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EXOTIC WILD PLANTS, CULTURAL ADAPTATION, AND LOCAL FOOD DIVERSITY IN MEKARSARI, A TEA ESTATE'S BUFFER-VILLAGE IN WEST JAVA, INDONESIA

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ABSTRACT
AULIA, S. A. Z., MULYANTO, D., ISKANDAR, B. S. & ISKANDAR, J. 2026. Exotic wild plants, cultural adaptation, and local food diversity in Mekarsari, a tea estate's buffer-village in West Java, Indonesia. *Reinwardtia* 25(1): 13–29. — This research examines the ethnobotanical knowledge of exotic wild plants utilized as complementary food in Tegallega hamlet, a part of the buffer village adjacent to a historic tea estate in West Java, Indonesia. Through semi-structured interviews and field surveys with 22 local informants, 42 exotic wild plants from 22 families were recorded, primarily from Asteraceae and Solanaceae. Predominant species were herbaceous neophytes introduced during or after European colonization, illustrating the historical impact of the Columbian Exchange and plantation practices. Leaves were the most commonly used plant part, frequently consumed as *lalapan*, an essential ingredient of Sunda cuisine. The community emphasizes readily accessible resources that require the least effort, consistent with optimal foraging theory, whereas gender roles markedly affect foraging practices—women generally collect plants near villages, whereas men tend to explore farther into the forest. The incorporation of these exotic wild plants into local diets underscores cultural adaptation and the enhancement of local knowledge. Using exotic wild plants sparingly can enhance conservation of native and endemic species, lessen the negative effects of invasive species, and create opportunities for ecotourism growth. This study highlights the interaction of historical, ecological, and cultural factors that influence local plant utilization practices.

Key words: Complementary food, ethnobotany, exotic plants, Sundanese cuisine, tea plantation.

ABSTRAK
AULIA, S. A. Z., MULYANTO, D., ISKANDAR, B. S. & ISKANDAR, J. 2026. Tumbuhan liar eksotis, adaptasi budaya, dan keragaman pangan lokal di Mekarsari, desa penyangga perkebunan teh di Jawa Barat, Indonesia. *Reinwardtia* 25(1): 13–29. — Penelitian ini mengkaji pengetahuan etnobotani tumbuhan liar eksotik yang digunakan sebagai makanan pelengkap di Kampung Tegallega, bagian dari sebuah desa penyangga di sekitar perkebunan teh bersejarah di Jawa Barat, Indonesia. Melalui wawancara semi-terstruktur dan survei lapangan dengan 22 informan, tercatat 42 jenis tumbuhan liar eksotik dari 22 suku, mayoritas berasal dari suku Asteraceae dan Solanaceae. Sebagian besar jenis merupakan herba neofit yang diintroduksi selama atau setelah masa kolonial Eropa yang mencerminkan pengaruh sejarah dari Pertukaran Columbus serta praktik perkebunan. Daun merupakan bagian tumbuhan yang paling banyak dimanfaatkan, sering dikonsumsi sebagai lalapan, makanan penting dalam kuliner Sunda. Penduduk cenderung memanfaatkan sumber daya yang paling mudah diakses dengan upaya yang minimal, sejalan dengan teori *optimal foraging*. Selain itu, peran gender memengaruhi praktik ini, perempuan lebih sering mengumpulkan tumbuhan di sekitar permukiman, sedangkan laki-laki menjelajah ke area hutan. Penggunaan tumbuhan liar eksotik dalam pola kon-

sumsi lokal menunjukkan adanya adaptasi budaya dan pengayaan pengetahuan lokal. Pemanfaatan tumbuhan liar eksotik dapat membantu mengurangi efek negatif jenis invasif, mendukung pelestarian jenis asli dan endemik, serta membuka peluang untuk pengembangan ekowisata. Studi ini menekankan pentingnya interaksi antara faktor sejarah, ekologi, dan budaya dalam membentuk praktik pemanfaatan tumbuhan oleh masyarakat lokal.

Kata kunci: Etnobotani, makanan pelengkap, masakan Sunda, perkebunan teh, tumbuhan eksotik.

INTRODUCTION

Some species of wild plants commonly harvested by local communities are actually non native to the area (Gras *et al.,* 2019; Łuczaj *et al.,* 2024; Lautenschläger *et al.,* 2018; Motti & Motti, 2017; Motti, 2022). This phenomenon can also be found in West Java, an area widely known as a rich source of exotic plant species in Indonesia. West Java is one of the most fertile regions in Indonesia due to its volcanic environment and abundant rainfall. It is also an essential area in Indonesia for studying the dynamic relationship between humans and plants within a biocultural context. Ethnobotany provides a useful framework for examining local knowledge, beliefs, and resource-management practices related to plants (Albuquerque *et al.,* 2017; Hurrell, 2016; Toledo, 2002). Numerous ethnobotanical studies have been conducted in the province, but most of them have focused on how wild plants contribute to income generation, nutrition, and food security for residents (Kulsum & Susandarini, 2023; Rahayu *et al.,* 2024; Sriwahjuningsih & Putri, 2022; Yanty *et al.,* 2024). Much of this work has focused on wild medicinal plants, with little focus on other categories, such as exotic wild plants (Aulia & Mulyanto, 2024; Rahayu *et al.,* 2024; Fatimah & Mulyanto, 2025). Furthermore, surveys conducted in West Java have also shown a gradual decline in the use of wild plants due to rarity and declining local knowledge, highlighting the need for further research (Pratama *et al.,* 2019; Rahayu *et al.,* 2024; Aulia & Mulyanto, 2024; Aulia *et al.,* 2025).

In 1909, the Dutch botanist Cornelis Andries Backer documented 153 plant species naturalized in Java, a number that had increased to around 300 by 1928. Backer also concluded that one of the naturalization centers for exotic plants on the island of Java is the plantations surrounding (see also Backer, 1928). This pattern shows the global tendency of plant homogenization since the Columbian Exchange, when plant species from other continents were extensively introduced and grown throughout the tropics, including Southeast Asia (Voeks, 2013). During this colonial period of Java's history, concurrent with the introduction of new crops and plantation plants from the American continent, colonists also brought in other exotic plants with little or no food use, accidentally or deliberately (Kudo *et al.*, 2014; Padmanaba *et al.,* 2017; Pols, 2009; Rahmawati & Rosleine, 2023). At present, in areas near plantations, some of these plants have not only become naturalized but are also used by local people as complementary food. However, no single study presents a detailed list of these species, including their cultural contexts. The diversity and abundance of exotic wild plants have also not been systematically studied ethnobotanically for the plantation ecosystems of Java's mountainous regions (Handayani & Hidayati, 2020; Handayani *et al.,* 2021), and exotic wild plants have not received enough scientific attention, although it has been documented that some of them are components of local subsistence (Junaedi *et al.,* 2021; Handayani *et al.,* 2021; Farikha *et al.,* 2024; Triyanto *et al.,* 2024).

From an evolutionary ethnobotany perspective, integration of exotic plants into local knowledge and practices helps fill the gaps left by native species, diversifies the botanical repertoire, and expands treatment options for diseases within local health systems (Gama *et al.,* 2018; Silva *et al.,* 2024). On the other hand, the use of exotic wild plants may divert harvesting pressure from native species, especially endemic ones, thereby contributing, albeit unintentionally, to their conservation and ecological sustainability. Therefore, the aim of this ethnobotanical study is to document local knowledge of exotic wild plants and their use as complementary food by residents of one of the oldest tea plantations in West Java (Gambung). This study also investigates how the integration of exotic wild plants impacts food security, consumption patterns, and ecological sustainability.

MATERIALS AND METHODS

Study Site

This field study was conducted in Tegallega hamlet, Mekarsari Village, Pasirjambu District, Bandung Regency, West Java, Indonesia (7° 13'36.9"S; 107°51'84.1"E) (Fig. 1). The village and its farmland are located between two historical landscapes: Gambung Tea Estate and Mount Tilu Nature Reserve. The 600-hectare tea plantation in the north is one of the oldest in West Java. It was established in 1874 by a Dutch planter, Rudolph Eduard Kerkhoven, and is still run by a state-

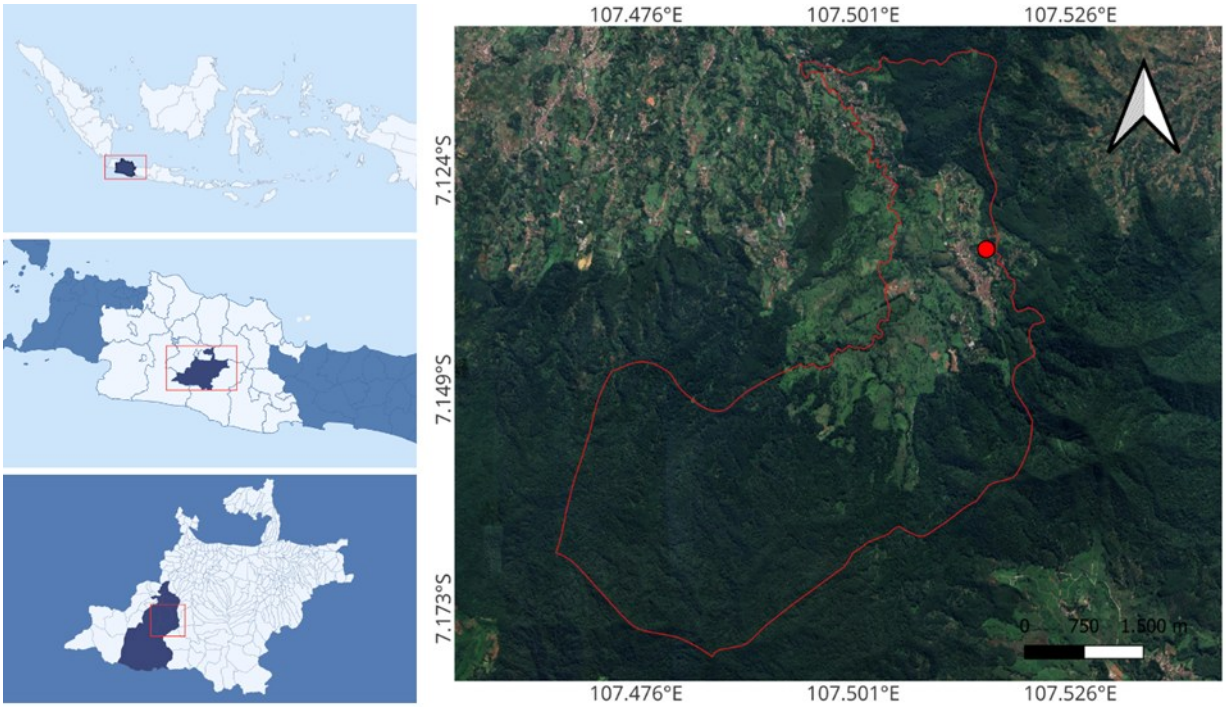

Fig. 1. Study site in Mekarsari Village, Pasirjambu District, Bandung Regency, West Java, Indonesia.

owned enterprise. Due to similar geographical and climatic conditions, this is one of the places in Java where tea and cinchona plants were commonly found. The Mount Tilu Nature Reserve currently covers an area of 8,000 hectares and is the largest nature reserve that located in Bandung Regency.

The village has a cool climate, with annual temperatures ranging from 16°C to 25°C, rarely dropping 14°C below or exceeding 27°C. It is located at an altitude of 1,000-1,800 meters. The average annual rainfall is about 2,068 mm, and the region has a distinct rainy season lasting for seven months from October to May. These factors create favorable conditions for a variety of environmental and agricultural ventures. The growth of tea plantations during the colonial period established the village's historical status as a buffer village, and its cool climate encouraged locals to produce temperate vegetables such as lettuce, leeks, cauliflower, carrots, cabbage, potatoes, and tomatoes for the European and Chinese settlers. These products are still grown today and supply the urban markets in Bandung, the capital of West Java province, 40-50 km to the north. Since 2015, some farmers have also been cultivating coffee on the northern foothills of Mount Tilu.

With a population density of 310 people/km^2, most inhabitants are small farmers who own less than 1 hectare of land. Fewer than 5% of those farmers own land; the rest belong to the rural working class and make a living from farming, tea growing, or both. Thanks to its colonial history and beautiful location on the tea plantations, the village has, in recent years, been working to diversify its economy through tourism.

Data Collection

In the study area, knowledge of wild plants as dietary supplements is considered to be a specific cultural domain. In the pilot study, respondents frequently pointed out others they considered more suitable and deserving to be interviewed because they recognized as having this knowledge. Using the snowball technique, 22 study participants (13 men and 9 women) were interviewed. The informants were aged between 39 and 79 years and worked as tea plantation workers, smallholder farmers, and agricultural labourers. The interviews were conducted in various locations, including households, tea plantations, coffee agroforests, and farms, with participants' consent. To facilitate communication and ensure accuracy of information, all interviews were conducted and recorded in Sundanese, the native language spoken in Western Java.

Data on exotic wild plants used as supplementary foods were collected through open descriptions (free-listing and free-walking) and semi-structured interviews and included informants' knowledge of plant vernacular names, plant's morphological characteristics, habitat distribution, harvesting time, methods and tools, as well as use categories.

Plant samples were collected and recorded with local names provided by informants to confirm scientific nomenclature. Specimens were verified in the field using the *Flora of Java* (Backer & Bakhuizen den Brink Jr, 1968) and the *Mountain Flora of Java* (van Steenis, 1972). Some were identified by plant taxonomists and stored in the Herbarium Jatinangoriense (UNPAD), adminis-

tered by the Department of Biology, Padjadjaran University, located in Sumedang, West Java. This procedure ensured the validity of the plant identification data. Scientific names were additionally cross-checked using Plants of the World Online (POWO, 2024).

Data Analysis

After the interviews, all collected information, including plant name, plant classification, life form, biogeographical distribution, habitat type, harvest time, collection method and tools, parts used, use categories, and number of citations, was tabulated and organized using Microsoft Excel 2016. The organized data were presented in grid charts, tables, and Venn diagrams. The following formula was also used to calculate the data based on the relative frequency of citation (RFC) index (Tardío & Pardo-de-Santayana, 2008):

$$RFC = \frac{FC}{N}$$

Where FC is the number of informants mentioning a species, and N is the total number of informants. The RFC value ranges from 0 to 1, with 1 indicating that the species was mentioned by all informants.

To determine the species similarity among various site categories (in the village, around the village, and forest), Sørensen's similarity coefficient was used. The evaluation results ranged between 0 and 1, and the formula was expressed as follows (Araújo & Ferraz, 2014):

$$SSC = \frac{2a}{a+b+c}$$

Where:
SSC = Sørensen's Similarity Coefficient
a = Number of species with simultaneous occurrence in site 1 and site 2
b = Number of species that occur only in site 1
c = Number of species that occur only in site 2

Qualitative data, including the methods used, the uses of exotic wild plants, the sources of knowledge about exotic wild plants, and the stories informants told, were qualitatively analyzed to construct a narrative. This process involved cross-checking, summarizing, and synthesizing.

RESULTS

Botanical Characteristics

The result of this study indicates that 42 exotic species were collected, harvested, and consumed by local people. These plants belong to 34 genera from 22 families (Table 1). The Asteraceae has the highest number of species represented with seven species (16%) of the total (Fig. 2) followed by Solanaceae with five species (12%), Euphorbiaceae, Fabaceae, and Oxalidaceae, each with three species.

As shown in Fig. 3, 34 species (81%) of the exotic wild plant species are herbaceous, with perennial herbs forming the largest group (22 species; 52%), followed by annual herbs (12 species; 29%).

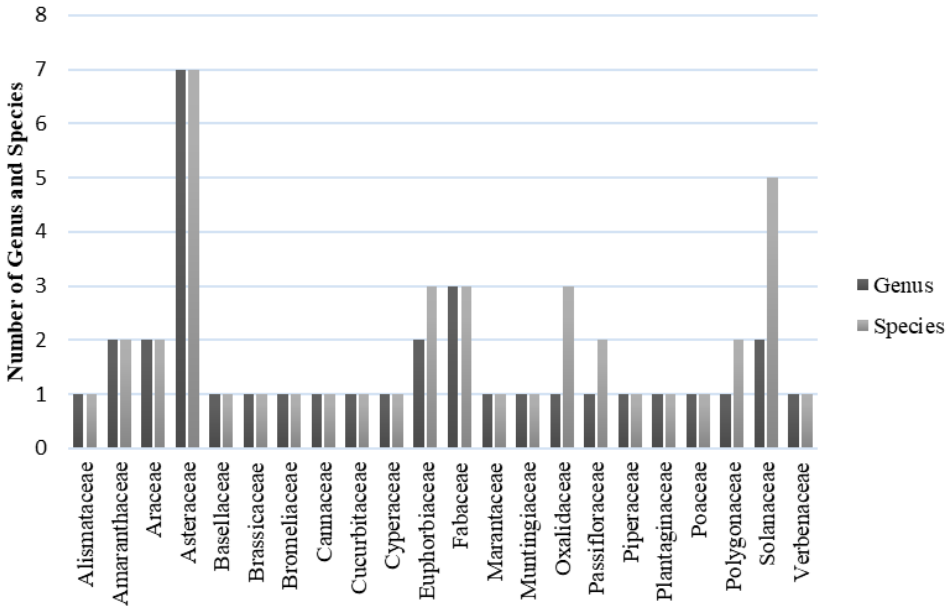

Fig. 2. Distribution of genera and species in plant families.

Table 1. List of exotic wild plants used as complementary food in the study site.

Scientific name	Life form	Part used	Native range (simplified)	RFC
Acmella oleracea (L.) R.K.Jansen, Asteraceae	Perennial herb	Leaves	Nt	0.68
Alternanthera philoxeroides (Mart.) Griseb., Amaranthaceae	Perennial herb	Leaves	Nt	0.18
Amaranthus blitum L., Amaranthaceae	Annual herb	Leaves	Nt, Cp	0.95
Ananas comosus (L.) Merr., Bromeliaceae	Perennial herb	Fruits	Nt	0.72
Anredera cordifolia (Ten.) Steenis, Basellaceae	Perennial herb	Leaves	Nt	0.54
Bambusa vulgaris Schrad. ex J.C.Wendl., Poaceae	Bamboo	Shoots	Im	0.86
Bidens pilosa L., Asteraceae	Annual herb	Leaves	Nt, Cp	0.82
Canna indica L., Cannaceae	Perennial herb	Tubers	Nt, Ha	0.77
Crassocephalum crepidioides (Benth.) S.Moore, Asteraceae	Annual herb	Leaves	Af	1
Cyclanthera brachystachya (DC.) Cogn., Cucurbitaceae	Annual herb	Fruits	Nt	1
Erigeron sumatrensis Retz., Asteraceae	Annual herb	Leaves	Nt	0.68
Euphorbia heterophylla L., Euphorbiaceae	Annual herb	Leaves	Nt	0.36
Euphorbia thymifolia L., Euphorbiaceae	Annual herb	Leaves, stems	Nt, Ha	0.68
Galinsoga parviflora Cav., Asteraceae	Annual herb	Leaves	Nt, Cp, Ha	0.27
Lantana camara L., Verbenaceae	Shrub	Fruits	Nt	0.22
Leucaena leucocephala (Lam.) de Wit, Fabaceae	Tree	Seeds	Nt	1
Limnocharis flava (L.) Buchenau, Alismataceae	Perennial herb	Aerial parts	Nt	1
Maranta arundinacea L., Marantaceae	Perennial herb	Tubers	Nt	0.73
Mimosa pigra L., Fabaceae	Shrub	Roots	Nt, Ha	0.13
Muntingia calabura L., Muntingiaceae	Tree	Fruits	Nt	0.86
Nasturtium officinale W.T.Aiton, Brassicaceae	Perennial herb	Aerial parts	Ha, Sa, Af, Im	1
Oxalis barrelieri L., Oxalidaceae	Perennial herb	Aerial parts	Nt	0.13
Oxalis corniculata L., Oxalidaceae	Perennial herb	Fruits	Ha, Im	0.13
Oxalis triangularis A.St.-Hil., Oxalidaceae	Perennial herb	Tubers, stems	Nt	0.68
Passiflora edulis Sims, Passifloraceae	Perennial herb	Fruits	Nt	1
Passiflora ligularis Juss., Passifloraceae	Shrub	Fruits	Nt	1
Peperomia pellucida (L.) Kunth, Piperaceae	Annual herb	Leaves	Nt, Ha, Af	0.18
Physalis angulata L., Solanaceae	Annual herb	All parts	Nt, Ha	1
Physalis peruviana L., Solanaceae	Perennial herb	All parts	Nt	1
Plantago major L., Plantaginaceae	Perennial herb	All parts	Ha, Sa	0.86
Ricinus communis L., Euphorbiaceae	Shrub	Fruits	Af	0.23
Rhynchospora colorata (L.) H.Pfeiff., Cyperaceae	Perennial herb	Rhizomes	Nt, Ha	0.09
Rumex rugosus Campd., Polygonaceae	Perennial herb	Leaves	Ha	0.77
Rumex patientia L., Polygonaceae	Perennial herb	Leaves	Ha, Sa, Im	0.5
Schismatoglottis calyptrata (Roxb.) Zoll. & Moritzi, Araceae	Perennial herb	Aerial parts	Im	0.68
Senna occidentalis (L.) Link, Fabaceae	Perennial herb	Seeds	Nt	0.5
Solanum americanum Mill., Solanaceae	Annual herb	Fruits, leaves	Nt, Ha	0.86
Solanum nigrum L., Solanaceae	Perennial herb	Fruits, leaves	Ha, Sa, Af, Im	0.91
Solanum torvum Sw., Solanaceae	Perennial herb	Fruits	Nt	1
Taraxacum officinale F.H.Wigg., Asteraceae	Perennial herb	Leaves	Ha, Sa	0.91
Tithonia diversifolia (Hemsl.) A.Gray, Asteraceae	Shrub	Leaves	Nt	0.09
Xanthosoma sagittifolium (L.) Schott, Araceae	Annual herb	Tubers	Nt	0.54

Note: Af=African realm, Im=Indo-Malesian realm (exclude Java), Cp=Chile-Patagonian realm, Nt=Neotropical realm, Ha=Holarctic realm, Sa=Saharo-Arabian realm.

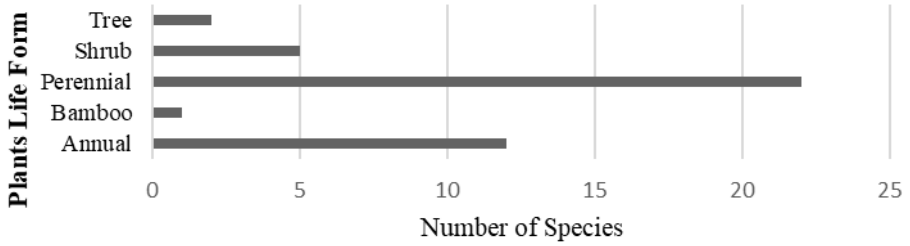

Fig. 3. The distribution of plant life forms.

A smaller number of shrubs (five species), trees (two species), and bamboo (one species) are also included.

Floral Biogeographic Distribution

This study found that more than half of the total, 22 wild plant species (52.38%) are exclusively native to the Neotropical realm, alongside 6 species that are also native to the Holarctic realm, and some species that are shared with the Chile-Patagonian realm (Fig. 4). Only one species was exclusively native to the Holarctic realm, whilst others were also native to the Indo-Malesian, African, and Saharo-Arabian realms. One species was native to the Holarctic and Saharo-Arabian regions, as well as to the Holarctic and Indo-Malesian regions.

Distribution of Habitat

Our findings show that exotic wild plants used as complementary food have been collected from several collection sites. These locations are divided into three main categories by their distance from the village: in the village, around the village, and in the forest. The first category consists of home gardens, roadsides, and artificial pools; the second category mainly consists of farmlands, uncultivated lands, tea plantation gardens, natural pools, and waterways; and the third category includes forest and coffee agroforests. Some plants may inhabit more than one site category (Fig. 5).

One exotic species, garden sorrel (*Rumex rugosus*), was found exclusively in the village, specifically in the home garden, whereas five species (12%), including cuchinito (*Cyclanthera brachystachya*) were found at tea plantation gardens around the village. Passion fruit (*Passiflora edulis*) was one of two species identified solely in the forest. Sixteen species (38%), including Mexican sunflower (*Tithonia diversifolia*), were found in both the village and around the village, while three species, such as Madeira-vine (*Anredera cordifolia*), were identified in both the village and the forest. In this study, tall fleabane (*Erigeron sumatrensis*) and giant sensitive tree (*Mimosa pigra*), which are usually considered weeds in home gardens, farmland, and coffee agroforests, are among the ten exotic species (24%) that were found across the three categories.

Based on Sørensen's similarity coefficient, inner villages and the surrounding area have the highest similarity (0.79). In contrast, the lesser similarities occur between the area around the village and the forest (0.54), and further between the village and

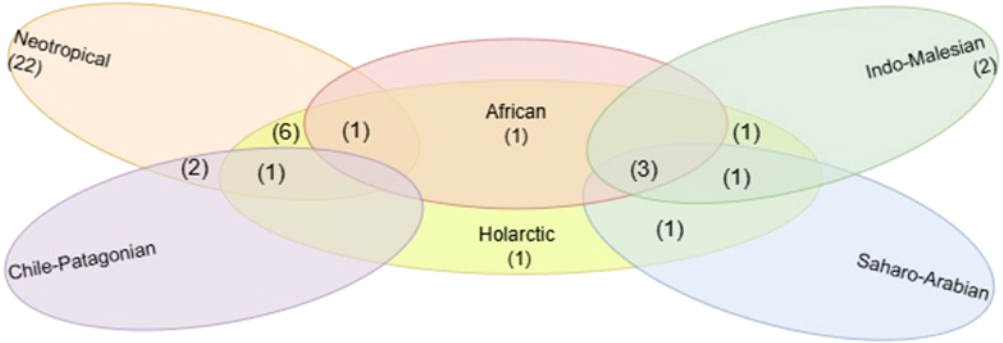

Fig. 4. Native realms of wild exotic plants.

Fig. 5. Distribution of foraging sites.

the forest (0.52). This indicates that although certain exotic species may spread, their growth is constrained by ecological differences and a lack of human influence. The forest's conditions and the greater effort required for foraging make it a less favorable area for plant collecting, further decreasing similarity in plant composition.

Foraging Seasons and Methods

All-season plants, which can be foraged year-round, dominate the resource with 25 species (64%). The all-season category is largely filled by plants that produce leaves and aerial parts to consume, reflecting their steady availability, such as creeping wood sorrel (*Oxalis corniculata*). During the dry season, the number of harvested species decreases to 12 species (29%). Because above-ground sections are less accessible or nutrient-dense during this period, the emphasis switches to underground components, such as tubers of tania (*Xanthosoma sagittifolium*). Seeds and mature fruits are also collected as they are often ready during the dry season after the wet-season growth. During the dry season, locals typically gather wild fruit plants while searching for firewood.

The variety further reduces to only five species (12%) in the wet season. Tender parts like leaves, shoots, and some fruits grow faster during the wet season and are primarily collected at this time. For example, beggarsticks (*Bidens pilosa*) leaves are more frequently collected during the wet season since the plant grows abundantly, the leaves are softer, bigger, greener, and it is easier to pick them without the disturbance of sharp and dry seeds as in the dry season.

Depending on the plant's condition, locals either used a single method or combined several methods to collect exotic wild plants. Overall, 36 species (86%) included in this study are commonly collected by handpicking (Fig. 6). The handpicked method is mostly used for herbaceous plants, such as toothache plant (*Acmella oleracea*). Handpicked methods are sometimes combined with other tools, such as a machete, to collect lead tree (*Leucaena leucocephala*), making it easier to collect its fruit by hacking down its branches. Hand-picking, along with the use of poles, is used to collect the sweet fruits of the Jamaica cherry (*Muntingia calabura*), which usually grows along roadsides. The fruit frequently develops on tall branches. To simplify picking the fruits from the ground, a pole is used to shake or knock them down. Combining handpicking with tools is a useful strategy to get around challenges like plant height and improve efficiency.

The remaining six species can be collected in various ways. Four plants were gathered by digging and using machetes. These are usually plants with underground or near-ground parts and hard parts, such as the tubers of Indian shot (*Canna indica*). Two plants are collected solely with a machete. A machete is usually used to collect plants with hard, spiny parts, such as *Ananas comosus*.

Utilizations

Of these, leaves were the most used part (Fig. 7), with 14 species (33%), including *Rumex patientia* that usually eaten raw. With nine species (21%), including tickberry (*Lantana camara*), fruits were the second most widely eaten part. Furthermore, 8% of species used both aerial parts and all parts; Turkey berry (*Solanum torvum*) is an exam-

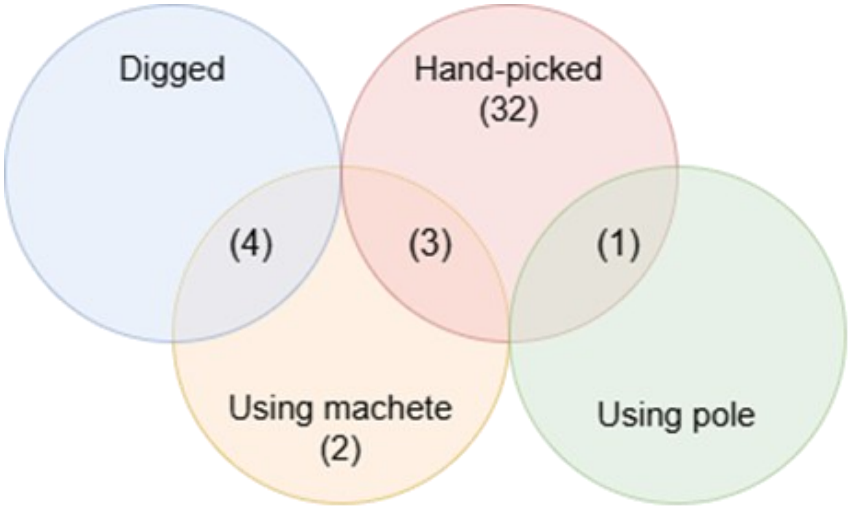

Fig. 6. Distribution of plants collecting methods.

ple of the latter, with fruits consumed as vegetables, or the root and stem decocted into a beverage. Some plants, like false shamrock (*Oxalis triangularis*), which combines tubers and stems usage, and *Solanum nigrum,* which is used for both its fruits and leaves, showed multi-part usage. Other plant parts are less commonly used, such as coffee senna (*Senna occidentalis*) seeds for making beverages.

Among the various food categories considered, 81% of the total species were restricted to a single category (Fig. 8). Vegetables were the largest group (20 species), followed by beverages (six species), desserts (five species), and snacks (three species). Additionally, there were two combination categories: vegetable and beverages (six species) and dessert and beverage (two species). Vegetables can be eaten raw, cooked, or both. For example, Guernsey pigweed (*Amaranthus blitum*) leaves are usually cooked, either boiled or stir-fried.

Sweet granadilla (*Passiflora ligularis*) fruits are eaten raw and are categorized as a dessert. In the beverage category, decoction is a primary method, such as a decoction of the root of whitetop sedge (*Rhynchospora colorata*), which was used for medicine. In Tegallega, snacks are eaten at night or early afternoon. Snacks are usually made from boiled tubers, for example, arrowroot (*Maranta arundinacea*). The leaves and stems of Gulf sandmat (*Euphorbia thymifolia*) were utilized in both the vegetable and beverage categories. Cooked *Euphorbia thymifolia* is utilized as food, and its decoction is used as medicine. Meanwhile, cutleaf groundcherry (*Physalis angulata*) can be used for dessert and beverages. Its root, stem, and leaves are occasionally used to make a beverage that has been used as medicine, and its fruit can be eaten raw.

Eleven different categories were created from the study's classification of the taste of wild exotic plants (Fig. 9). With eight species each, the most prevalent tastes among these were mild and bland (19%), slightly bitter (19%), and slightly sweet (19%). For example, *Anredera cordifolia* leaves are

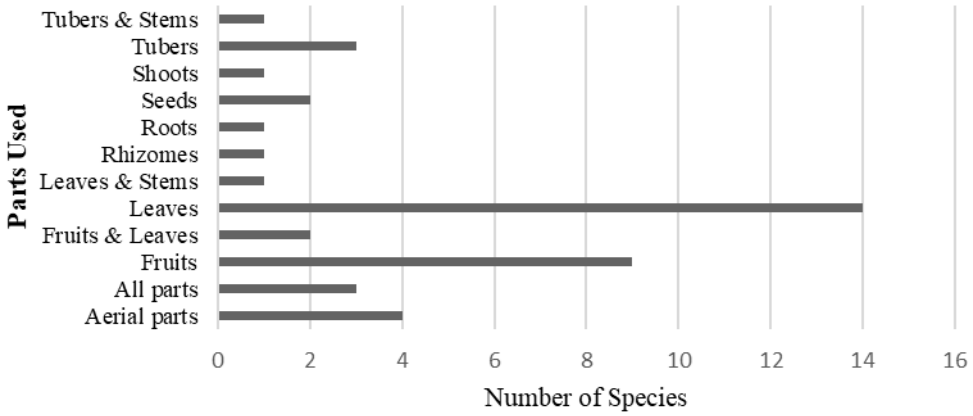

Fig. 7. Plant parts used across species.

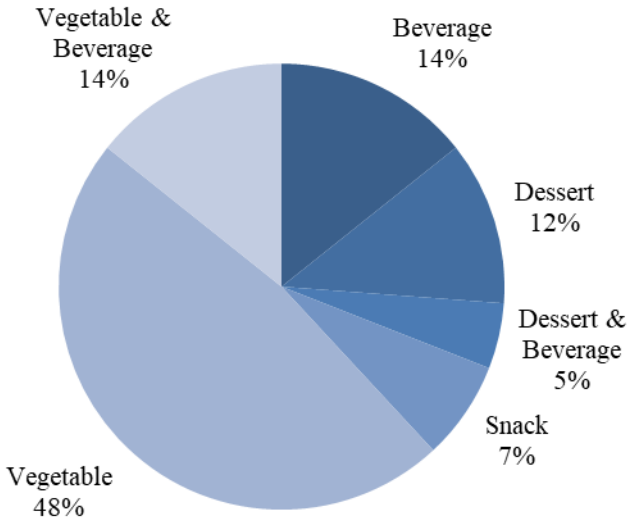

Fig. 8. Percentage of food types distribution.

classified as mild and bland, fireweed (*Crassocephalum crepidioides*) leaves are slightly bitter, and the fruits of American black nightshade (*Solanum americanum*) are slightly sweet (Figure 10).

Other important taste categories are slightly sour (17%), including woodsorrel (*Oxalis barrelieri*), whose aerial parts are eaten. Meanwhile, sweet and slightly sour categories include only three species (7%), including goldenberry (*Physalis peruviana*). Less common tastes were represented by individual species, such as slightly sweet and spicy, found in the young leaves of wild poinsettia (*Euphorbia heterophylla*). Bitter tastes are defined, for example, by the taste of broadleaf plantain (*Plantago major*), which can be both a vegetable and a beverage.

DISCUSSION

Species Composition and Life Forms

Asteraceae was the richest family recorded in this study. This family is known for its adaptability to a wide range of ecological conditions, including disturbed ecosystems (Roeble *et al.,* 2024). Many Asteraceae species are also widely used as food and medicine in many places (Petropoulos *et al.*, 2019; Rolnik & Olas, 2021). Solanaceae was the second most represented family, showing its culinary value due to its edible fruit (Samuels, 2015). In addition, the Solanaceae plants are rich in alkaloids, which have been traditionally used in various systems of medicine, especially as anti-inflammatory, antifungal, and antibacterial agents (Afroz *et al.,* 2020; Naseem *et al.*, 2023).

Beyond their nutritional and medicinal value, the prominence of Solanaceae in this study shows a broader pattern that is seen throughout Java, where this family consistently ranks among the most dominant in edible plant diversity and market systems (Iskandar *et al.*, 2021; 2023a; 2024; Nurshillah *et al.*, 2022; Fitriah & Mulyanto, 2025). This trend indicates that numerous Solanaceae species, including extensively cultivated exotic taxa, such as various chilies and potatoes, have been incorporated into local food systems. Their dominance may also be linked to practical factors, including ease of cultivation, short growth cycles, and high adaptability to anthropogenic landscapes.

Perennial herbs predominate among the documented species. Their persistence allows repeated harvesting possible and their well-developed root systems enable them to thrive in a wide range of environmental conditions. This year-round availability of resource may represent an adaptive strategy to ensure the stability of local food supplies (Medeiros *et al.*, 2021; Albuquerque *et al.*, 2015). The predominance of perennials also reflects their function as complementary food resources, especially in disturbed and anthropogenic ecosystems where many exotic species are established. While some of these plants may have been introduced for various purposes, their persistence in the landscape has enabled them to be included in local food practices as complementary foods. Annual herbs were also commonly observed. These types of herbs tend to be invasive plants with larger seeds and fine roots to optimize resource acquisition (Funk *et al.*, 2016; Poppenwimer *et al.*, 2023). Most herbs also have a short life span and a short life cycle, which allows them to accumulate highly bioactive chemicals and be highly useful for human needs (Albuquerque *et al.*, 2015).

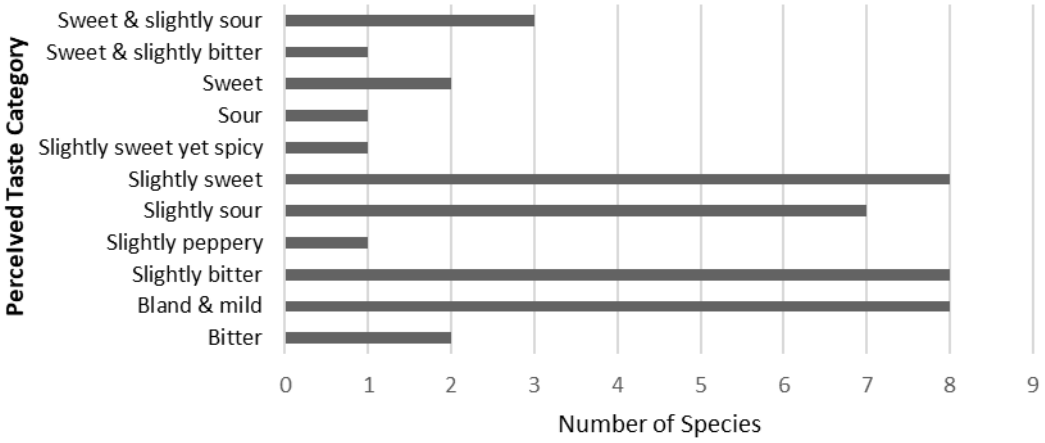

Fig. 9. Distribution of plant species by taste characteristics

Biogeographic Distribution and the Introduction of Exotic Plants

A large proportion of the documented species in this study originated from the Neotropical realm, indicating the strong historical impact of plant introductions from the American continent, ranging from southern Mexico and the Caribbean islands in the north to southeastern Brazil and the Andes in the south. These American species are likely neophytes, introduced after the Columbian Exchange as part of the global dissemination of crops and beneficial species during and following European colonial expansion (Preston *et al.*, 2004).

Other species may be archaeophytes introduced prior to European contact, potentially brought to Java during earlier cultural exchanges, such as Indianization and Austronesian migration, or through ancient trade networks, such as the Maritime Silk Road. For example, dandelion (*Taraxacum officinale*), a Eurasian species, is recognized for its pre-colonial presence in Java (Mulyanto *et al.*, 2024). Similarly, it is said that the Portuguese brought watercress (*Nasturtium officinale*) in the 16th century, a significant species native to several realms (Holarctic, Saharo-Arabian, African, Indo-Malesia) (van Steenis, 1972). This plant is known as *saladah* in Sundanese, perhaps from the Portuguese word *salada*. Another example is the castor bean (*Ricinus communis*), a species native to Africa and considered a notable archaeophyte, and most likely arrived in Java through ancient maritime trade routes (Xu *et al.*, 2021).

Of these finds, over 76% of the species in this study can be categorized as neophytes introduced after 1492, either intentionally (*e.g.,* useful, medicinal, forestry, or ornamental plants) or unintentionally as a result of human activity (*e.g.,* seeds in bird food). Most of these were Neotropic, Madrean, or Mediterranean plant species (Pols, 2009; Preston *et al.,* 2004). The high frequency of neophytes in the study area is probably related to the Columbian Exchange, as it is a buffer village of the oldest tea plantation in Java (Nunn & Qian, 2010). During the colonial period, the Dutch East Indies government established botanical gardens and introduced important crops, and colonists brought exotic plants to Java (Kudo *et al.*, 2014; Rahmawati & Rosleine, 2023).

A smaller proportion consists of archaeophytes or exotic plants with a longer history. Native to Holarctic, Indian, Indochinese, or African regions that were probably introduced before European colonization, during the Indianization and ancient Maritime Silk Road period, or even further back during the Austronesian migration (Aritonang *et al.,* 2024; Mulyanto *et al.,* 2023; Mulyanto *et al.,* 2024; Sujarwo *et al.,* 2016). Some archaeophytes are likely part of the local botanical knowledge in pre-colonial times, as evidenced by references to them in ancient literature (Mulyanto *et al.,* 2024).

Landscape Distribution and Foraging Behavior

Human activities, such as agriculture, tea plantations, and roadsides, affect the distribution of wild plants in anthropogenic landscapes. These environments often facilitate the spread of exotic species, many of which behave as invasive plant species that can disrupt native species and ecosystem functioning (González *et al.,* 2024). The availability of such environments also affects foraging behavior. Optimal foraging theory posits that foragers tend to prioritize resources that offer the greatest benefit relative to the effort required to collect them (Albuquerque *et al.,* 2015; Júnior *et al.,* 2015; Soldati *et al.,* 2017; Medeiros *et al.,* 2021). As a result, wild plants grow near settlements, farms, and plantation edges, and are harvested more often due to the reduced time and

Fig. 10. Bland to slightly flavoured plants (example only) A. *Maranta arundinacea*, B. *Crassocephalum crepidioides,* C. *Solanum americanum*, D. *Oxalis barrelieri*, E. *Physalis angulata*, F. *Euphorbia heterophylla.*

effort required for collection. Therefore, this pattern also corresponds with the concept of convenience, a pragmatic factor that includes not only proximity but also the simplicity of collecting, processing, and integrating plants into everyday meals (Nobayashi, 2022). Despite environmental changes, such as the conversion of forests to coffee agroforestry, women continue to forage near their settlements. This preference indicates that practical factors include protection from wild animals, time constraints owing to domestic obligations, and the accessibility of plant resources in convenient areas.

Social Background and Gender Roles in Wild Plants Knowledge

Informants' interaction with wild plants is shaped by their social background. The majority of this study's informants were tea plantation workers, while many elderly informants were retired plantation workers who now work on coffee plantations and farms and raise livestock. These livelihood activities maintain continuous interaction with surrounding environments such as plantations, agricultural land, and forest margins, creating opportunities to encounter and learn about wild plants.

Knowledge of wild plants is primarily transmitted within families, particularly from mothers. Many informants reported that they had accompanied their mothers to work on a plantation or farm, where they saw wild plants gathered for the midday meal. Informants sometimes see their colleagues gather edible wild plants they encounter on their way home and bring them home to prepare and feed to their family. These patterns show both vertical knowledge transmission within families and horizontal learning through interaction with neighbors and coworkers (Alqethami *et al.,* 2017; Mantuan & Sannomiya, 2024).

Livelihood practice also influences the distribution of botanical knowledge. Coffee plantations in the region are typically managed using agroforestry systems, allowing workers to interact with a semi-forested ecosystem rich in wild species. While both genders engage in these activities, their roles are distinct. Men are more inclined to venture into deeper forest regions for activities such as gathering firewood and maintaining water pipes, which may increase their knowledge of forest species. Women frequently gather wild plants near tea plantations, farms, or residences and typically have extensive knowledge of edible species and their preparation techniques. This dynamic illustrates a broader trend, women generally exhibit wider knowledge of species used especially for home care (*e.g.*, edible, medicinal, ornamental), whilst men are more knowledgeable about plants utilized for timber and fiber (Rangel-Landa *et al.,* 2017; Acosta-Naranjo *et al.,* 2021; Costa *et al.,* 2021; Novriyanti *et al.,* 2021; Tng *et al.,* 2021; Shrestha *et al.,* 2024).

Gender roles also affect how tools are used. In Sundanese agricultural society, the traditional machete (*bedog*) is typically linked to men and symbolizes masculinity (Primaditya, 2008). Men often use such tools for labor-intensive tasks, such as weeding. Conversely, in occupations requiring ac-

curacy and manual dexterity, women are often seen as having an advantage, such as on tea plantations, where they are often assigned as pickers. Meanwhile, in collecting wild plants, women use their ability to collect leaves and soft fruits, which require careful picking to avoid damaging the harvest. Women are less likely to utilize tools when collecting wild plants because these activities are usually carried out in easily accessible locations close to their houses (da Costa *et al.,* 2021; Acosta-Naranjo *et al.,* 2021; Mulyoutami *et al.,* 2015). Women are often responsible for more household duties, such as managing home gardens and nearby land. These locations are typically rich in exotic plants (Tng *et al.,* 2021), most of which are herbs and are usually collected by women without specialized tools (Fatimah & Mulyanto, 2025).

Alongside familial transmission, self-experience is also a source of knowledge. Foragers who raise cattle travel daily to farmlands, forest edges, and the uncultivated areas to search for fodder. They usually know a species is edible when their cattle would eat it.

Lalapan and Sundanese Culinary Identity

Sundanese cuisine emphasizes vegetables, with *lalapan* serving as an important component. *Lalapan* refers to fresh or blanched leafy greens, sourced from both cultivated and wild plants (Hernawati *et al.,* 2022; Septiani *et al.,* 2020; Suwartapradja *et al.,* 2023; Iskandar *et al.,* 2018; Iskandar, 2018). It is commonly paired with *sambal* (Soemarwoto & Iskandar, 2021), a chili-based sauce made with a mixture of chilies, garlic, shallots, sugar, and salt. With its many variations, including *sambal terasi* and *sambal héjo*, *sambal* not only enhances *lalapan* but also strengthens the Sundanese culinary identity. The high demand for *lalapan* highlights its significance in Sundanese households (Iskandar *et al.,* 2023b; Iskandar *et al.,* 2024; Iskandar *et al.,* 2018), as it is typically consumed with rice and side dishes at every mealtime (Amrinanto *et al.,* 2019; Septiani *et al.,* 2020). Readily available in both semi-modern and traditional markets, *lalapan* is also a staple offering in food stalls and Sundanese restaurants, further cementing its role in daily cuisine (Amalia & Marta, 2018; Kodir & Moektiwardoyo, 2022; Mulyanto *et al.,* 2018; Fitriah & Mulyanto, 2025).

As seen in Fig. 9, there is no clear preference for a dominant taste. However, in Sundanese culture, bitterness appears to be particularly significant. Many vegetables, both wild and cultivated, are known for their bitter taste, including bitter gourd, stinky bean, dogfruit, and papaya leaves. These bitter cuisines are often considered “adult foods” and are typically eaten by adults and the elderly (Hernawati *et al.,* 2022). This taste preference for bitter food is influenced by societal and cultural variables in addition to personal preference. For instance, Eurasian black nightshade (*Solanum nigrum*), which has a slightly bitter taste, is often introduced to children during family meals, where they observe and gradually come to enjoy it by imitating older family members (Mulyanto *et al.,* 2018). However, in many studies, children are more sensitive to bitterness than adults, which contributes to their early reluctance to consume bitter vegetables. The underlying genetic and environmental factors, such as an innate evolutionary preference for sweet foods, heritable genotype markers, bitter-taste endophenotypes, and parental feeding practices, food availability, accessibility, and exposure, may be the cause of their preference for discretionary foods (Mennella & Bobowski, 2015; Yang *et al.,* 2024).

CONCLUSION

The introduction of exotic plant species has become an inevitable phenomenon in the context of globalization. This study describes local knowledge of exotic wild plants used as complementary food in a buffer area of a historic West Java tea estate. Forty-two edible exotic species were found, mainly herbaceous species. Most of these species are neophytes, introduced during or after European colonization. The occurrence of many naturalized plant species in the study area is likely attributable to historical plantation activities, part of the Columbian Exchange, which introduced these species to Java, either deliberately or accidentally. These plants are primarily located around the hamlet, with leaves being the most frequently utilized part, particularly for *lalapan*, an essential element of Sundanese culinary culture. The community prioritizes readily available resources that require the least effort, consistent with optimal foraging theory. Gender roles also have a significant effect, where women typically gather plants in villages, whilst men tend to go farther into the forest. The selective use of edible yet invasive exotic species can reduce their adverse effects and support the conservation of native and endemic plant species. Moreover, these practices may be incorporated into ecotourism initiatives such as wild edible plant walking tours and culinary experiences. The integration of exotic wild plants into local practices indicates processes of cultural continuity, ecological resilience, and socioeconomic opportunities.

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REFERENCES

ACOSTA-NARANJO, R., RODRIQUEZ-FRANCO, R., GUZMAN-TRONCOSO, A. J., PARDO-DE-SANTANAYA, M., ACEITUNO-MATA, L., GOMEZ-MELARA, L., DOMINGUEZ, P., DIAZ-REVIRIEGO, I., GONZALEZ-NATERAS, J. & REYES-GARCIA, P. 2021. Gender differences in knowledge, use, and collection of wild edible plants in three Spanish areas. *Sustainability* 13: Art. 2639. DOI: 10.3390/su13052639.

AFROZ, M., AKTER, S., AHMED, A., ROUF, R., SHILPI, J. A., TIRALONGO, E., SARKER, S. D., GÖRANSSON, U. & UDDIN, S. J. 2020. Ethnobotany and antimicrobial peptides from plants of the Solanaceae family: An update and future prospects. *Frontiers in Pharmacology* 11: Art. 565. DOI: 10.3389/fphar.2020.00565.

ALBUQUERQUE, U. P., RAMOS, M. A., JÚNIOR, W. S. F. & DE MEDEIROS, P. M. 2017. *Ethnobotany for Beginners*. Springer, Cham. DOI: 10.1007/ 978-3-319-52872-4.

ALBUQUERQUE, U. P. DE., SOLDATI, G. T., RAMOS, M. A., MELO, J. G. DE, MEDEIROS, P., NASCIMENTO, A. & JUNIOR, W. S. F. 2015. The influence of the environment on natural resource use: Evidence of apparency. In: De ALBUQUERQUE, U. P., DE MEDEIROS, P. M. & CASAS, A. (Eds.). *Evolutionary Ethnobiology*. Springer, Cham. Pp. 131-147. DOI:10.1007/978-3-319-19917-7.

ALQETHAMI, A., HAWKINS, J. A. & TEIXIDOR-TONEU, I. 2017. Medicinal plants used by women in Mecca: urban, Muslim and gendered knowledge. *Journal of Ethnobiology and Ethnomedicine* 13(1): 1–24. DOI: 10.11 86/ s130-02-017-0193-4.

AMALIA, R. M. & MARTA, D. C. F. 2018. Preserving traditional food from West Java: an effort to maintain national and regional food security. *International Journal on Studies in English Language and Literature* 6(9):1–7. DOI: 10.20431/2347-3134.0609001.

AMRINANTO, A. H., HARDINSYAH, H. & PALUPI, E. 2019. The eating culture of the Sundanese: does the traditional salad (Lalapan) Improve Vegetable Intake and blood β-carotene concentration? *Future of Food: Journal on Food, Agriculture and Society* 7(2): 1–10. DOI: 10.17170/kobra-20190709593.

ARAÚJO, E. D. L. & FERRAZ, E. M. N. 2014. Analysis of vegetation in ethnobotanical studies. In: ALBUQUERQUE, U. P., da CUNHA, L. V. F. C., de LUCENA, R. F. P. & ALVES, R. R. N. (Eds.). *Methods and Techniques in Ethnobiology and Ethnoecology*. Springer, New York, Heidelberg, Dordrecht, London. Pp. 141–159. DOI: 10.10 07/978-1-461 4-8636-7.

ARITONANG, Y. A. C., LUBIS, M. F. & SUJARWO, W. 2024. Ethnopharmacology of Karo Oil as traditional medicine by Karo ethnic group in Berastagi (North Sumatra), Indonesia. *Ethnobotany Research and Applications* 27: Art. 17. 1–43. DOI: 10.32 859/ era.27.17.1-43.

AULIA, S. A. Z. & MULYANTO, D. 2024. Gathering edible wild plants in a mountain village of West Java, Indonesia: Diversity of species, utilizations, and Local perceptions. *Journal of Tropical Ethnobiology* 7(2): 79–101. DOI: 10.46359/jte.v7i2.185.

AULIA, S. A. Z., MULYANTO, D., ISKANDAR, B. S., MAN, Z. & SUJARWO, W. 2025. Continuity and change in Sundanese use of wild vegetables: A historical ethnobotany analysis. *Ethnobotany Research and Applications* 32: Art. 29. DOI: 10.32859/ era.32.29.1-16.

BACKER, C. A. & VAN DEN BRINK, Jr. R. C. B. 1968. *Flora of Java (Spermatophytes Only)*. Wolters-Noordhoff, Groningen.

BACKER, C. A. 1928. Verwilderingscentra op-Java van uitheemsche planten. *De Tropische Natuur 1 (Jubileumnummer)*: 51–60.

COSTA, F. V. D., GUIMARÃES, M. F. M. & MESSIAS, M. C. T. B. 2021. Gender differences in traditional knowledge of useful plants in a Brazilian community. *PLoS ONE* 16(7): Art. e0253820. DOI: 10.1371/ journal.pone.0253820.

FARIKHA, K. N., SYAHRANI, L. P. W., ALFIYAH, L. K., LUTHFIA, L., NURWULANDARI, M., NAZAR, I. A., JUNAEDI, E. & SETYAWAN, A. D. 2024. The diversity of wild edible plants used by community living around Mount Merapi National Park, Central Java, Indonesia. *Biodiversitas* 25(9): 3041–3049. DOI: 10. 13057/ biodiv/d250925.

FATIMAH, F. Z. N. & MULYANTO, D. 2025. Wild plant knowledge and local disaster mitigation in West Java's deforested highland, Indonesia. *Asian Journal of Forestry* 9(2): 418–427. DOI: 10.13057/asianjfor/r090222.

FITRIAH, L. & MULYANTO, D. 2025. Plants sold in traditional marketplace in West Java highland: An ethnobotanical analysis. *Al-Hayat* 8(2): 133–154. DOI: 10.21580/ah.v8i 2.28426.

FUNK, J. L., STANDISH, R. J., STOCK, W. D. & VALLADARES, F. 2016. Plant functional traits of dominant native and invasive spe-

cies in Mediterranean-climate ecosystems. *Ecology* 97(1): 75–83. DOI: 10.1890/15-0974.1.

GAMA, A. D. S., DE PAULA, M., DA SILVA, R. R. V., FERREIRA, W. S. & MEDEIROS, P. M. D. 2018. Exotic species as models to understand biocultural adaptation: Challenges to mainstream views of human-nature relations. *PLOS ONE* 13(4): e0196091. DOI: 10.1371/journal.pone.0196091.

GONZÁLEZ, M. V., MONTTI, L., JIMENEZ, Y. G. & ARÁOZ, E. 2024. Linking migration flows with the prevalence of exotic plant species in the Andes. *Mountain Research and Development* 44(1): R1–R9. DOI: 10.1659/mrd.2023.00017.

GRAS, A., SERRASOLSES, G., VALLES, J. & GARNATJE, T. 2019. Traditional knowledge in semi-rural close to industrial areas: ethnobotanical studies in Western Girones (Catalonia, Iberian Peninsula). *Journal of Ethnobiology and Ethnomedicine* 15: Art. 19. DOI: 10.1186/s13002-019-0295-2.

HANDAYANI, A. & HIDAYATI, S. 2020. Utilization of Invasive Alien Species (IAS) by communities around Cibodas Biosphere Reserve (CBR): A recommendation for Invasive Alien Species management and policy. In *IOP Conference Series: Earth and Environmental Science* 533: Art. 012017. DOI: 10.1088/1755-1315/533/1/012017.

HANDAYANI, A., ZUHUD, E. A. M. & JUNAEDI, D. I. 2021. Assessing the utilization of naturalized alien species by community to inform its management strategy: A case study in Cibodas Biosphere Reserve, West Java, Indonesia. *Biodiversitas* 22(7): 2579–2588. DOI: 10.13057/biodiv/d220705.

HERNAWATI, D., PUTRA, R. R. & MEYLANI, V. 2022. Indigenous vegetables consumed as Lalapan by a Sundanese ethnic group in West Java, Indonesia: Potential, traditions, local knowledge, and it's future. *South African Journal of Botany* 151: 133–145. DOI: 10.1016/j.sajb.2022.09.007.

HURRELL, J. A. 2016. Ornamental Plants. In: ALBUQUERQUE, U. P. & ALVEZ, R. R. N. (Eds.). *Introduction to Ethnobiology*. Springer International Publishing. Pp. 171–176. DOI: 10. 1007/978-3-319-28155-1.

ISKANDAR, B. S., IRAWAN, B., MULYANTO, D., ISKANDAR, J., ALFINANDA, A. & RAJAB, B. 2023a. Gastronomic ethnobotany of traditional vegetables among the Sundanese in rural West Java, Indonesia. *Biodiversitas Journal of Biological Diversity* 24 (7): 3932–3950. DOI: 10.13057/biodiv/d240732.

ISKANDAR, B. S., ISKANDAR, J., MULYANTO, D., ALFIAN, R. L. & SUROSO, S. 2021. Traditional market, social relations, and diversity of edible plants traded in Beringharjo Market, Yogyakarta, Indonesia. *Biodiversitas* 22(4): 2045–2057. DOI: 10.13057/biodiv/d220453.

ISKANDAR, B. S., ISKANDAR, J., MULYANTO, D., & ALIIFAH, F. 2023b. Local knowledge of the Sundanese community on traditional foods to enhance the family food security. *Etnosia* 8(1): 76–89. DOI: 10.31947/etnosia.v8i1.24461.

ISKANDAR, B. S., MULYANTO, D., ISKANDAR, J. & YUSTIADI, T. 2024. Ethnobotanical knowledge on vegetable plants among traders in Ujungberung Market, Bandung, West Java. *Media Konservasi* 28(3): 296–304. DOI: 10.29244/medkon.28.3.296-304.

ISKANDAR, J., ISKANDAR, B. S. & 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): 565–577. DOI: 10.13057/biodiv/d190227.

JUNAEDI, D. I., PUTRI, D. M. & KURNIAWAN, V. 2021. Assessing the invasion risk of botanical garden's exotic threatened collections to adjacent mountain forest: A case study of Cibodas Botanical Garden. *Journal of Mountain Science* 18: 1847–1855. DOI: 10.1007/s11629-020-6550-0.

JÚNIOR, W. S. F., CAMPOS, L. Z. D. O., PIERONI, A. & ALBUQUERQUE, U. P. 2015. Biological and cultural bases of the use of medicinal and food plants. In: ALBUQUERQUE, U. P., de MEDEIROS, P. M. & CASAS, A. (Eds.). Evolutionary Ethnobiology. Springer, Cham. Pp. 175–184. DOI: 10.1007/978-3-319-19917-7_13.

KODIR, R. A. & MOEKTIWARDOYO, M. 2022. Health benefits of three wild leafy vegetables in 'Lalapan' as Sundanese traditional and ethnic foods. *Indonesian Journal of Biological Pharmacy* 2(1): 37–43. DOI: 10.24198/ijbp.v2i1.38414.

KUDO, Y., MUTAQIEN, Z., SIMBOLON, H. & SUZUKI, E. 2014. Spread of invasive plants along trails in two national parks in West Java, Indonesia. *Tropics* 23(3): 99–110. DOI: 10.3759/tropics.23.99

KULSUM, N. N. S. & SUSANDARINI, R. 2023. Diversity of wild edible fruits in the Agroforestry area of Cigalontang village, Tasikmalaya, Indonesia. *Biodiversitas* 24(7): 4161–4167. DOI: 10.13057/biodiv/d240755.

LAUTENSCHLÄGER, T., MONIZI, M., PEDRO, M., MANDOMBE, J. L., BRANQUIMA, M. F. & NEINHUIS, C. 2018. First large-scale ethnobotanical survey in the Province of Uige, Northern Angola. *Journal of Ethnobiology and Ethnomedicine* 14: Art. 51. DOI: 10.1186/s13002-018-0238-3.

ŁUCZAJ, L., JUG-DUJAKOVIC, M., DOLINA, K., JERICEVIC, M. & VITASOVIC-KOSIC, I. 2024. Ethnobotany of the ritual plants of the Adriatic Islands (Croatia) associated with the Roman-Catholic ceremonial year. *Acta Societatis Botanicorum* 93: Art. 180804. DOI: 10.5586/asbp/180804.

MANTUAN, V. & SANNOMIYA, M. 2024. Women and medicinal plants: A systematic review in the field of ethnobotany. *Acta Scientiarum. Biological Science* 46: Art. e70700. DOI: 10.4025/actascibiolsci.v46i1.70700.

MEDEIROS, P. M. D., FIGUEIREDO, K. F., GONÇALVES, P. H. S., CAETANO, R. D. A., SANTOS E. M. D. C., DOS SANTOS, G. M. C., BARBOSA, D. M., DE PAULA, M. & MAPELI, A. M. 2021. Wild plants and the food-medicine continuum—an ethnobotanical survey in Chapada Diamantina (Northeastern Brazil). *Journal of Ethnobiology and Ethnomedicine* 17(1): Art. 37. DOI: 10. 1186/s13002-021-00463-y.

MENNELLA, J. A. & BOBOWSKI, N. K. 2015. The sweetness and bitterness of childhood: insights from basic research on taste preferences. *Physiology & Behavior* 152: 502–507. DOI: 10.1016/j.physbeh.2015.05.015.

NURSHILLAH, C., ANGGOROWATI, D., PUTRI, E. R., BALGIS, M., NURWULANDARI, M., MURTININGSIH, M., AGUSTINA, N., WULANDARI, P., LIZA, N., HIMAWAN, W. & SETYAWAN, A. D. 2022. Diversity of edible plants traded in Legi Traditional Market, Surakarta, Indonesia. *Asian Journal of Ethnobiology* 5(1): 52–61. DOI: 10.13057/asianjethnobiol/y050106

MOTTI, R. & MOTTI, P. 2017. An ethnobotanical survey of useful plants in the Agro Nocerino Sarnese (Campania, Southern Italy). *Human Ecology* 45(1): 865–878. DOI: 10.1007/s1074 5-017-9946-x.

MOTTI, R. 2022. Wild edible plants: a challenge for future diet and health. *Plants* 11(3): 10–12. DOI: 10.3390/plants11030344.

MULYANTO, D., ISKANDAR, J., ABDOELLAH, O. S., ISKANDAR, B. S., RIAWANTI, S. & PARTASASMITA, R. 2018. Leunca (*Solanum americanum* Mill.): The uses as vegetable in two villages in upper Citarum Area, Bandung, West Java, Indonesia. *Biodiversitas* 19(5): 1941–1954. DOI: 10.13057/biodiv/d190546.

MULYANTO, D., ISKANDAR, B. S., ISKANDAR, J. & WIYANTI, D. T. 2024. Flora of ancient Java: Identification of species, landscape distribution, and cultural association of plants mentioned in Old Javanese Ramayana. *Reinwardtia* 23(2): 83–101. DOI: 10.55981/reinwardtia.2024.4821.

MULYANTO, D., ISKANDAR, B. S., ISKANDAR, J., INDRAWARDANA, I. & AUFA, A. A. 2023. Ethnobotanical analysis of phytonyms and plant-related glosses mentioned in Bujangga Manik, a Pre-Islamic Sundanese text (15th Century Java, Indonesia). *Reinwardtia* 22(2): 131–143. DOI: 10.55981/reinwardtia.2023/4608.

MULYOUTAMI, E., ROSHETKO, J. M., MARTINI, M., AWALINA, D. & JANUDIANTO, J. 2015. Gender roles and knowledge in plant species selection and domestication: A case study in South and Southeast Sulawesi. *International Forestry Review* 17(4): 99–111. DOI: 10.1505/14655 4815816086453.

NASEEM, A., LIU, Y., NAZLI, A., KUANG, H. X. & YANG, B. Y. 2023. An insight into indigenous ethnobotanical and pharmacological potential of Solanaceae family in Pakistan: A Review. *Journal of Herbal Medicine* 42: Art. 100763. DOI: 10.1016/j.hermed.2023.100763.

NOBAYASHI, A. 2022. Introduction: making food in the cultural and civilized contexts. In: NOBAYASHI, A. (Ed.). *Making Food in Local and Global Contexts: Anthropological Perspectives*. Springer Nature, Singapore. Pp. 1–12.

NOVRIYANTI, N., NURSANTI, N. & WULAN, C. 2021. Short communication: Do women have a piece of traditional knowledge on medicinal plants? A case study around Jambi Urban Forest, Indonesia. *Asian Journal of Ethnobiology* 4(2): 115–119. DOI: 10.13057/asianjethnobiol/y040206.

NUNN, N. & QIAN, N. 2010. The Columbian exchange: A history of disease, food, and ideas. *Journal of Economic Perspectives* 24 (2): 163–188. DOI: 10.1257/jep.24.2.163.

PADMANABA, M., TOMLINSON, K. W., HUGHES, A. C. & CORLETT, R. T. 2017. Alien plant invasions of protected areas in Java, Indonesia. *Scientific Reports* 7: Art. 9334. DOI: 10.1038/s41598-017-09768-z.

PETROPOULOS, S. A., FERNANDES, Â., TZORTZAKIS, N., SOKOVIC, M., CIRIC, A., BARROS, L. & FERREIRA, I. C. F. R. 2019. Bioactive compounds content and antimicrobial activities of wild edible Asteraceae species of the Mediterranean flora under commercial cultivation conditions. *Food Research International* 119: 859–868. DOI: 10.1016/j.foodres.2018.10.069.

POLS, H. 2009. European physicians and botanists, indigenous herbal medicine in the Dutch East Indies, and colonial networks of mediation. *East Asia Science, Technology and Society: An International Journal* 3: 173–208. DOI: 10.1215/s12280-009-9085-6.

POPPENWIMER, T., MAYROSE, I. & DEMALACH, N. 2023. Revising the global biogeography of annual and perennial plants. *Nature* 624: 109–114. DOI: 10.1038/s41586-023-06644-x.

POWO. 2024. Plants of the World Online. Facilitated by the Royal Botanic Gardens, Kew. Published on the Internet. https://powo.science.kew.org/ (Accessed 14 June 2025).

PRATAMA, M. F., DWIARTAMA, A., ROSLEINE, D., ABDULHARIS, R. & IRSYAM, A. S. D. 2019. Documentation of Underutilized Fruit Trees (UFTs) across indigenous communities in West Java, Indonesia. *Biodiversitas* 20(9): 2603–2611. DOI: 10.13057/biodiv/d200924.

PRESTON, C. D., PEARMAN, D. A. & HALL, A. R. 2004. Archaeophytes in Britain. *Botanical Journal of the Linnean Society* 145 (3): 257–294. DOI: 10.1111/j.1095-8339.2004.00284.x.

PRIMADITYA. 2008. *Desain Golok Sunda Ciwidey*. Institut Teknologi Bandung, Bandung. (MSc. Thesis).

RAHAYU, Y. Y. S., SUJARWO, W., IRSYAM, A. S. D., DWIARTAMA, A. & ROSLEINE, D. 2024. Exploring unconventional food plants used by local communities in a rural area of West Java, Indonesia: Ethnobotanical assessment, use trends, and potential for improved nutrition. *Journal of Ethnobiology and Ethnomedicine* 20: Art. 68. DOI: 10.1186/s13002-024-00710-y.

RAHMAWATI & ROSLEINE, D. 2023. Spatial distribution of invasive plants in Bandung, West Java, Indonesia. *Biotropia* 30(2): 171–182. DOI: 10.11598/btb.2023.30.2.1780.

RANGEL-LANDA, S., CASAS, A., GARCÍA-FRAPOLLI, E. & LIRA, R. 2017. Sociocultural and ecological factors influencing management of edible and non-edible plants: The case of Ixcatlán, Mexico. *Journal of Ethnobiology and Ethnomedicine* 13: Art. 59. DOI: 10.1186/s13002-017-0185-4.

ROEBLE, L., VAN BENTHEM, K. J., WEIGELT, P., KREFT, H., KNOPE, M. L., MANDEL, J. R., VARGAS, P., ETIENNE, R. S. & VALENTE, L. 2024. Island biogeography of the megadiverse plant family Asteraceae. *Nature Communications* 15(1): Art. 7276. DOI: 10.1038/s41467-024-51556-7.

ROLNIK, A. & OLAS, B. 2021. The plants of the Asteraceae family as agents in the protection of human health. *International Journal of Molecular Sciences* 22(6): Art. 3009. DOI: 10.3390/ijms22063009.

SAMUELS, J. 2015. Biodiversity of food species of the Solanaceae family: A preliminary taxonomic inventory of subfamily Solanoideae. *Resources* 4(2): 277–322. DOI: 10.3390/resources4020277.

SEPTIANI, N., HERNAWATI, D. & PUTRA, R. R. 2020. Biodiversity of potentially 'Lalapan' vegetables in Kampung Adat Naga, Tasikmalaya, Indonesia. *Biosfer* 13(2): 201–215. DOI: 10.21009/biosferjpb.v13n2.201-215.

SHRESTHA, S., BORGERSON, C. & RASOLOFONIAINA, B. J. R. 2024. Gender roles in natural resource use in Madagascar. *Ecosystems and People* 20(1): Art. 2344850. DOI: 10.1080/26395916.2024.2344850.

SILVA, P. H., JÚNIOR, W. S. F., ZANK, S., DO NASCIMENTO, A. L. B. & DE ABREU, M. C. 2024. The influence of exotic and native plants on illnesses with physical and spiritual causes in the semiarid region of Piauí, Northeast of Brazil. *Journal of Ethnobiology and Ethnomedicine* 20(1): Art. 24. DOI: 10.1186/s13002-024-00667-y.

SOEMARWOTO, R. S. & ISKANDAR, J. 2021. Plant knowledge richness in the Sundanese upland village: A case study in Sindangsari, West Java, Indonesia. *Biodiversitas* 22(9): 3722–3735. DOI: 10.13057/biodiv/d220916.

SOLDATI, G. T., DE MEDEIROS, P. M., DUQUE-BRASIL, R., COELHO, F. M. G. & ALBUQUERQUE, U. P. 2017. How do people select plants for use? Matching the ecological apparency hypothesis with optimal foraging theory. *Environment, Development and Sustainability* 19: 2143–2161. DOI: 10.1007/s10668-016-9844-1.

SRIWAHJUNINGSIH & PUTRI, D. I. 2022. Wild edible plants: SDGs strategy in the Kamojang crater forest support area. *Journal of Tropical Ethnobiology* 5(2): 79–93. DOI: 10.463 59/jte.v5i2.155.

STEENIS, C. G. G. J. van. 1972. *The Mountain Flora of Java*. E. J. Brill, Leiden.

SUJARWO, W., ARINASA, I. B. K., CANEVA, G. & GUARRERA, P. M. 2016. Traditional knowledge of wild and semi-wild edible plants used in Bali (Indonesia) to maintain biological and cultural diversity. *Plant Biosystems* 150(5): 971–976. DOI: 10.1080/11263504.2014.994577.

SUWARTAPRADJA, O. S., ISKANDAR, J., ISKANDAR, B. S., MULYANTO, D., SUROSO, NURJAMAN, D. & NISYAPURI, F. F. 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.

TARDÍO, J. & PARDO-DE-SANTAYANA, M. 2008. Cultural importance indices: A comparative analysis based on the useful wild plants of Southern Cantabria (Northern Spain). *Economic Botany* 62(1): 24–39. DOI: 10.1007/s12231-007-9004-5.

TNG, D. Y. P., APAGUA, D. M. G., LISBOA, M. D. S. & EL-HANI, C. N. 2021. Gender differences in plant use knowledge within a tra-

ditional fishing community in northeastern Brazil. *Ethnobotany Research and Applications* 21: Art. 12. DOI: 10.32859/era.21.12.1-36.

TOLEDO, V. M. 2002. Ethnoecology: A conceptual framework for the study of indigenous knowledge of nature. In: STEPP, J. R., WYNDHAM, F. S. & ZARGER, R. K. (Eds.). *Ethnobiology and Biocultural Diversity.* International Society of Ethnobiology, Athens. Pp. 511–522.

TRIYANTO, A., PURNAMASARI, F., PARAMITA, F. S., WICAKSONO, F. R., RAMADHAN, F. A., BUDIHARTA, S., SAENSOUK, S. & SETYAWAN, A. D. 2024. Ethnobotany of wild edible plants used by local communities in three districts along the upper Bengawan Solo River, Central Java, Indonesia. *Biodiversitas* 25(4): 1596–1605. DOI: 10.13057/biodiv/d250428.

VOEKS, R. 2013. Ethnobotany of Brazil's African diaspora: The role of floristic homogenization. In: VOEKS, R. & RASHFORD, J. (Eds.). *African Ethnobotany in the Americas*. Springer, New York. Pp. 395–416. DOI: 10.1007/978-1-4614-0836-9.

XU, W., WU, D., YANG, T., SUN, C., WANG, Z., HAN, B., WU, S., YU, A., CHAPMAN, M. A., MURAGURI, S., TAN, Q., WANG, W., BAO, Z., LIU, A. & LI, D. Z. 2021. Genomic insights into the origin, domestication and genetic basis of agronomic traits of castor bean. *Genome Biology* 22: Art. 113. DOI: 10.1186/s13059-021-02333-y.

YANG, W. Y., LIM, K. Y., YEN, P. L., ONG, S. H., NAUMOVSKI, N. & JANI, R. 2024. The association between consumption of bitter-taste vegetables in Asian culture and metabolic syndrome risk factors in children: A narrative review. *Exploratory Research and Hypothesis in Medicine* 9(1): 52–59. DOI: 10.14218/ERHM.2022.00129.

YANTY, D., HERNAWATI, D. & PUTRA, R. R. 2024. Study of bamboo ethnobotany by the local community residing around Mount Galunggung in Tasikmalaya Regency. *Journal of Tropical Ethnobiology* 7(2): 50–60. DOI: 10.46359/jte.v7i2.181.