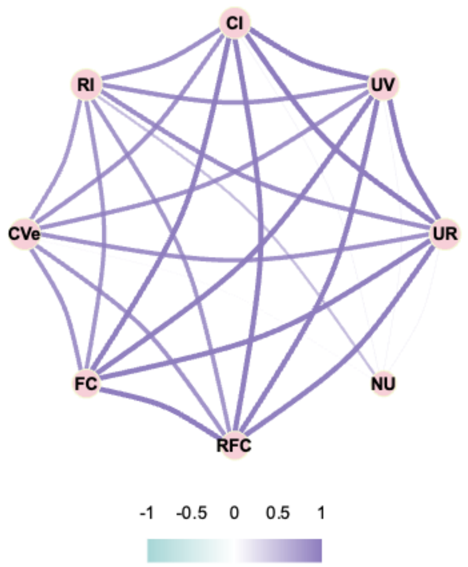

Figure 8. Spearman correlation rank (A) based on all indices, $p < 0.01$

Plant species in home gardens were predominantly cultivated for food, with 53 species identified. The Javanese employ various traditional methods of food preparation involving the selection of essential ingredients, spices, herbs, and complementary components. East Javanese cuisine is characterized by the use of shrimp paste as a flavor enhancer and a slightly spicy taste, with primary cooking methods including boiling, frying, and grilling. According to Afrianto et al. (2021), the Datengan community still utilizes forgotten foods, such as two types of fermented foods, 26 nutrient-rich plant-based foods, 6 by-product foods, and 2 types of mushrooms. This study found that the dominant edible fruit plants included *M. indica*, *A. squamosa*, *A. heterophyllus*, *P. guajava*, *C. papaya*, and *M. paradisiaca*. Plant diversity in home gardens is positively associated with increased dietary diversity, improved nutritional status, and better health outcomes for household members (Whitney et al. 2018; Thamilin et al. 2019; Depenbusch et al. 2022).

During and after the COVID-19 pandemic, home gardens have played a crucial role in strengthening food and nutritional security (Lal 2020). They serve as a practical step toward achieving household-level food resilience (Ferdous et al. 2016). According to interview findings, the food supply in the village remained stable throughout the pandemic. In addition to sourcing food externally, villagers relied heavily on produce from their home gardens. These gardens provided alternative staple foods, kitchen spices, vegetables, and fruits, as well as natural medicinal ingredients, offering a holistic support system for both nutrition and health during the crisis. This reflects their deep connection to nature and the belief that environmental imbalances were divine warnings against exploiting the environment (Afrianto and Metananda 2023).

There were 17 plant species utilized in traditional medicine (Tables 1 and 2). In Javanese tradition, herbal medicine is commonly referred to as *jamu* (Elfahmi et al. 2014). The efficacy of *jamu* is primarily based on practical knowledge passed down through generations, often conveyed orally (Surya et al. 2024). For example, *C. hystrix* leaves were boiled and used as a remedy for coughs. The young leaves of *T. indica* were processed into a traditional herbal drink known as *sinom asem*. The Javanese widely consume this drink to improve blood circulation, reduce menstrual pain, aid weight loss, and alleviate vaginal discharge and constipation (Adriani and Pritasari 2024). Similarly, *Z. officinale* (ginger) was boiled and consumed as a warming drink to treat fever and coughs. During the COVID-19 pandemic, *Z. officinale* gained widespread popularity in Indonesia as a natural immune booster (Boozari and Hosseinzadeh 2021).

The only plant species used for clothing in Datengan Village is *Bambusa* sp. In this community, *Bambusa* sp. is primarily utilized for crafting bags and traditional cone-shaped hats (*caping*). *Caping*, woven from *Bambusa* sp., offers practical advantages over conventional hats, protecting from the sun's heat during hot weather and repelling rainwater in wet conditions. While farmers commonly wear *caping* while working in the fields, it is also used by non-farmers for various outdoor activities. *Bambusa* sp. holds significant importance in Indonesian rural life, serving social, economic, cultural, and ecological functions (Partasasmita et al. 2017; Setiawati et al. 2017). *Gigantochloa apus*, a species from the genus *Gigantochloa* (locally known as *awi tali*), abundantly cultivated in the mixed gardens of Naga Hamlet, Neglasari Village, Tasikmalaya District, is the most preferred bamboo for weaving due to its long, strong, and flexible fibers (Irawan et al. 2019). In addition to household utensils, the people of Cijambu Village, Sumedang District, also utilize *G. apus* as clothesline supports, demonstrating the multifunctionality of bamboo species in daily domestic life (Ihsan et al. 2024).

Home gardens are deeply connected to the cultural identity of ethnic communities and serve as a source of plants for ritual purposes. In Datengan Village, *M. oleifera* is an important plant used in death rituals. According to local beliefs, in Javanese traditions, *M. oleifera* leaves are thought to possess magical properties capable of warding off spirits or negative energies. These leaves are commonly used in traditional rituals to cleanse homes or specific locations from supernatural disturbances. In Datengan Village, *M. oleifera* leaves are also believed to assist individuals who are sick or nearing death by helping them release supernatural influences (Afrianto and Metananda 2023). Meanwhile, flower species such as *Cananga odorata*, *Impatiens balsamina*, *J. sambac*, *Plumeria* sp., and *Rosa* × *hybrida* are commonly used for scattering on graves or during funeral ceremonies. Mukarromah et al. (2024) documented that 27 plant species from 20 families are used in various Javanese traditional rituals, such as mitoni, wedding ceremonies, and grebeg events, each selected for its symbolic meaning and cultural significance.

The Javanese community utilizes a variety of plant species for construction purposes, including *A. altilis*, *Bambusa* sp., *C. nucifera*, *L. leucocephala*, and *M. indica*. These plants serve essential functions in building structures, such as primary building materials, windows, walls, furniture, and foundations. An ethnobotanical study of the communities in Gunung Halimun Salak National Park recorded 50 plant species used for construction and household utilities (Dewi et al. 2023). *Artocarpus altilis* wood is commonly used as building poles, making it a popular choice among the Javanese (Trisulowati 2003). An ethnobotanical study of traditional building materials on the island of Bali revealed that *A. heterophyllus* is commonly used and that species richness varied significantly between villages, reflecting differing levels of traditional knowledge preservation (Sujarwo and Keim 2017). *Cocos nucifera* wood (*glugu*) is cut and split into blocks for roof frames. *Bambusa* sp. is widely used in construction, particularly for rafters, battens, and woven wall materials (*gedhek*). *G. pseudoarundinacea* (*awi surat*), *G. atter* (*awi temen*), and *B. vulgaris* (*haur hejo*) types are traditionally used by the Naga community in Tasikmalaya, West Java, as primary bamboo species for construction, including house floors (*palupuh*), walls (*bilik*), and verandas (*teras*), due to their strong, durable, and thick culms (Irawan et al. 2019). *M. indica* wood is utilized for partitions, walls, doors, windows, and light construction, while *L. leucocephala* wood is often used for light construction and furniture. The selection of wood for construction is primarily based on the durability and strength of plant species that produce hard and long-lasting wood (Ijaz et al. 2017).

In conclusion, home gardens play a crucial role in sustaining the livelihoods of residents in Datengan Village, Kediri District, with 71 plant species from 40 plant families, highlighting the significant contribution of home gardens to Javanese traditional life. Among the 5 basic life needs in Javanese culture, plants are most commonly used for food (53 species), with UR at 212, with fruit and vegetable crops being the dominant species. Further analysis revealed that medium and small home gardens exhibit greater similarity in species use compared to larger ones. *M. indica* showed notable cultural and practical value in Datengan Village, with UV of 0.411, FC of 22, RFC of 0.393, CI of 0.411, RI of 0.883, and CVe of 0.065.

The implications of this study highlight the significance of the high plant diversity recorded in Datengan Village, where 71 species from 43 families were documented. These findings provide strong evidence of the multifunctional role of home gardens in supporting household food security, primary healthcare, and the preservation of traditional ecological knowledge. The identification of key ethnobotanies such as *M. indica*, and *C. nucifera*, which scored high across multiple cultural value indices, offers a strategic reference for designing community-based conservation programs. The added value of this research lies in its ability to inform local policy and rural development initiatives by emphasizing home gardens as low-cost, crucial tools for promoting biodiversity conservation. This emphasis on the role of home gardens in biodiversity conservation should instill a sense of urgency and importance in supporting these initiatives. Moreover, by encouraging knowledge-sharing within the community and fostering intergenerational transmission of plant use practices, this study supports the long-term sustainability of both cultural heritage and agrobiodiversity in rural settings.

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to all those who contributed to the completion of this study. I deeply appreciate all contributions to this research. However, any errors or omissions remain my own.

REFERENCES

Adriani A, Pritasari W. 2024. Literature review: Types and benefits of *jamu* in Indonesia. Biol Educ J 4 (1): 69-79. DOI: 10.25299/baej.2024.16976. [Indonesian]

Afrianto WF, Hasanah LN, Metananda AA. 2023. Diversity of edible plants traded in the East Jakarta traditional markets, Indonesia. Biodiversitas 24 (12): 6953-6968. DOI: 10.13057/biodiv/d241257.

Afrianto WF, Metananda AA. 2023. Revealing the biocultural importance of *Moringa oleifera* (Moringaceae) in three villages, Kediri District, Indonesia. Biodiversitas 24 (12): 6942-6952. DOI: 10.13057/biodiv/d241256.

Afrianto WF, Tamnge F, Hasanah LN. 2020. A relation between ethnobotany and bioprospecting of edible flower butterfly pea (*Clitoria ternatea*) in Indonesia. Asian J Ethnobiol 3 (2): 51-61. DOI: 10.13057/asianjethnobiol/y030202.

Afrianto WF, Tamnge F, Hidayatullah T, Hasanah LN. 2021. Local knowledge of plant-based nutrition sources from forgotten foods in Datengan Village, East Java, Indonesia. Asian J Ethnobiol 4 (1): 53-64. DOI: 10.13057/asianjethnobiol/y040106.

Agustina TP, Hasmiati, Rukmana M, Watung FA. 2024. Ethnobotany and the structure of home garden in Pujon Sub-distict Malang Regency, East Java Indonesia. Ethnobot Res Appl 27: 31.

Boozari M, Hosseinzadeh H. 2021. Natural products for COVID-19 prevention and treatment regarding to previous coronavirus infections and novel studies. Phytother Res 35 (2): 864-876. DOI: 10.1002/ptr.6873.

Castañeda-Navarrete J. 2021. Homegarden diversity and food security in southern Mexico. Food Secur 13 (3): 669-683. DOI: 10.1007/s12571-021-01148-w.

Depenbusch L, Schreinemachers P, Brown S, Roothaert R. 2022. Impact and distributional effects of a home garden and nutrition intervention in Cambodia. Food Secur 14: 865-881. DOI: 10.1007/s12571-021-01235-y.

Dewi AP, Peniwidiyanti P, Hariri MR, Hutabarat PWK, Martiansyah I, Lailaty IQ, Munawir A, Giri MS, Ambarita, E. 2023. Ethnobotany of food, medicinal, construction and household utilities producing plants in Cikaniki, Gunung Halimun Salak National Park, Indonesia. J Mt Sci 20: 163-181. DOI: 10.1007/s11629-021-7108-5.

Elfahmi, Woerdenbag HJ, Kayser O. 2014. Jamu: Indonesian traditional herbal medicine towards rational phytopharmacological use. J Herbal Med 4 (2): 51-73. DOI: 10.1016/j.hermed.2014.01.002.

Faruq MK, Muhdhar MHIA, Sari MS, Mardiyanti L. 2021. Ethnobotany home garden *Karang kitri* in the tourist area of Wurung Crater, Jampit Village, Bondowoso Regency, East Java. AIP Conf Proc 2330: 070001. DOI: 10.1063/5.0043106.

Ferdous Z, Datta A, Anal AK, Anwar M, Khan AMR. 2016. Development of home garden model for year round production and consumption for improving resource-poor household food security in Bangladesh. NJAS-Wageningen J Life Sci 78 (1): 103-110. DOI: 10.1016/j.njas.2016.05.006.

Friedman J, Yaniv Z, Dafni A, Palewitch D. 1986. A preliminary classification of the healing potential of medicinal plants, based on a rational analysis of an ethnopharmacological field survey among Bedouins in the Negev Desert, Israel. J Ethnopharmacol 16 (2-3): 275-287. DOI: 10.1016/0378-8741(86)90094-2.

Hakim L, Pamungkas NR, Wicaksono KP, Soemarno S. 2018. The conservation of Osingnese traditional home garden agroforestry in Banyuwangi, East Java, Indonesia. AGRIVITA J Agric Sci 40 (3): 506-514. DOI: 10.17503/agrivita.v40i3.1605.

Hariyati JR, Hakim L, Batoro J. 2022. Ethnobotany of homegarden in the Island of Gili Iyang, Sumenep Regency. J Indones Tour Dev Stud 10 (2): 65-73. DOI: 10.21776/ub.jitode.2022.010.02.02.

Hidayati AN, Idris J, Marhamah U. 2023. The dynamics of family harmony in the Javanese weton perspective. SHAHIH J Islamicate Multidisciplinary 8 (1): 55-62. DOI: 10.22515/shahih.v8i1.7458.

Ibarra JT, Caviedes J, Altamirano TA, Urra R, Barreau A, Santana F. 2021. Social-ecological filters drive the functional diversity of beetles in homegardens of campesinos and migrants in the southern Andes. Sci Rep 11 (1): 12462. DOI: 10.1038/s41598-021-91185-4.
Igustita I, Fatikha LAY, Astikasari L, Kusuma D, Nugraheni RS, Muryanto BS, Anshory DA, Hidayat S, Sujarta P, Yasa A, Naim DMD, Setyawan AD. 2023. Ethnobotany of medicinal plants in homegarden of Menoreh Karst Area, Purworejo District, Indonesia. Asian J Ethnobiol 6 (2): 171-181. DOI: 10.13057/asianjethnobiol/y060208.
Ihsan M, Irawan B, Iskandar J. 2024. The traditional ecological knowledge of the local people of Cijambu Village, Sumedang, Indonesia, on the diversity, utilization, management, and conservation of bamboo. Biodiversitas 25 (4): 1754-1770. DOI: 10.13057/biodiv/d250446.
Ijaz F, Iqbal Z, Rahman IU, Ali N, Afzal M. 2017. People-plants interaction and its uses: A science of four words "ethnobotany". Altern Intgr Med 6 (1): 1-2. DOI: 10.4172/2327-5162.1000235.
Irawan B, Partasasmita R, Rahayu N, Setiawati T, Iskandar J. 2019. Indigenous knowledge of bamboos by Naga community, Tasikmalaya District, West Java, Indonesia. Biodiversitas 20 (5): 1423-1434. DOI: 10.13057/biodiv/d200535.
Iskandar J, Iskandar BS, Partasasmita R. 2018. Review: The impact of social and economic change on domesticated plant diversity with special reference to wet rice field and home-garden farming of West Java, Indonesia. Biodiversitas 19 (2): 515-527. DOI: 10.13057/biodiv/d190227.
Kufer J, Förther H, Pöll E, Heinrich M. 2005. Historical and modern medicinal plant uses—the example of the Ch'orti 'Maya and Ladinos in eastern Guatemala. J Pharm Pharmacol 57 (9): 1127-1152. DOI: 10.1211/jpp.57.9.0008.
Lal R. 2020. Home gardening and urban agriculture for advancing food and nutritional security in response to the COVID-19 pandemic. Food Secur 12 (4): 871-876. DOI: 10.1007/s12571-020-01058-3.
Linger E. 2014. Agro-ecosystem and socio-economic role of homegarden agroforestry in Jabithenan District, North-Western Ethiopia: Implication for climate change adaptation. SpringerPlus 3: 154. DOI: 10.1186/2193-1801-3-154.
Maningtyas RT, Gunawan A. 2017. Taneyan lanjhang, study of home garden design based local culture of Madura. IOP Conf Ser Earth Environ Sci 91: 012022. DOI: 10.1088/1755-1315/91/1/012022.
Ma'ruf M, Kusumawati IR. 2023. The law and tradition of weton calculation in the Javanese Community of Jombang East Java (Study in Balong Besuk Village, Diwek Jombang). Jurnal Mahkamah: Kajian Ilmu Hukum dan Hukum Islam 8 (2): 237-250. DOI: 10.25217/jm.v8i2.4136.
Mohri H, Lahoti S, Saito O, Mahalingam A, Gunatilleke N, Hitinayake G, Takeuchi K, Herath S. 2013. Assessment of ecosystem services in homegarden systems in Indonesia, Sri Lanka, and Vietnam. Ecosyst Serv 5: 124-136. DOI: 10.1016/j.ecoser.2013.07.006.
Muhlisin M, Iskandar J, Gunawan B, Cahyandito MF. 2021. Vegetation diversity and structure of urban parks in Cilegon City, Indonesia, and local residents' perception of its function. Biodiversitas 22 (7): 2589-2603. DOI: 10.13057/biodiv/d220706.
Mukarromah AN, Dzihni A, Azzam AK, Adiningsih AR, Utami AS, Nazar IA, Sunarto, Iskandar J, Saensouk S, Setyawan AD. 2024. Ethnobotany of traditional rituals of Javanese in the city of Surakarta, Central Java, Indonesia. Asian J Ethnobiol 7 (1): 22-31. DOI: 10.13057/asianjethnobiol/y070103.
Oktavianti E, Hakim L. 2013. Ethnobotany of homestay yards in Tambaksari Tourism Village, Purwodadi, Pasuruan, East Java. J Indones Tour Dev Stud 1 (1): 39-45. DOI: 10.21776/ub.jitode.2013.001.01.06. [Indonesian]
Padmakumar B, Sreekanth NP, Shanthiprabha V, Paul J, Sreedharan K, Augustine T, Jayasooryan KK, Rameshan M, Arunbabu V, Mohan M, Sylas VP, Ramasamy EV, Thomas AP. 2021. Unveiling tree diversity and carbon density of homegarden in the Thodupuzha urban region of Kerala, India: a contribution towards urban sustainability. Trop Ecol 62 (4): 508-524. DOI: 10.1007/s42965-021-00149-2.
Panyadee P, Balslev H, Wangpakapattanawong P, Inta A. 2018. Karen homegardens: Characteristics, functions, and species diversity. Econ Bot 72: 1-19. DOI: 10.1007/s12231-018-9404-8.
Pardo-de-Santayana M. 2003. Las Plantas En La Cultura Tradicional De La Antigua Merindad De Campoo. [Dissertation]. Universidad Autónoma de Madrid, Spain. [Spanish]
Park JH, Woo SY, Kwak MJ, Lee JK, Leti S, Soni T. 2019. Assessment of the diverse roles of home gardens and their sustainable management for livelihood improvement in West Java, Indonesia. Forests 10 (11): 970. DOI: 10.3390/f10110970.
Partasasmita R, An'amillah A, Iskandar J, Mutaqin AZ, Annisa. 2017. Karangwangi people's local knowledge of bamboo and its role: Implications for management of cultural keystone species. Biodiversitas 18 (1): 275-282. DOI: 10.13057/biodiv/d180136.
Prihatini J, Iskandar J, Partasasmita R, Nurjaman D. 2018. The impacts of traditional homegarden conversion into the commercial one: A case study in Sukapura Village of the Upstream Citarum Watershed, West Java, Indonesia. Biodiversitas 19 (5): 1926-1940. DOI: 10.13057/biodiv/d190545.
Putri AN, Husnayain F, Fauziah F, Nurjannah K, A'yun NQ, Al-Atsariyah NH, Rohana N, Janah RR, Hidayat F, Khoeruzaad B. 2024. The relevance of weton calculation tradition in Javanese culture in determining marriage contracts: A sharia perspective. Demak Universal J Islam Sharia 2 (3): 243-256. DOI: 10.61455/deujis.v2i03.139.
Reyes-García V, Huanca T, Vadez V, Leonard W, Wilkie D. 2006. Cultural, practical, and economic value of wild plants: A quantitative study in the Bolivian Amazon. Econ Bot 60 (1): 62-74. DOI: 10.1663/0013-0001(2006)60[62:CPAEVO]2.0.CO;2.
Setiani S, Setiawan E, Huang WC. 2022. Taneyan lanjang shared home gardens and sustainable rural livelihoods of ethnic Madurese in Madura Island, Indonesia. Sustainability 14 (10): 5960. DOI: 10.3390/su14105960.
Setiawati T, Mutaqin AZ, Irawan B, Anamillah A, Iskandar J. 2017. Species diversity and utilization of bamboo to support lifes the community of Karangwangi Village, Cidaun Sub-District of Cianjur, Indonesia. Biodiversitas 18 (1): 58-64. DOI: 10.13057/biodiv/d180109.
Suciyati A, Suryadarma IGP, Paidi, Abrori FM. 2021. Ethnobotanical study based on the five dimensions of basic life needs in Tidung Tribe of North Kalimantan, Indonesia. Biodiversitas 22 (6): 3199-3208. DOI: 10.13057/biodiv/d220623.
Sujarwo W, Keim AP. 2017. Ethnobotanical study of traditional building materials from the island of Bali, Indonesia. Econ Bot 71: 224-240. DOI: 10.1007/s12231-017-9385-z.
Surya R, Romulo A, Nurkolis, F, Kumalawati DA. 2024. Compositions and health benefits of different types of *jamu*, traditional medicinal drinks popular in Indonesia. In Mérillon JM, Riviere C, Lefèvre G. (eds.). Natural Products in Beverages. Reference Series in Phytochemistry. Springer, Cham. DOI: 10.1007/978-3-031-38663-3_123
Suwardi AB, Navia ZI, Mubarak A, Mardudi M. 2023. Diversity of home garden plants and their contribution to promoting sustainable livelihoods for local communities living near Serbajadi protected forest in Aceh Timur region, Indonesia. Biol Agric Hortic 39 (3): 170-182. DOI: 10.1080/01448765.2023.2182233.
Suwartapradja OS, Iskandar J, Iskandar BS, Mulyanto D, Suroso, Nurjaman D, Nisyapuri FF. 2023. Plants diversity and socioecological functions of homegarden in Sundanese rural area: A case in Sumedang District, West Java, Indonesia. Biodiversitas 24 (1): 156-175. DOI: 10.13057/biodiv/d240120.
Thamilin J, Wekumbura C, Mohotti AJ, Kumara AP, Kudagammana ST, Silva KDRR, Frossard E. 2019. Organized homegardens contribute to micronutrient intakes and dietary diversity of rural households in Sri Lanka. Front Sustain Food Syst 3: 94. DOI: 10.3389/fsufs.2019.00094.
Trisulowati R. 2003. Traditional residential buildings of Central Java. Mintakat: J Arsitektur 4 (1): 31-38. DOI: 10.26905/mintakat.v4i1.1957. [Indonesian]
Whitney C. 2021. Quantitative ethnobotany analysis with ethnobotany R. Available from: https://cran.r-project.org/web/packages/ethnobotanyR/vignettes/ethnobotanyr_vignette.html. Accessed 27 June 2024.
Whitney CW, Luedeling E, Hensel O, Tabuti JRS, Krawinkel M, Gebauer J, Kehlenbeck K. 2018. The role of homegardens for food and nutrition security in Uganda. Hum Ecol 46: 497-514. DOI: 10.1007/s10745-018-0008-9.