BIODIVERSITAS
Volume 24, Number 12, December 2023
Pages: 6953-6968

ISSN: 1412-033X
E-ISSN: 2085-4722
DOI: 10.13057/biodiv/d241257

Diversity of edible plants traded in the East Jakarta traditional markets, Indonesia

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Manuscript received: 17 August 2023. Revision accepted: 31 December 2023.

Abstract. *Afrianto WF, Hasanah LN, Metananda AA. 2023. Diversity of edible plants traded in the East Jakarta traditional markets, Indonesia. Biodiversitas 24: 6953-6968.* Traditional markets provide limited assistance while facilitating transient or set-term direct retail interactions between buyers and sellers. Commodities traded in the traditional markets range from fresh produce, pantry, dairy, snacks, meat, fish, and wellness products. This study aimed to determine the ethnobotany of edible plant species in Indonesia's East Jakarta traditional markets. This study used an ethnobotanical approach qualitatively. The data were collected using purposive sampling, which included 157 sellers. This study found that 140 edible plant species (181 landraces) in the East Jakarta traditional markets belong to 50 plant families. Most plants were fruits (102 species), with herbs as the most dominant life form (90 species). Most edible plants must be cooked before consumption (40%) as vegetables (68 species). In addition, 166 species are cultivated, 8 are semi-cultivated, and 7 are wild-type plants. The edible plants observed in the traditional markets in this study are classified as highly available (79%) and can be found in all seasons (91%). The East Jakarta traditional markets have an essential role as a place of economic botany that can help balance the economy and conservation efforts. Consequently, traditional markets recreate an essential social-cultural function by combining cultural and biological diversity on a small scale.

Keywords: Diversity, East Jakarta, edible plants, ethnobotany, traditional markets

INTRODUCTION

Traditional markets facilitate direct retail activities between sellers and buyers in a temporary or fixed time with a limited level of service. They usually arise from the needs of the communities to sell their produce, while consumers can obtain their daily needs in the market (Vlkova et al. 2015). In contrast to modern markets with fixed prices, in traditional markets, product bargaining occurs during trade interactions (Iskandar et al. 2018). Traditional markets, characterized by direct retail interactions, emerge from community needs to buy and sell produce. Despite the dominance of modern markets in Indonesia, traditional markets maintain a distinct role (Deanova et al. 2021; Iskandar et al. 2021). These markets foster symbiotic relationships, intertwining the roles of sellers, the physical marketplace, and livelihoods (Aliyah et al. 2017). Social bonds, influenced by norms and beliefs, deepen during interactions, creating connections beyond mere transactions (Andriani and Ali 2013).

At the same time, plants serve as essential components for human nourishment and are diversely traded in traditional markets. Local produce still prevails and offers fresher, less expensive items than modern markets (Franco et al. 2020). Traditional markets preserve Traditional Ecological Knowledge (TEK) (Silalahi et al. 2015). Passed down through generations, TEK encompasses cultural values associated with traded plant resources (Meke et al. 2017). In addition to cultivated products, traditional markets feature wild plants obtained from forests or local agroforestry, often serving ceremonial, cultural, or decorative purposes (Doğan et al. 2013; Manzanero-Medina et al. 2020; Iskandar et al. 2022).

In general, the traditional marketplaces trade in various edible plants as staple foods and traditional medicines (Silalahi et al. 2015; Franco et al. 2020; Uzun and Koca 2020; Iskandar et al. 2021; Nurshillah et al. 2022; Asra et al. 2023). Plants sold in traditional markets are typically cultivated and wild plant species (Hilonga et al. 2019: Zhang et al. 2020). For instance, traditional West Java markets offer a diverse ethnobotanical view on using plants and a heightened diversity of edible plants, including staple carbohydrate foods, vegetables, fruit, and spices (Iskandar et al. 2018). Traditional market sellers have also been reported selling wild plants, which have helped increase their income and become a significant alternative source of income for local farmers. Many parts of the plants are offered, such as fruits, leaves, seeds, tuberous roots, rhizomes, caliginous tubers, bulbs, stems, and flowers. Thus, traditional markets can facilitate the economic activities of the local community while supporting food security and diversification.

Traditional markets' value in this locale lies as intersections for the ethnobotanical investigation of plant

species. The significance of traditional markets for recognizing the assortment of sold edible plants arises from their unique attributes. These markets are engaged spaces for connecting cultural, social, and economic characteristics. The relations of diverse ethnical classes within these markets provide consumers with a wide variety of edible plants. Residents of certain regions frequently depend on conventional items for their day-to-day nutrition requirements, driving these markets as crucial repositories of ethnobotanical understanding. This study examined traditional markets in East Jakarta since Jakarta is the capital city of Indonesia, in which various ethnicities coexist in this urban market. Although plant species sold in traditional markets are also available in other parts of the town, traditional markets are commonly defined by distinctive local cultures and indigenous ecosystems. This study aimed to determine the ethnobotany of plant species in East Jakarta's traditional markets. This study presents general information on social relation activities, biodiversity, and the supply chain system provided by rural sites. Ethnobotanical exploration is an elementary effort to identify bioprospection and strategic steps for conservation efforts (Afrianto et al. 2020; Afrianto et al. 2021a; Afrianto et al. 2022; Afrianto et al. 2023; Metananda et al. 2023).

MATERIALS AND METHODS

Study areas

The research was conducted at Embrio Kampung Makasar, Rawamangun, and Cijantung traditional markets in East Jakarta, Indonesia (Figure 1). East Jakarta is an administrative city in the eastern part of DKI Jakarta, Indonesia. To the north, East Jakarta is bordered by the administrative cities of North Jakarta and Central Jakarta. Meanwhile, to the east, it borders Bekasi City; to the south, it borders Depok City; and to the west, it borders the administrative city of South Jakarta. These traditional markets are bustling with numerous vendors selling various products, including vegetables, fruits, foodstuffs, clothing, and accessories. These markets are also known as cheap markets due to their affordable prices.

Procedures

The research was carried out using a qualitative descriptive method. We collected data by observing plant diversity and identifying pictures with an ethnobotany approach (Iskandar et al. 2018). Observation and documentation were conducted to record information on edible plant species traded in the traditional markets. We collected data using a purposive sampling method, and 157 traders (kiosks) were selected since they sell produce offline and online. Besides the conventional method (offline), traders also sell online using *Titipku* (https://www.titipku.com). This online shopping application enables housewives to buy groceries, vegetables, fruit, and fresh meat, which are taken directly from the selected market. We utilized this approach because we also wanted to identify edible plants that are being traded online. In this research, the traditional markets studied have several characteristics, namely (i) traditional markets have a bargaining system between sellers and buyers, (ii) traditional markets are owned, built, and managed by the local government, (iii) traditional markets business premises are diverse and combined in the exact location, and (iv) most of the products and services offered are locally produced.

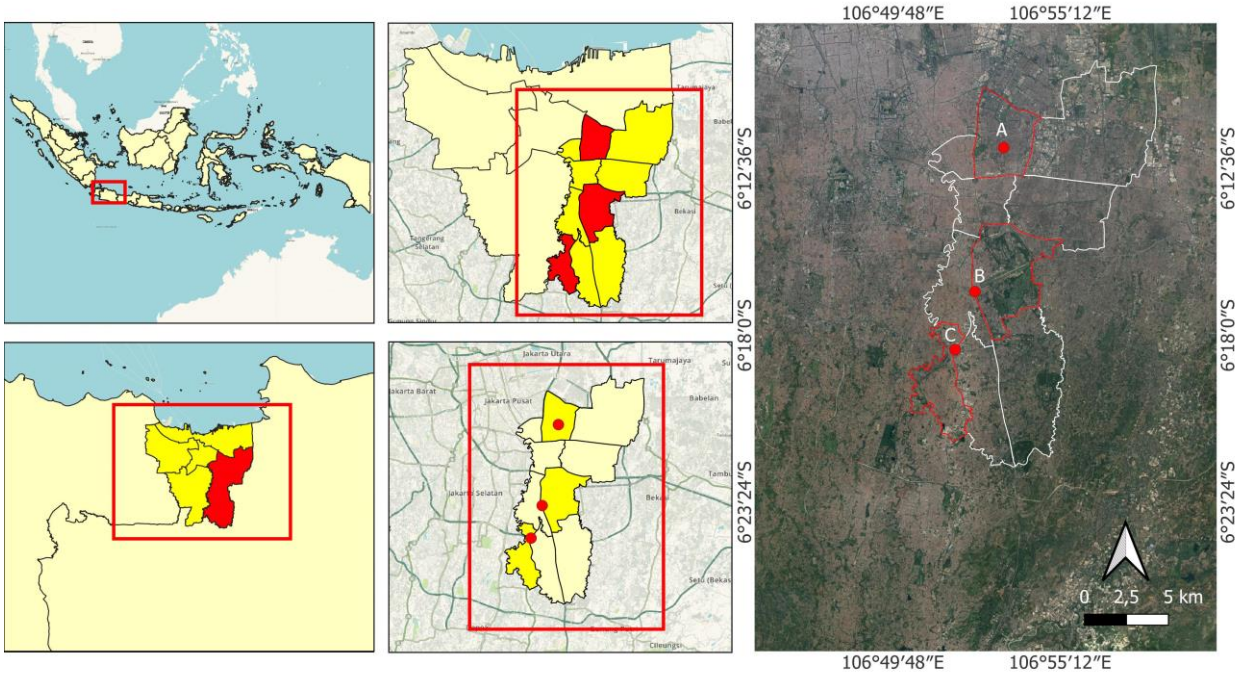

Figure 1. Map of the East Jakarta traditional markets. A. Rawamangun Market; B. Embrio Kampung Makasar Market; C. Cijantung Market

Data analysis

The collected data were identified based on family, part used, categories of commodities, life forms, habitat, processing method, season, availability, IUCN status, and price. Scientific names were confirmed using http://www.plantsoftheworldonline.org, and https://powo.science.kew.org/, which provide millions of global plant names, detailed descriptions, and images. We also reviewed literature using journals, books, proceedings, and other resources to support the related data.

RESULTS AND DISCUSSION

Traditional markets profile

The name Embrio Kampung Makasar is familiar to local residents as the area has been used as a settlement for the people of Makasar since 1686 under the leadership of Captain Daeng Matara. They were former prisoners of war brought to Batavia after the kingdom of Goa under Sultan Hasanuddin lost to the VOC (Dutch trade alliance in the archipelago in the mid-17th to early 19th centuries, commonly known as *kompeni*), which was assisted by the kingdoms of Bone and Soppeng. At first, they were treated as enslaved people in Batavia but subsequently used as auxiliary troops and involved in various wars by the VOC. Finally, in 1673, they were placed North of Amanusgracht, now known as Kampung Baru. In 1810, the troops consisting of Makasar people were then administratively combined with Bugis troops by Governor General Daendels. This regulation kept the Makasar people in Kampung Makasar, even though their number was not as large as before, and they were already mingling with other people from various ethnicities.

Rawamangun Market was built in the 1960s, has a long history, and has become an integral part of the development of the Rawamangun area. Initially, this market only consisted of small stalls selling daily necessities. However, population growth and development have developed into more extensive and comprehensive complexes. Today, the market offers a variety of trading facilities and spaces covering a wide range of sectors.

Cijantung Traditional Market is located in Cijantung area, East Jakarta, Indonesia. It is an important shopping center and a major destination for residents and visitors. The market offers various goods and daily needs, including food, fresh fruit, vegetables, meat, fish, groceries, clothing, accessories, and household goods. It is also known for its culinary variety, where food stalls and street food vendors serve local dishes and interesting culinary variations. Cijantung Traditional Market has a busy atmosphere and bustles with trading activity, especially in the morning when many traders and buyers visit the shops.

The three markets have in common that they sell various edible plants, and the sellers are micro, small, and medium enterprises (MSMEs). Even though all are in East Jakarta, they live in different locations. The trading system in traditional markets is that sellers arrange their wares on tables or sidewalks along the streets or market aisles. Buyers can bargain on the price of the products with sellers (Figure 2). This is also an effort to win the business competition because many sellers sell similar items. Many sellers have been selling their commodities for generations. Traditional markets can facilitate retail or wholesale sales. For wholesalers, sellers will provide a lower price than retail price. Retail profit is generally less, but selling large quantities of items enables sellers to enjoy considerable profit. Certain buyers already have regular sellers, and the established relationship allows buyers to enjoy lower prices, better quality products, up-to-date information, or an easy pre-order benefit.

Traditional markets have advantages and disadvantages compared to modern markets. One of their advantages is a more friendly and interactive atmosphere. Buyers can interact directly with sellers, ask questions about products, and negotiate prices. Traditional markets also often offer local goods, regional specialties, and fresh produce by local farmers. In addition, they also play an essential role in maintaining local culture and traditions. However, traditional markets also have drawbacks. There is a need for improved cleanliness and sanitation, which may be a problem in maintaining product quality and public health. Traditional markets' limited space and facilities hinder business growth and diversification. Overall, traditional markets and modern markets have their respective advantages and disadvantages. The choice between the two depends on individual preference, consumer needs, and local context.

Figure 2. Edible plant products traded in the East Jakarta traditional markets, A. Vegetables; B. Rice; C. Legumes; D. Herbs and spices; E. Fruits/banana varieties

Species diversity and variation

This study found that 140 edible plant species traded in the East Jakarta traditional markets belong to 50 families (Table 1). In addition, there were 181 landraces. In comparing the three markets, we learned that the Embrio Kampung Makassar Market has more edible plants (164 edible plants) than Cijantung Market (133 edible plants) and Rawamangun Market (130 edible plants) (Figure 3). Compared to other studies, the East Jakarta traditional markets can be categorized as having diverse edible plant species. For instance, edible plant species traded in Beringharjo Market (Yogyakarta) included 159 landraces (Iskandar et al. 2018). All identified edible plants were sold online and offline by sellers.

The dominant family of the observed plant species in the study was the Solanaceae (18 species), followed by the Fabaceae (14 species), the Poaceae (13 species), and the Cucurbitaceae (12 species) (Figure 4). The Solanaceae species include vegetables *cabai hijau besar* (*Capsicum annuum*), *cabai merah besar* (*C. annuum*), *cabai rawit putih* (*C. frutescens*), *cabai rawit hijau* (*C. frutescens*), *cabai rawit merah* (*C. frutescens*), *cabe hijau keriting* (*C. annuum* var. *annum*), *cabe merah keriting* (*C. annuum* var. *annum*), *kentang* (*Solanum tuberosum*), *leunca* (*S. nigrum*), *paprika hijau* (*C. annuum* var. *grossum*), *paprika kuning* (*C. annuum* var. *grossum*), *paprika merah* (*C. annuum* var. *grossum*), *terong hijau* (*S. melongena*), *terong ungu* (*S. melongena*), *terong lalap* (*S. melongena*), *tomat merah* (*Lycopersicon esculentum*), and *tomat hijau* (*L. esculentum*).

The Fabaceae family is identified in vegetables, while the Poaceae is identified in staple foods. The Fabaceae family is also dominant because most of its plants are consumed in diverse forms of dishes, such as *asam jawa* (*Tamarindus indica*) (sour vegetables), *buncis* (*Phaseolus vulgaris*) (stir-fried, curry and fried chili sauce), *jengkol* (*Archidendron pauciflorum*) (fresh vegetable/*lalapan*, chilli sambal/*balado*, stew, stir-fried, and chili sauce), *kacang hijau* (*Vigna radiata*) (porridge), *kacang kapri* (*Pisum sativum*) (stir-fried and soup), *kacang kedelai* (*Glycine max*) (tofu, tempeh, and milk), *kacang mede* (*Anacardium occidentale*) (bread), kacang merah (*Phaseolus vulgaris*) (drinks, soup, and vegetable stew in coconut milk/*lodeh*), *kacang panjang* (*V. unguiculata*) (stir-fried, vegetable stew in coconut milk/*lodeh*, curry, and soup), *kacang tanah* (*Arachis hypogaea*) (peanut sambal/*balado*, peanut sauces, and cakes), kacang *tolo* (*V. unguiculata* subsp. *unguiculata*) (chili sauce, vegetable stew in coconut milk/*lodeh*), *kayu secang* (*Caesalpinia sappan*) (the traditional drink), *kecipir* (*Psophocarpus tetragonolobus*) (stir-fry, soup, and stir-fry), *lamtoro* (*Leucaena leucocephala*) (a dish made of coconut and meat/*bothok*, and vegetables salad with spicy coconut sautéed/*urap*).

The edible plants observed in this study were classified into eight plant parts: bulbs, flowers, fruits, leaves, stems, rhizomes, seeds, and tubers (Figure 5). For tubers, there are two types: tuber caliginous and root. The plant part was dominated by fruits (102 species), followed by leaves (31 species), seeds (24 species), tubers (12 species), rhizomes (9 species), bulbs (4 species), stems (2 species), and flower (2 species). Several part plants are used at once, including *cengkeh* (*Syzygium aromaticum*), *jeruk purut* (*Citrus hystrix*), *melinjo* (*Gnetum gnemon*), *pepaya* (*Carica papaya*), *singkong* (*Manihot esculenta*), and *talas Bogor* (*Colocasia esculenta*). The results of this study are similar to the results of a study by Deanova et al. (2021), which discovered that fruits were the majority of plant parts identified in Ir. Soekarno Traditional Market.

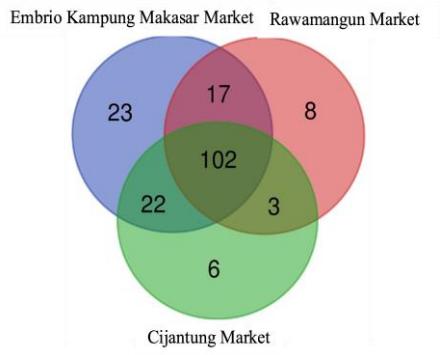

Figure 3. Comparison of total edible plants identified

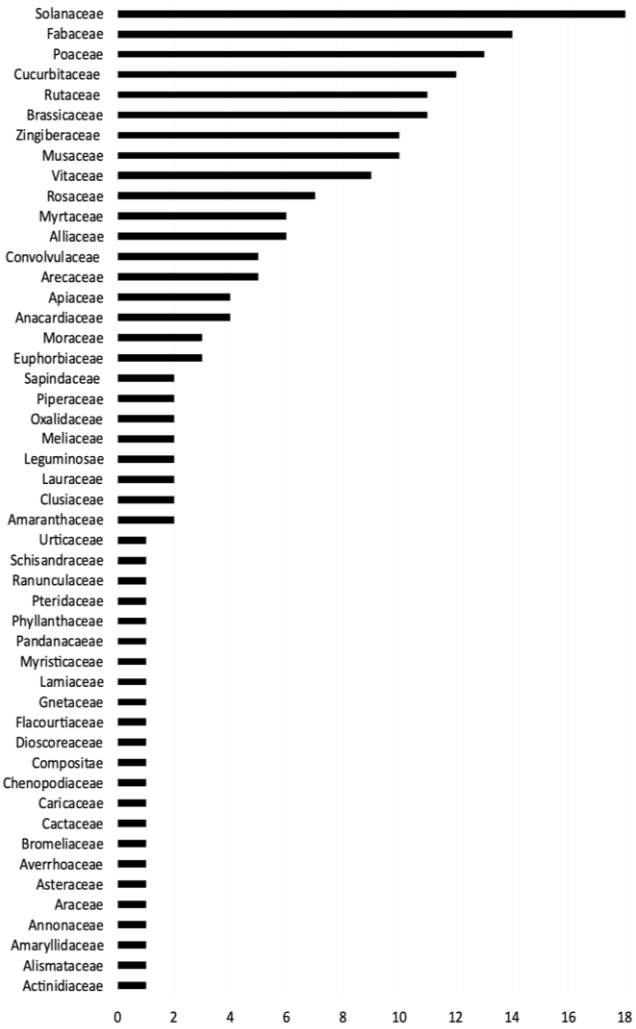

Figure 4. Family groups of edible plants traded in the East Jakarta traditional markets

Figure 5. Categories of plant parts in the East Jakarta traditional markets

The edible plants were then classified into five categories: herb-spice-seasoning, staple food, substitute food, fruit, and vegetables (Figure 6). The dominant edible plants in this study were vegetables (68 species) and fruits (63 species), followed by herb-spice seasoning (52 species), substitute food (13 species), and staple food (7 species) (Figure 6). Several plants appear in multiple categories, such as *bawang batak* (*Allium schoenoprasum*), *bawang bombay* (*A. cepa* var. *cepa*), *bawang merah* (*A. cepa* var. *aggregatum*), *bawang putih* (*A. sativum*), *bawang tunggal* (*A. sativum*), *belimbing wuluh* (*Averrhoa Bilimbi*), *cabai hijau besar* (*C. annuum*), *cabai merah besar* (*C. annuum*), *cabai rawit putih* (*C. frutescens*), *cabai rawit hijau* (*C. frutescens*), *cabai rawit merah* (*C. frutescens*), *cabe hijau keriting* (*C. annuum* var. *annum*), *cabe merah keriting* (*C. annuum* var. *annum*), *daun bawang* (*A. fistulosum*), *kacang tanah* (*A. hypogaea*), *kecombrang* (*Etlingera elatior*), *kentang* (*S. tuberosum*), *pepaya* (*C. papaya*), *singkong* (*M. esculenta*), *tomat merah* (*L. esculentum*), and *tomat hijau* (*L. esculentum*). Plants are often categorized under a double category since they simultaneously offer several differing benefits. This concept, also known as "dual-use" or "double-duty" plants, refers to using plants for various purposes to maximize their advantages. For instance, a plant might be cultivated for its primary yields (as fruits or vegetables) while supplying secondary yields (as medicine). This dual-use practice can improve the plants' economic efficiency by diversifying their revenue potential. Generally, people consume fruit raw or fresh without treatment or modification. Urban residents in Indonesia tend to buy fruits and vegetables from traditional markets (Minot et al. 2015). Additionally, conventional markets provide various products as strategies to be adaptive and resilient in competition with modern markets (Vetter et al. 2019). For edible fruits, some sellers stated that they are selling imported fruits. According to Yang et al. (2021), consumer preference for imported fruits and vegetables tends to be motivated by food safety certification and freshness.

The diversity of edible plant commodities in the East Jakarta traditional markets at the intra-species level was identified based on five categories: texture**,** aroma, morphology, color, and flavor. For example, 10 varieties (landraces) of rice (*Oryza sativa*) are presented in Table 2. This study's number of rice varieties equals the number at Ujung Berung Traditional Market (10 varieties) and is higher than the number at Ir. Soekarno Traditional Market (9 varieties). Rice varieties with a non-sticky texture include *pandan wangi*, *basmati*, *rojo lele*, *ramos*, *kepala super* (R1), and *kepala biasa* (R2). Six rice varieties are fragrant, including *beras pandan wangi*, *ketan putih*, *basmati*, *rojo lele*, *ketan hitam*, and *ketan merah*. There are three rice grain morphology types: round flat size, moderate size, and long-grain rice. The majority of rice has a yellow or yellow clean color. Three rice varieties have a not-tasty flavor, namely *beras merah*, *kepala super* (R1), and *kepala biasa* (R2). Based on price, *beras basmati* is the most expensive (IDR 44,000.00/kg) due to its production process, and this rice variety was generally served to noble families in the past. In addition, *basmati* has an average nutrient content that is two to three times higher than other rice types (Bhattacharjee et al. 2002).

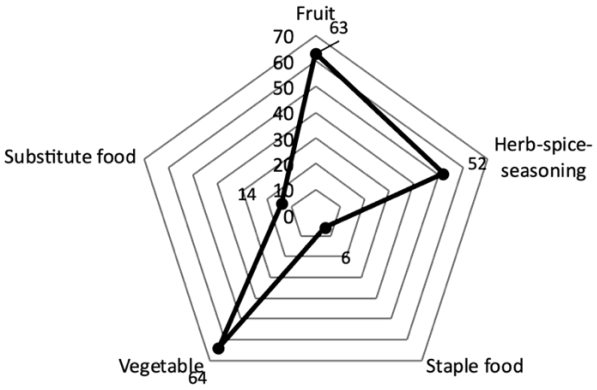

Figure 6. Categories of edible plants in the East Jakarta traditional markets

Table 1. Food availability of edible plants in the East Jakarta traditional markets, Indonesia

Indonesian name	Scientific name	Family	Part used	Category	Life form	Habitat	Processing method	Season	Availability	IUCN status	Price	Market place		
												EKM	RWM	CM
Adas	*Foeniculum vulgare* Mill.	Apiaceae	S	HSS	HR	C	CO	AS	LO	NA	1,200,000 IDR/1kg	+	+	+
Alpukat mentega	*Persea americana* Mill.	Lauraceae	F	F	TR	C	R	AS	H	LC	50,000 IDR/1kg	+	+	+
Anggur merah	*Vitis vinifera* L.	Vitaceae	F	F	LI	C	R	AS	H	LC	100,000 IDR/1kg	+	+	+
Apel fuji	*Pyrus malus* L.	Rosaceae	F	F	TR	C	R	AS	H	DD	62,500 IDR/1kg	+	+	+
Apel malang	*Pyrus malus* L.	Rosaceae	F	F	TR	C	R	AS	H	DD	44,000 IDR/1kg	+	-	+
Apel merah	*Pyrus malus* L.	Rosaceae	F	F	TR	C	R	AS	H	DD	62,500 IDR/1kg	-	+	+
Asam gelugur	*Garcinia atroviridis* Griff. ex T.Anderson	Clusiaceae	F	F	TR	C	CO	AS	LO	NA	45,000 IDR/1kg	+	+	+
Asam jawa	*Tamarindus indica* L.	Fabaceae	F	F	TR	SC	D, CO	AS	H	LC	40,000 IDR/1kg	+	+	+
Asam kandis	*Garcinia xanthochymus* Hook.f ex T.	Clusiaceae	F	F	TR	C	D, CO	AS	LO	LC	12,000 IDR/1kg	+	+	+
Bawang batak	*Allium schoenoprasum* L.	Amaryllidaceae	L	HSS, V	HR	C	CO	AS	LO	LC	10,000 IDR/1bunch	+	+	+
Bawang bombay	*Allium cepa L.* var. *cepa*	Alliaceae	B	HSS, V	HR	C	CO	AS	H	NA	57,500 IDR/1kg	+	+	+
Bawang merah	*Allium cepa L.* var. *aggregatum*	Alliaceae	B	HSS, V	HR	C	CO	AS	H	NA	77,000 IDR/1kg	+	+	+
Bawang putih	*Allium sativum* L.	Alliaceae	B	HSS, V	HR	C	CO	AS	H	NA	54,000 IDR/1kg	+	+	+
Bawang tunggal	*Allium sativum* L.	Alliaceae	B	HSS, V	HR	C	CO	AS	LO	NA	138,000 IDR/1kg	+	+	-
Bayam hijau	*Amaranthus hybridus* L.	Amaranthaceae	L	V	HR	C	BO, CO	AS	H	NA	9,000 IDR/1bunch	+	+	+
Bayam merah	*Amaranthus tricolor* L.	Amaranthaceae	L	V	HR	C	BO, CO	AS	H	NA	10,000 IDR/1bunch	+	-	+
Belimbing	*Averrhoa carambola* L.	Averrhoaceae	F	F	TR	C	R	AS	H	NA	19,000 IDR/1kg	+	-	-
Belimbing wuluh	*Averrhoa Bilimbi* Linn	Oxalidaceae	F	HSS, V	TR	C	CO	SE	LO	NA	34,000 IDR/1kg	+	-	-
Bengkoang	*Pachyrhizus erosus* (L.) Urb.	Leguminosae	F	F	HR	C	R	AS	H	NA	14,000 IDR/1kg	+	+	+
Beras basmati	*Oriza sativa* L.	Poaceae	S	SUF	HR	C	BO	AS	LO	NA	44,000 IDR/1kg	+	-	+
Beras kepala biasa (R2)	*Oriza sativa* L.	Poaceae	S	SF	HR	C	BO	AS	H	NA	13,000 IDR/1kg	+	-	-
Beras kepala super (R1)	*Oriza sativa* L.	Poaceae	S	SF	HR	C	BO	AS	H	NA	17,500 IDR/1kg	+	-	-
Beras ketan hitam	*Oriza sativa* L.	Poaceae	S	SUF	HR	C	BO	AS	H	NA	17,50000 IDR/1kg	+	+	-
Beras ketan merah	*Oriza sativa* L.	Poaceae	S	SUF	HR	C	BO	AS	H	NA	20,000 IDR/1kg	+	-	-
Beras ketan putih	*Oriza sativa* L.	Poaceae	S	SUF	HR	C	BO	AS	H	NA	17,500 IDR/1kg	+	+	-
Beras merah	*Oriza sativa* L.	Poaceae	S	SF	HR	C	BO	AS	H	NA	17,500 IDR/1kg	+	-	+
Beras pandan wangi	*Oriza sativa* L.	Poaceae	S	SF	HR	C	BO	AS	H	NA	17,500 IDR/1kg	+	+	+
Beras ramos	*Oriza sativa* L.	Poaceae	S	SF	HR	C	BO	AS	H	NA	17,500 IDR/1kg	+	-	-
Beras rojo lele	*Oriza sativa* L.	Poaceae	S	SF	HR	C	BO	AS	H	NA	20,000 IDR/1kg	+	+	+
Bit	*Beta vulgaris* L.	Chenopodiaceae	T	V	HR	C	CO	AS	H	NA	46,000 IDR/1kg	+	+	+
Blewah	*Cucumis melo* L.	Cucurbitaceae	F	F	LI	C	R	AS	H	NA	37,500 IDR/1kg	+	-	-
Brokoli	*Brassica oleracea* L. var. *italic*	Brassicaceae	L	V	HR	C	CO	AS	H	NA	48,000 IDR/1kg	+	+	+
Buah naga	*Hylocereus lemairei* (Hook.) Britton & Rose	Cactaceae	F	F	HR	C	R	AS	H	NA	75,000 IDR/1kg	+	+	+
Buncis	*Phaseolus vulgaris* L.	Fabaceae	F	V	LI	C	CO	AS	H	LC	24,000 IDR/1kg	+	+	+
Cabai hijau besar	*Capsicum annuum* L.	Solanaceae	F	HSS, V	SH	C	CO	AS	H	LC	34,500 IDR/1kg	+	+	+
Cabai merah besar	*Capsicum annuum* L.	Solanaceae	F	HSS, V	SH	C	CO	AS	H	LC	161,000 IDR/1kg	+	+	+
Cabai rawit putih	*Capsicum frutescens* L.	Solanaceae	F	HSS, V	SH	C	CO	AS	H	LC	80,000 IDR/1kg	+	+	+
Cabai rawit hijau	*Capsicum frutescens* L.	Solanaceae	F	HSS, V	SH	C	CO	AS	H	LC	92,000 IDR/1kg	+	+	+
Cabai rawit merah	*Capsicum frutescens* L.	Solanaceae	F	HSS, V	SH	C	CO	AS	H	LC	84,000 IDR/1kg	+	+	+

Cabe hijau keriting	*Capsicum annuum* L. var. *annum*	Solanaceae	F	HSS, V	SH	C	CO	AS	H	LC	46,000 IDR/1kg	+	+	+
Cabe merah keriting	*Capsicum annuum* L. var. *annum*	Solanaceae	F	HSS, V	SH	C	CO	AS	H	LC	87,000 IDR/1kg	+	+	+
Cempedak	*Artocarpus integer* (Thunb.) Merr.	Moraceae	F	F	TR	C	R	SE	LO	NA	50,000 IDR/1kg	+	-	-
Cengkeh	*Syzygium aromaticum* (L.) Merr. & L.M.Perry	Myrtaceae	FL	HSS	TR	C	CO	AS	LO	NA	3,500 IDR/1pack	+	+	+
Cherry	*Prunus avium* (L.) L.	Rosaceae	F	F	TR	C	R	SE	LO	LC	200,000 IDR/1kg	-	-	+
Ciplukan	*Physalis angulata* Linn.	Solanaceae	F	F	SH	W	R	SE	LO	LC	850,000 IDR/1kg	-	-	+
Daun bawang	*Allium fistulosum* L.	Alliaceae	L	HSS, V	HR	C	CO	AS	H	NA	23,000.00/1kg	+	+	+
Daun genjer	*Limnocharis flava* (L.) Buchenau	Alismataceae	L	V	HR	W	CO	SE	LO	NA	9,500.00/1bunch	+	-	+
Daun katuk	*Sauropus androgynus* (L.) Merr.	Phyllanthaceae	L	V	TR	SC	BO	SE	LO	NA	9,000.00/1bunch	+	+	+
Pepaya jepang	*Cnidoscolus aconitifolius* subsp. polyanthus (Pax & K.Hoffm.) Breckon	Euphorbiaceae	L	F, V	SH	SC	CO	AS	LO	LC	1,100.00/1bunch	+	-	-
Daun salam	*Syzygium polyanthum* (Wight) Walp.	Myrtaceae	L	HSS	SH	SC	CO	AS	H	NA	6,000 IDR/1bunch	+	+	+
Daun sirih	*Piper betle* L.	Piperaceae	L	HSS	LI	C	BO	AS	LO	NA	12,000 IDR/1bunch	+	-	+
Duku palembang	*Lansium parasiticum* (Osbeck) Sahni & Bennet	Meliaceae	F	F	TR	C	R	SE	H	NA	36,000 IDR/1bunch	+	-	-
Jagung manis	*Zea mays* L.	Poaceae	F	SUF	HR	C	BO	AS	H	LC	7,500 IDR/1pcs	+	+	+
Jagung muda	*Zea mays* L.	Poaceae	F	V	HR	C	CO	AS	H	LC	36,000 IDR/1kg	+	+	+
Jahe emprit	*Zingiber officinale* Roscoe	Zingiberaceae	R	HSS	HR	C	D, M, P	AS	H	DD	46,000 IDR/1kg	+	-	-
Jahe gajah	*Zingiber officinale* Roscoe	Zingiberaceae	R	HSS	HR	C	D, M, P	AS	H	DD	51,000 IDR/1kg	+	-	-
Jahe merah	*Zingiber officinale* var. rubrum	Zingiberaceae	R	HSS	HR	C	D, M, P	AS	H	DD	46,000 IDR/1kg	+	+	+
Jahe putih	*Zingiber officinale* Roscoe	Zingiberaceae	R	HSS	HR	C	D, M, P	AS	H	DD	42,000 IDR/1kg	+	+	+
Jambu air	*Syzygium aqueum* Burn. f. Alston	Myrtaceae	F	F	TR	C	R	AS	H	NA	62,500 IDR/1kg	-	-	+
Jambu bangkok	*Psidium guajava* L.	Myrtaceae	F	F	TR	C	R	AS	H	LC	53,000 IDR/1kg	+	-	-
Jambu biji merah	*Psidium guajava* L.	Myrtaceae	F	F	TR	C	R	AS	H	LC	50,000 IDR/1kg	-	+	+
Jambu kristal	*Psidium guajava* L.	Myrtaceae	F	F	TR	C	R	AS	H	LC	43,000 IDR/1kg	+	+	-
Jengkol	*Archidendron pauciflorum* (Benth) I.C.Nielsen	Fabaceae	F	V	TR	C	R, CO	AS	H	NA	116,000 IDR/1kg	+	+	+
Jeruk kino	*Citrus* sp.	Rutaceae	F	F	TR	SC	R	AS	H	NA	45,000 IDR/1kg	-	+	-
Jeruk lemon	*Citrus limon* (L.) Osbeck	Rutaceae	F	HSS	TR	C	R	AS	LO	LC	35,000 IDR/1kg	+	-	+
Jeruk limo	*Citrus amblycarpa* (Hassk.) Osche	Rutaceae	F	F	TR	C	R	AS	H	NA	72,000 IDR/1kg	+	+	+
Jeruk mandarin	*Citrus reticulata* Blanco	Rutaceae	F	F	TR	C	R	AS	H	NA	38,000 IDR/1kg	-	+	-
Jeruk medan	*Citrus sinensis* (Mill.) Pers.	Rutaceae	F	HSS	TR	C	R	AS	LO	NA	34,500 IDR/1kg	+	+	+
Jeruk nipis	*Citrus aurantiifolia* (Christm.) Swingle	Rutaceae	F	F	TR	C	R	AS	H	NA	30,000 IDR/1kg	+	+	+
Jeruk peras	*Citrus sinensis* (Mill.) Pers.	Rutaceae	F	F	TR	C	R	AS	H	NA	2,300 IDR/1kg	+	+	+
Jeruk pontianak	*Citrus nobilis* var. *microcarpa*	Rutaceae	F	F	TR	C	R	AS	LO	NA	36,000 IDR/1kg	-	+	-
Jeruk purut	*Citrus hystrix* DC.	Rutaceae	F, L	F	TR	C	CO	AS	LO	NA	30,000 IDR/1kg (fruit); 75,000 IDR/1kg (leaf)	-	+	+
Jeruk santang	*Citrus* sp.	Rutaceae	F	F	TR	C	R	AS	LO	NA	40,000 IDR/1kg	-	+	-
Jinten	*Nigella sativa* L.	Ranunculaceae	S	HSS	HR	C	CO, D	AS	LO	NA	100,000 IDR/1kg	+	+	+
Kacang almond	*Prunus dulcis* (Mill.) D.A.Webb	Rosaceae	S	V	TR	C	D	AS	LO	NA	125,000 IDR/1kg	-	-	+
Kacang hijau	*Vigna radiata* (L.) R.Wilczek	Fabaceae	S	V	HR	C	CO	AS	H	LC	40,500 IDR/1kg	+	+	+
Kacang kapri	*Pisum sativum* L.	Fabaceae	F	V	LI	C	CO	AS	H	NA	60,000 IDR/1kg	+	+	+
Kacang kedelai	*Glycine max* (L.) Merr.	Fabaceae	S	V	SH	C	CO	AS	H	NA	48,500 IDR/1kg	+	+	+
Kacang koro	*Canavalia ensiformis* (L.) DC.	Leguminosae	S	V	HR	C	D	AS	LO	NA	90,000 IDR/1kg	-	+	-

Kacang mede	*Anacardium occidentale* L.	Fabaceae	S	F	TR	C	D	AS	H	LC	127,000 IDR/1kg	+	+	+
Kacang merah	*Phaseolus vulgaris* L.	Fabaceae	S	V	HR	C	CO	AS	H	LC	48,000 IDR/1kg	+	+	+
Kacang panjang	*Vigna unguiculata* (L.) Walp.	Fabaceae	F	V	SH	C	CO	AS	H	NA	40,000 IDR/1kg	+	+	+
Kacang tanah	*Arachis hypogaea* L.	Fabaceae	S	HSS, V	HR	C	BO, CO	AS	H	NA	52,000 IDR/1kg	+	+	+
Kacang tolo	*Vigna unguiculata* subsp. *unguiculata*	Fabaceae	S	V	LI	C	CO	AS	H	NA	48,000 IDR/1kg	+	-	+
Kangkung	*Ipomoea aquatica* Forssk.	Convolvulaceae	L	V	HR	C	CO	AS	H	LC	7,500 IDR/1bunch	+	+	+
Kayu manis	*Cinnamomum burmanii* (Nees & T.Nees) Blume	Lauraceae	ST	HSS	TR	C	D, BO	AS	H	NA	92,000 IDR/1kg	+	+	+
Kayu secang	*Caesalpinia sappan* L.	Fabaceae	ST	HSS	BU	SC	BO, D	AS	H	NA	850,000 IDR/1kg	+	-	+
Kecipir	*Psophocarpus tetragonolobus* (L.) DC.	Fabaceae	F	V	LI	C	CO	AS	H	NA	44,000 IDR/1kg	+	+	-
Kecombrang	*Etlingera elatior* (Jack) R.M.Sm.	Zingiberaceae	FL	HSS, V	HR	C	CO	AS	LO	DD	115,000 IDR/1kg	+	+	+
Kedondong	*Spondias dulcis* Parkinson	Anacardiaceae	F	F	TR	C	R	SE	H	NA	15,000 IDR/1kg	-	-	+
Kelapa	*Cocos nucifera* L.	Arecaceae	F	HSS	TR	C	CO	AS	H	NA	16,500 IDR/ 1pcs	+	+	+
Kelengkeng	*Dimocarpus longan* Lour.	Sapindaceae	F	F	TR	C	R	SE	H	DD	75,000 IDR/1kg	+	+	-
Keluwek	*Pangium edule* Reinw.	Flacourtiaceae	F	HSS	TR	C	CO	AS	LO	LC	46,000 IDR/1kg	+	+	+
Kemangi	*Ocimum basilicum* L.	Lamiaceae	F	V	HR	C	R	AS	H	NA	5,000 IDR/1bunch	+	+	+
Kembang kol	*Brassica oleracea* L. var. *capitata*	Brasicaceae	F	V	HR	C	CO	AS	H	NA	46,000 IDR/1kg	+	+	+
Kemiri	*Aleurites moluccanus* (L.) Wild.	Euphorbiaceae	F	HSS	TR	C	CO	AS	H	LC	85,000 IDR/1kg	+	+	+
Kencur	*Kaempferia galanga* L.	Zingiberaceae	R	HSS	HR	C	D, M, P	AS	H	DD	95,000 IDR/1kg	+	+	+
Kenikir	*Cosmos caudatus* Kunth	Asteraceae	L	V	HR	C	BO	AS	H	NA	10,000 IDR/1bunch	+	-	+
Kentang	*Solanum tuberosum* L.	Solanaceae	T	SF, V	HR	C	BO, CO	AS	H	NA	26,500 IDR/1kg	+	+	+
Ketumbar	*Coriandrum sativum* L.	Apiaceae	F	HSS	BU	C	CO, D, P	AS	H	NA	72,000 IDR/1kg	+	+	+
Kiwi hijau	*Actinidia deliciosa* (Chev.) C.F.Liang & A.R.Ferguson	Actinidiaceae	F	F	TR	C	R	AS	H	NA	70,000 IDR/1kg	+	-	-
Kluwih	*Artocarpus camansi* Blanco	Moraceae	F	F	TR	SC	CO	AS	LO	NA	12,500.00/1pcs	+	-	-
Kol putih	*Brassica oleracea* L. var. *capitata*	Brasicaceae	L	V	HR	C	CO	AS	H	DD	16,000 IDR/1kg	+	+	+
Kolang kaling	*Areca catechu* L.	Arecaceae	F	F	TR	C	CO	AS	H	NA	40,000 IDR/1kg	+	+	-
Kubis	*Brassica oleracea* L. var. capitata	Brasicaceae	L	V	HR	C	R, CO	AS	H	NA	17,000 IDR/1kg	+	+	+
Kucai	*Allium ramosum* L.	Alliaceae	L	V	HR	C	CO	AS	H	LC	9,000 IDR/1bunch	+	-	+
Kunyit	*Curcuma longa* L.	Zingiberaceae	R	HSS	HR	C	D, M, P	AS	H	DD	24,000 IDR/1kg	+	+	+
Kurma	*Phoenix acaulis* Roxb.	Arecaceae	F	F	TR	C	D	AS	H	NA	125,000 IDR/1kg	+	+	-
Labu acar	*Sechium edule* (Jacq.) Sw.	Cucurbitaceae	F	V	LI	C	CO	AS	H	NA	20,000 IDR/1kg	+	+	+
Labu air	*Lagenaria siceraria* (Molina) Standl.	Cucurbitaceae	F	V	LI	C	CO	AS	LO	NA	22,500 IDR/1kg	+	+	-
Labu Kabocha	*Cucurbita maxima* L.	Cucurbitaceae	F	F	LI	C	R	AS	LO	NA	30,000 IDR/1kg	-	+	-
Labu parang	*Cucurbita moschata* Durch	Cucurbitaceae	F	F	LI	C	R	AS	H	NA	28,000 IDR/1kg	+	+	+
Lada	*Piper nigrum* L.	Piperaceae	S	HSS	TR	C	D, P, CO	AS	H	NA	210,000 IDR/1kg	+	+	+
Lamtoro	*Leucaena leucocephala* (Lam.) de Wit	Fabaceae	S	V	TR	W	R, BO	AS	LO	NA	6,000 IDR/1pack	+	-	-
Leunca	*Solanum nigrum* L.	Solanaceae	F	V	SH	C	R	AS	H	NA	36,000 IDR/1kg	+	+	+
Lengkuas	*Alpinia galanga* (L.) Willd.	Zingiberaceae	R	HSS	HR	C	CO	AS	H	NA	28,000 IDR/1kg	+	+	+
Lobak putih	*Raphanus sativus* L.	Brassicaceae	T	V	HR	C	CO	AS	H	NA	18,000 IDR/1kg	+	+	+
Mahoni	*Swietenia macrophylla* King	Meliaceae	S	HSS	TR	C	CO	AS	LO	VU	6,000 IDR/35gr	-	-	+
Mangga gedong super	*Mangifera indica* L.	Anacardiaceae	F	F	TR	C	R	SE	H	DD	48,000 IDR/1kg	+	-	-
Mangga harum manis	*Mangifera indica* L.	Anacardiaceae	F	F	TR	C	R	SE	H	DD	50,000 IDR/1kg	+	+	+
Mangga indramayu	*Mangifera indica* L.	Anacardiaceae	F	F	TR	C	R	SE	H	DD	25,500 IDR/1kg	+	+	+

Melinjo	*Gnetum gnemon* L.	Gnetaceae	F, L	V	TR	SC	CO	AS	H	LC	48,000 IDR/1kg (fruits); 50,000 IDR/1kg (leaves)	+	+	+
Melon	*Cucumis melo* L.	Cucurbitaceae	F	V	HR	C	CO, R	AS	H	NA	18,000 IDR/1kg	+	+	+
Mentimun	*Cucumis sativus* L.	Cucurbitaceae	F	V	LI	C	R	AS	H	NA	24,000 IDR/1kg	+	+	+
Nanas	*Ananas comosus* (L.) Merr.	Bromeliaceae	F	F	HR	C	R	AS	H	NA	100,000 IDR/1kg	+	+	+
Nangka	*Artocarpus heterophyllus* Lam.	Moraceae	F	F	TR	C	R	AS	H	NA	25,000 IDR/1kg	+	+	-
Oyong	*Luffa acutangula* (L.) Roxb.	Cucurbitaceae	F	V	LI	C	CO	AS	H	NA	24,000 IDR/1kg	+	+	+
Pakcoy	*Brassica rapa* subsp. Chinensis	Brassicaceae	L	V	HR	C	CO	AS	H	NA	18,000 IDR/1kg	+	+	+
Pakis	*Diplazium esculentum*. (Retz)	Pteridaceae	L	V	HR	W	CO	AS	LO	NA	10,000 IDR/1bunch	+	-	+
Pala	*Myristica fragrans* Houtt.	Myristicaceae	S	HSS	TR	C	CO	AS	H	DD	2,500 IDR/1pcs	+	+	+
Pandan wangi	*Pandanus amaryllifolius* Roxb.	Pandanacaeae	L	HSS	HR	C	CO	AS	H	NA	5,000 IDR/1bunch	+	+	+
Paprika hijau	*Capsicum annuum* L. var. *grossum*	Solanaceae	F	HSS	HR	C	CO	AS	H	NA	69,000 IDR/1kg	+	-	-
Paprika kuning	*Capsicum annuum* L. var. *grossum*	Solanaceae	F	HSS	HR	C	CO	AS	H	NA	69,000 IDR/1kg	+	+	-
Paprika merah	*Capsicum annuum* L. var. *grossum*	Solanaceae	F	HSS	HR	C	CO	AS	H	NA	69,000 IDR/1kg	+	+	+
Pare	*Momordica charantia* L.	Cucurbitaceae	F	V	LI	C	CO	AS	H	NA	24,000 IDR/1kg	+	+	+
Pekak	*Illicium verum* Hook.fil.	Schisandraceae	F	HSS	HR	W	D, CO	AS	LO	NA	4,000 IDR/1pcs	+	+	-
Pepaya	*Carica papaya* L.	Caricaceae	F, L	F, V	SH	C	R	AS	H	DD	9,000 IDR/1pcs (young fruit); 19,000 IDR/1pcs (ripe fruit); 8,000 IDR/1bunch (leaf)	+	+	+
Pete	*Brassica rapa* L.	Brassicaceae	F	V	TR	C	CO, R	AS	H	NA	140,000 IDR/1kg	+	+	-
Pir hijau	*Pyrus communis* L.	Rosaceae	F	F	TR	C	R	AS	H	LC	62,500 IDR/1kg	+	+	+
Pisang ambon	*Musa paradisiaca* var. *sapientum* L.	Musaceae	F	F	HR	C	R	AS	H	NA	44,000 IDR/1bunch	+	-	+
Pisang barangan	*Musa acuminata* L.	Musaceae	F	F	HR	C	R	AS	H	NA	45,000 IDR/1bunch	+	+	-
Pisang kepok	*Musa paradisiaca* L.	Musaceae	F	F	HR	C	R	AS	H	NA	35,000 IDR/1bunch	+	-	+
Pisang lampung	*Musa paradisiaca* L.	Musaceae	F	F	HR	C	R	AS	H	NA	19,000 IDR/1bunch	+	-	+
Pisang mas	*Musa acuminata* Colla	Musaceae	F	F	HR	C	R	AS	H	NA	25,000 IDR/1bunch	+	-	+
Pisang nangka	*Musa paradisiaca* var. *forma typical*	Musaceae	F	F	HR	C	R	AS	H	NA	31,500 IDR/1bunch	+	-	+
Pisang raja	*Musa paradisiaca* var. *raja*	Musaceae	F	F	HR	C	R	AS	H	NA	31,500 IDR/1bunch	+	-	+
Pisang cavendish	*Musa Acuminata* var. *cavendish*	Musaceae	F	F	HR	C	R	AS	H	NA	40,000 IDR/1bunch	+	+	+
Pisang tanduk	*Musa Paradisiacal* var. *corniculata*	Musaceae	F	F	HR	C	R	AS	H	NA	10,000 IDR/1pcs	+	+	+
Pisang uli	*Musa paradisiaca* var. *sapientum*	Musaceae	F	F	HR	C	R	AS	H	NA	16,500 IDR/1bunch	+	-	+
Pohpohan	*Pilea trinervia* Wight.	Urticaceae	L	V	HR	W	R	AS	H	NA	8,000 IDR/1bunch	+	-	+
Rambutan	*Nephelium lappaceum* L.	Sapindaceae	F	F	TR	C	R	SE	H	LC	15,000 IDR/1kg	+	-	-
Salak madu	*Salacca zalacca* (Gaertn.) Voss	Arecaceae	F	F	TR	C	R	SE	H	NA	14,500 IDR/1kg	-	+	-
Salak Pondoh	*Salacca zalacca* (Gaertn.) Voss	Arecaceae	F	F	TR	C	R	SE	H	NA	18,000 IDR/1kg	+	+	+
Sawi hijau	*Brassica juncea* (L.) Czern	Brassicaceae	L	V	HR	C	CO	AS	H	NA	8,500 IDR/1bunch	+	+	+
Sawi pahit	*Brassica juncea* (L.) Czern	Brassicaceae	L	V	HR	C	CO	AS	H	NA	34,000 IDR/1kg	+	+	+
Sawi putih	*Brassica juncea* (L.) Czern	Brassicaceae	L	V	HR	C	CO	AS	H	NA	18,000 IDR/1kg	+	+	+
Selada air	*Nasturtium officinale* R.Br.	Brassicaceae	L	V	HR	C	R	AS	H	LC	9,000 IDR/1bunch	+	-	+
Selada lalapan	*Lactuca sativa* L.	Compositae	L	V	HR	C	R	AS	H	NA	46,000 IDR/1kg	+	+	-
Seledri	*Apium graveolens* L.	Apiaceae	L	V	HR	C	CO	AS	H	LC	34,000 IDR/1kg	+	+	+
Semangka	*Citrullus vulgaris* Schrad	Cucurbitaceae	F	F	LI	C	R	AS	H	NA	12,500 IDR/1kg	+	+	+
Serai	*Cymbopogon nardus* (L.) Rendle	Poaceae	L	HSS	BU	C	CO	AS	H	NA	15,500 IDR/1kg	+	+	+

Singkong	*Manihot esculenta* Crantz	Euphorbiaceae	T, L	SUF, V	SH	C	BO	AS	H	NA	9,000 IDR/1bunch (leaf); 17,000 IDR/1kg (fruit)	+	+	+
Sirsak	*Annona muricata* L.	Annonaceae	F	F	TR	C	R	SE	LO	LC	31,500 IDR/1kg	+	-	-
Stroberri	*Fragaria x ananasa* Duchesne	Rosaceae	F	F	HR	C	R	AS	LO	NA	113,000 IDR/1kg	+	-	+
Talas Bogor	*Colocasia esculenta* (L.) Schott	Araceae	T, L	SUF	HR	C	BO	AS	LO	LC	21,000 IDR/1kg	+	-	-
Talas kimpul	*Xanthosoma sagittifolium* (L.) Schott	Rutaceae	T	SUF	HR	C	BO	AS	LO	NA	19,000 IDR/1kg	+	+	+
Temukunci	*Curcuma aeruginosa* Roxb.	Zingiberaceae	R	HSS	HR	C	CO	AS	LO	LC	45,000 IDR/1kg	+	+	-
Temulawak	*Curcuma zanthorrhiza* Roxb.	Zingiberaceae	R	HSS	HR	C	D, M, P	AS	H	DD	48,000 IDR/1kg	+	+	+
Terong hijau	*Solanum melongena* L.	Solanaceae	F	HSS	HR	C	CO	AS	H	NA	3,200 IDR/1kg	+	+	+
Terong ungu	*Solanum melongena* L.	Solanaceae	F	HSS	HR	C	CO	AS	H	NA	40,000 IDR/1kg	+	+	+
Terong lalap	*Solanum melongena* L.	Solanaceae	F	HSS	HR	C	CO	AS	H	NA	22,000 IDR/1kg	+	+	+
Timun suri	*Cucumis Melo* L. var. *reticulatus* Naudin	Cucurbitaceae	F	F	HR	C	CO, R	AS	H	NA	26,500 IDR/1kg	+	-	-
Tomat cherry	*Lycopersicon esculentum* var. *cerasiforme*	Cucurbitaceae	F	F	HR	C	CO	AS	H	NA	80,000 IDR/1kg	-	+	-
Tomat merah	*Lycopersicon esculentum* Mill.	Solanaceae	F	HSS, V	HR	C	CO	AS	H	NA	40,000 IDR/1kg	+	+	+
Tomat hijau	*Lycopersicon esculentum* Mill.	Solanaceae	F	HSS, V	HR	C	CO	AS	H	NA	40,000 IDR/1kg	+	+	+
Ubi kuning	*Ipomoea batatas* (L.) Lam.	Convolvulaceae	T	SUF	HR	C	BO	AS	H	DD	17,500 IDR/1kg	+	+	+
Ubi merah	*Ipomoea batatas* (L.) Lam.	Convolvulaceae	T	SUF	HR	C	BO	AS	H	DD	17,500 IDR/1kg	+	+	+
Ubi putih	*Ipomoea batatas* (L.) Lam.	Convolvulaceae	T	SUF	HR	C	BO	AS	H	DD	17,500 IDR/1kg	+	+	-
Ubi ungu	*Ipomoea batatas* (L.) Lam.	Convolvulaceae	T	SUF	HR	C	BO	AS	H	DD	17,500 IDR/1kg	+	+	+
Uwi	*Dioscorea alata* L.	Dioscoreaceae	T	SUF	LI	W	BO	AS	LO	NA	28,000 IDR/1kg	+	-	-
Wortel	*Daucus carota* L.	Apiaceae	T	V	BU	C	CO	AS	H	LC	17,000 IDR/1kg	+	+	+

Note: B: bulbs; FL: flowers, F: fruits; L: leaves; S: stems; R: rhizomes; S: seeds; T: tubers; SF: staple food; SUF: substitute food; V: vegetables; HSS: herb-spice seasoning; BU: bush; HR: herb; LI: liana, SH: shrub, TR: tree; C: cultivated; SC: semi cultivated; W: wild; CO: cooked; BO: boiled; R: raw; D: dried; P: powdered; M: mashed; AS: all seasons; SE: seasonal; LO: low; H: high; DD: data deficient; NA: not assessment; LC: least concern; VU: vulnerable

The banana varieties in this study were classified based on aroma, flavor, morphology, and color (Table 5). There were 10 varieties of bananas, namely *pisang lampung* (*Musa paradisiaca*), *pisang mas* (*M. acuminata)*, *pisang raja* (*M. paradisiaca* var. *raja*), *pisang ambon* (*M. paradisiaca* var. *sapientum*), *pisang uli* (*M. paradisiaca* var. *sapientum*), *pisang barangan* (*M. acuminata*), *pisang nangka* (*M. paradisiaca* var. *forma typica*), *pisang cavendish* (*M. acuminata* var. *cavendish*), *pisang kepok* (*M. paradisiaca*), and *pisang tanduk* (*M. paradisiaca* var. *corniculata*) (Table 3). The naming of bananas is usually based on local wisdom inherited through generations. Regarding quality, *pisang raja* has a tasty flavor and is large. In Javanese culture, *pisang raja* is commonly used for special events (Hapsari et al. 2017). *Pisang tanduk* has the highest price at IDR 10,000.00/pc with a length ranging from 25-40 cm, a width of 6-12 cm, and a 4.4-4.8 cm diameter. Generally, one bunch of *pisang tanduk* consists of 1-3 combs and 6-10 fruits in each comb. *Pisang tanduk* has a fruit weight of 300-320 g per fruit.

Onion commodities were divided into seven variations, namely *bawang bombai* (*A. cepa* var. *cepa*), *bawang daun* (*A. fistulosum*), *bawang merah* (*A. cepa* var. *aggregatum*), *bawang putih* (*A. sativum*), *bawang putih tunggal* (*A. sativum*), *bawang kucai* (*A. ramosum*), and *bawang batak* (*A. schoenoprasum*) (Table 4). Morphologically, *bawang batak* is nearly similar to *bawang kucai*. Thus, people often assume that they are the same. In fact, *bawang batak* is smaller than *bawang kucai*. *Bawang batak* is commonly used in typical Batak food due to its crunchy taste and onion-like smell. *Bawang putih tunggal* is a small round garlic with a length of merely 2-5 cm and a strong taste and aroma. The skin of this garlic is purplish white. A single onion consists of only one clove in an inadequate environment. *Bawang putih tunggal* is an essential oil and alternative medicine for skin disorders induced by interfering with *Staphylococcus aureus* growth (Gofur et al. 2019). In addition, *bawang putih tunggal* has a higher price (IDR 138,000.00/kg) than *bawang putih* (IDR 54,000/kg). Figure 7 shows the diversity of plant life forms in the East Jakarta traditional markets, which include bush, herb, liana, shrub, and tree. The dominant life form in the study was herb (90 species), followed by tree (56 species), liana (16 species), shrub (15 species), and bush (4 species).

Table 2. Characteristics of rice varieties in the East Jakarta traditional markets

Variety	Texture	Aroma	Morphology of rice grain	Color	Flavor
Beras pandan wangi	Not sticky	Fragrant	Round flat size	Yellow clean	Tasty
Beras ketan putih	Sticky	Fragrant	Moderate size, slim	Yellow clean	Tasty
Beras merah	Sticky	Not fragrant	Moderate size, slim	Red	Not tasty
Beras basmati	Not sticky	Fragrant	Long-grain	Yellow clean	Tasty
Beras rojo lele	Not sticky	Fragrant	Moderate size	Yellow clean	Tasty
Beras ketan hitam	Sticky	Fragrant	Moderate size, slim	Black	Tasty
Beras ketan merah	Sticky	Fragrant	Moderate size, slim	Red	Tasty
Beras ramos	Not sticky	Not fragrant	Long-grain	Yellow clean	Tasty
Beras kepala super (R1)	Not sticky	Not fragrant	Moderate size	Yellow	Not tasty
Beras kepala biasa (R2)	Not sticky	Not fragrant	Moderate size	Yellow	Not tasty

Table 3. Characteristics of banana varieties in the East Jakarta traditional markets

Variety	Taste	Morphology	Color
Pisang lampung	Sweet with a distinct aroma	Medium-sized with a slightly curved shape	Yellow with brown spots
Pisang tanduk	Sweet with hints of vanilla and honey and a creamy texture	Larger than the regular Cavendish banana with a firm and starchy texture	Bright yellow with some brown spots
Pisang raja	Sweet and soft with a subtle tangy flavor and a hint of honey	Longer and thicker than other banana varieties	Golden-yellow that turns brown
Pisang ambon	Sweet and creamy with a slightly tangy flavor	Small to medium-sized with an average length of about 10-15 cm	Bright green that turns yellow
Pisang uli	Sweet and soft with a slightly tangy flavor	Small to medium-sized with an average length of about 10-15 cm.	Yellow
Pisang barangan	Sweet and soft with a slightly tangy flavor	Small to medium-sized with an average length of about 10-15 cm	Yellow
Pisang nangka	Sweet and creamy	Small to medium-sized with an average length of about 10-15 cm	Yellow
Pisang cavendish	Sweet, soft, and creamy	Medium-sized with a curved shape	Bright yellow
Pisang kepok	Slightly sweet, firm, and starchy	Medium-sized with a slightly curved shape	Yellow
Pisang mas	Sweet and soft with a delicate but less intense flavor	Medium-sized with a slightly curved shape	Yellow

Table 4. Characteristics of onion varieties in the East Jakarta traditional markets

Variety	Aroma	Flavor	Morphology	Color
Bawang bombai	A strong aroma that can be overpowering if not cooked properly	A distinctive flavor that can range from sweet to pungent, depending on the variety	Formed in various shapes and sizes, ranging from round to oblong and small to large	Brown on the outside and white on the inside
Bawang daun	A fresh, grassy aroma that is less strong than *bawang bombai*	A mild, sweet onion flavor that is less pungent than *bawang bombai*	A long, slender green stalk that is a small, white bulb at the end. The green stalks are hollow with a slight curve.	Bright green for its long, slender stalks, with white bulbs.
Bawang merah	A delicate, sweet aroma that is less pungent than regular *bawang bombai*	A milder, sweeter flavor than *bawang bombai*, with a hint of *bawang putih*. Often used in recipes where a more subtle onion flavor is desired.	Smaller than regular *bawang bombai*, with a usually brown or greyish pear-shaped bulb. Comes with papery, coppery skin and a small, pointed tip.	Reddish purple
Bawang putih	A distinct and pungent aroma	A strong, pungent flavor with a distinct aroma that is both sweet and savory	Made up of individual cloves encased in a papery white or purple skin. The cloves are arranged in a tight cluster and are connected to a central stem.	White or off-white outer layer
Bawang putih tunggal	A distinct and pungent aroma	A strong, pungent flavor with a distinct aroma that is both sweet and savory	Typically smaller than regular garlic bulbs with a round shape and a flat bottom	White or off-white outer layer
Bawang kucai	A less pungent aroma than regular *bawang putih*	A less pungent flavor than regular garlic.	Formed with long, thin green leaves resembling blades of grass, which can grow up to 20 inches tall and are hollow inside.	Bright green
Bawang batak	A subtle and fresh aroma. Not as strong or pungent as other onion family members.	A combination of *bawang bombai* and *bawang putih* with a slightly sweet and herbal undertone.	Formed with long, slender green leaves, a bulbous base, and delicate pink or purple flower	Bright green leaves

Table 5. Characteristics of species from the Zingiberaceae family traded in the East Jakarta traditional markets

Variety	Aroma	Flavor	Morphology	Color
Jahe emprit	A strong and slightly citrusy aroma	Uniquely spicy and tangy taste	Comes with a thin and small rhizome compared to other types of ginger	Light brownish-yellow with yellowish-white flesh.
Jahe gajah	A spicy aroma	Strong, pungent, and slightly sweet taste	Comes with a thick and large rhizome that can grow up to 20 cm in length	Light brownish-yellow with yellowish-white flesh.
Jahe merah	A strong aroma that is slightly sweet and floral	Spicy and tangy taste	Smaller than *jahe gajah* but larger than *jahe emprit*	Reddish-brown skin with pinkish-yellow flesh
Jahe putih	A spicy aroma	Strong, pungent, and slightly sweet taste	Usually larger than *jahe emprit* but smaller than *jahe gajah*	Pale brownish-yellow skin with yellowish-white flesh
Lengkuas	Similar to that of ginger, but more floral	Unique and strong flavor that is slightly sweet and citrusy, with a hint of spiciness.	Small and round	Brownish-grey
Temukunci	A distinct, earthy aroma	Strong, spicy flavor that is similar to ginger or turmeric	Long, finger-like rhizomes	Beige to light brown
Temulawak	Similar to that of ginger	Bitter, slightly pungent taste with a subtle citrus note	Large, glossy leaves and a thick, tuberous root system.	Pale yellow or light beige
Kencur	Earthy aroma	Pungent, spicy flavor with a slightly sweet	Thick and knobby	Light brown
Kunyit	A distinctive aroma reminiscent of orange or ginger	Warm, bitter, and slightly pungent flavor	A rough, segmented exterior	Yellowish-brown

Processing method for consumption

Edible plants traded in the East Jakarta traditional markets are highly diverse since many different ethnicities reside in Jakarta, which significantly influences and impacts the local culture. Most edible plants must be cooked before consumption (40%) (Figure 8). In Indonesia, however, people usually consume raw vegetables (31%) or boiled (13%). Betawi is the native ethnic group of Jakarta, with typical food items comprising a mixture of vegetables, namely *gado-gado Betawi* and *ketoprak* (mixed vegetables with peanut sauce). Sundanese ethnic group generally consumes vegetables such as *lalapan* (Sundanese vegetable

salads). According to Hernawati et al. (2022), Sundanese consumes 86 vegetables, sych as *lalapan*. *Lalapan* can be consumed fresh, such as *kubis* (*Brassica oleracea*), *selada* (*Nasturtium officinale*), *kenikir* (*Cosmos caudatus*), *terong* (*S. melongena*), *mentimun* (*Cucumis sativus*), and *kemangi* (*Ocimum bacilicum*). Cooked vegetable species include *bayam* (*Amaranthus hybridus*), *leunca* (*S. nigrum*), *kangkung* (*Ipomoea aquatica*), and *daun genjer* (*Limnocharis flava*), which are often included in vegetable soup, stir-fried, and pickle (Septiani et al. 2020). Amrinanto et al. (2019) stated that consuming *lalapan* can increase blood β-carotene. Javanese ethnic group also consumes *lalapan*, *penyetan ayam* (Javanese fried chicken). This cuisine is sold as street food and can be found in many places in Jakarta. *Penyetan ayam* is eaten with fresh vegetables (*mentimun* and *kemangi*) in addition to *sambal*.

The leading staple food identified in the study was rice. The rice-eating culture in Indonesia is robust and has yet to be replaced by an alternative food source (Widyanti et al. 2014). Several substitute foods in the East Jakarta traditional market include *Xanthosoma sagittifolium*, *Zea mays*, *Dioscorea alata*, and *Ipomoea batatas*. According to Silalahi et al. (2021), *D. alata* is an edible plant that can be used as an alternative food source. In general, alternative food plants are consumed as desserts and side dishes.

The use of edible plants as spices for seasoning is closely related to Indonesian cuisine, which combines many herbs (Adnan et al. 2022). Edible plants most often used include *bawang merah* (*A. cepa* var. *aggregatum*), *bawang putih* (*A. sativum*), and *cabai rawit* (*C. frutescens*). *Cabai rawit* is identic with almost all Indonesian cuisine. It is also an essential *sambal* (chili sauce) ingredient in addition to being used as the primary food seasoning. Some famous types of *sambals* are *sambal terasi* (shrimp paste chili sauce), *sambal bawang* (onion chili sauce), and *sambal tomat* (tomato sauce).

Edible plants, especially from the Zingiberaceae family, are generally used for herbs and spices. Ten species of the Zingiberaceae family are found in the East Jakarta traditional markets, similar to the study conducted by Silalahi et al. (2021a). In the Javanese community, the Zingiberaceae family is often called *empon-empon* and processed for *jamu* (traditional drinks); the plant part is the rhizome. Table 5 shows the characteristics of several rhizomes of *empon-empon* in the East Jakarta traditional markets. *Jamu* is consumed to maintain good health and treat diseases (Elfahmi et al. 2014). Some of the most well-known *jamu* include *beras kencur* and *kunir asem*. The biopharma plants in *kunir asem* are *kunyit* (*Curcuma longa*), *asam jawa* (*T. indica*), *serai* (*Cymbopogon nardus*), brown sugar, *jeruk nipis* (*C. aurantiifolia*), *pandan* (*Pandanus amaryllifolius*), and salt. According to Jalil et al. (2021), *kunir asem* can ease digestion, reduce menstrual pain, serve as an antibiotic, reduce stomach acid, eliminate acne, and freshen the body. *Beras kencur* is generally made of *kencur* (*Kaempferia galanga*), rice (*O. sativa*), *jahe* (*Zingiber officinale*), brown sugar, granulated sugar, *pandan* (*P. amaryllifolius*), and salt. It is usually used to reduce bloating and muscle pain (Nahdi and Kurniawan 2019).

Wild and semi-cultivated plants

In this study, most edible plants were classified as cultivated plants (166 species) with small-scale (gardens and home gardens) and big-scale farming systems (Figure 9).

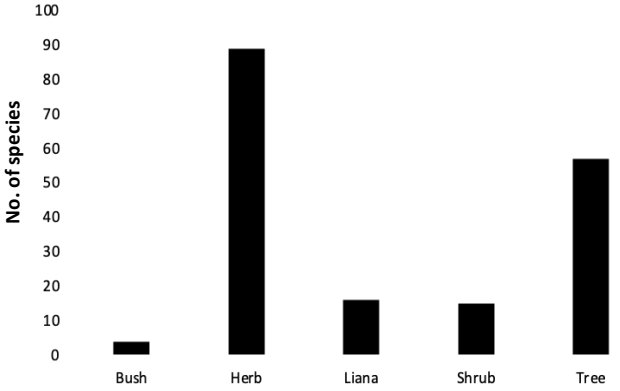

Figure 7. Life forms of edible plants traded in the East Jakarta traditional markets

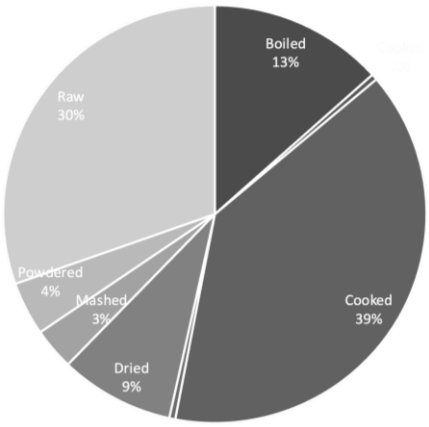

Figure 8. Processing methods of edible plants traded in the East Jakarta traditional markets

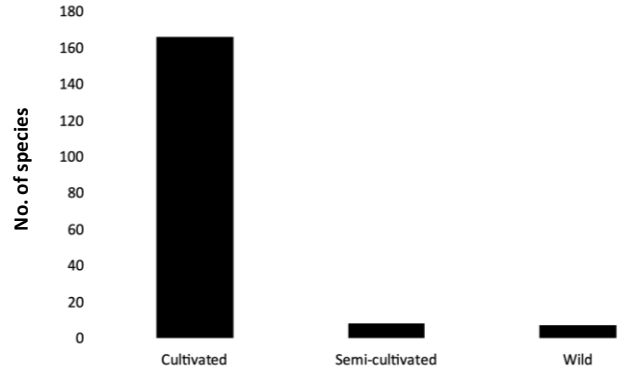

Figure 9. Processing methods of edible plants traded in the East Jakarta traditional markets

However, traditional markets are important for trading wild plants (7 species) and semi-cultivated plants (8 species). Traded wild plants often have high economic and cultural value, as many have medicinal properties recognized by local communities. In addition, some wild and semi-cultivated plants also attract buyers because of their better shelf life or distinctive taste. However, trading wild and semi-cultivated plants in traditional markets also creates problems such as sustainability and environmental protection. For example, over-harvesting can cause a decline in wild plant populations, threaten the survival of certain species, and disrupt natural ecosystems (Groner et al. 2022). In addition, in some cases, illegal trading of rare or endangered plants may also occur in traditional markets. Traditional markets still play an essential role in trading wild and semi-cultivated plants; therefore, a better understanding of these markets' dynamics can adequately balance natural resource use and environmental conservation.

Supply chain of edible plants

The supply chain for agricultural products in the East Jakarta traditional markets starts with farmers who grow vegetables, fruits, and other crops in various regions in Indonesia, especially areas around Jakarta such as Bogor, Tangerang, and Bekasi. After harvest, these agricultural products are then transported by wholesalers to traditional markets. In these markets, the agricultural products are sold to the small traders and retailers operating in the East Jakarta traditional markets. The retail traders then sell these products to the final consumers in traditional markets or even sellers in small markets and traders around Jakarta. In this supply chain, several actors are involved, including farmers, wholesalers, retailers, and consumers. Each participant has different roles and responsibilities in maintaining the quality and availability of agricultural products to the end consumers. This long distribution supply chain has several drawbacks, such as (i) less profit for farmers, (ii) potential food loss during the transit period, and (iii) lack of food security due to the increasing difficulty in tracing the origin of commodities, and (iv) declining product freshness.

Plants that are traded traditionally are influenced by the season and their availability. In the East Jakarta traditional markets, the plants can be obtained in all seasons (91%) with a high availability of 79% (Figure 10). Certain fruits usually have a fertilization period; therefore, the supply is usually low and more expensive. The supply will increase significantly during the main harvest period, while the purchasing power does not increase; thus, unbought fruits will be discarded as waste (Afrianto et al. 2021b).

Digitalization of traditional markets

Digitalization efforts in East Jakarta's traditional markets are currently relatively low. Many traditional markets in Indonesia still use conventional methods of transaction, such as cash transactions and manual inventory counts. Several local e-commerce platforms have developed services to assist traditional market traders in selling online. Tokopedia, Bukalapak, and Shopee have launched features to enable traditional market traders to sell online and make it easier for buyers to buy goods online. Unlike the e-commerce websites mentioned above, several start-ups have developed a business model to facilitate buying and selling goods on the market, including *Titipku*. As the name suggests in Indonesian, the *Titipku* application (which means entrust) uses entrusted services (*jastip*) that allow *Titipku* customers to use the services of *Titipku* partners, or *jastiper*, to buy the goods on their behalf. This business model benefits buyers and sellers and opens job opportunities for those who wish to become *jastipers*. This model is more suitable since the process is easier for consumers and producers. Even though there are many challenges in the digitization of traditional markets in Indonesia, digitalization in conventional markets will further develop through technological progress and increased public interest in online shopping.

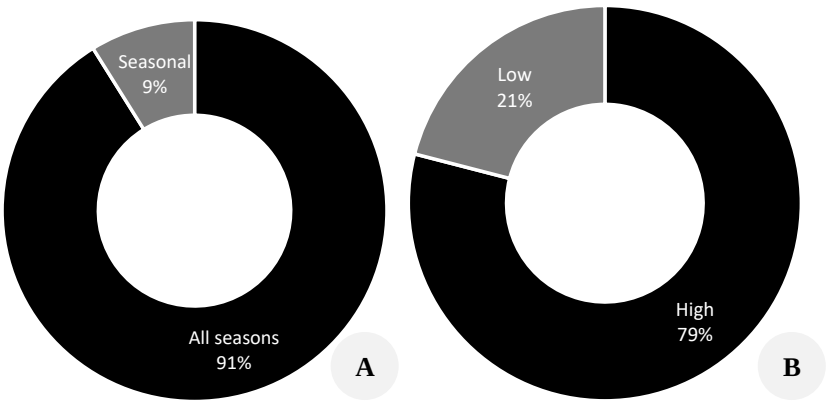

Figure 10. Seasonality and availability of plants traded in the East Jakarta traditional markets

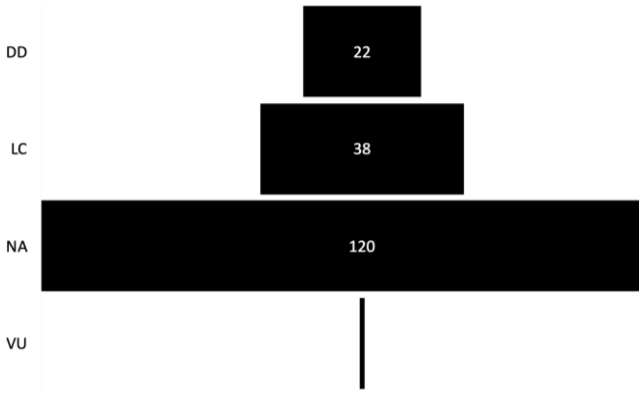

Figure 11. IUCN status of plants traded in the East Jakarta traditional markets: DD: data deficient; NA: not assessment; LC: least concern); VU: vulnerable

Implication for conservation

Traditional markets in Indonesia are closely related to plant conservation. Investigations on the relation emphasize the significance of traditional markets in conserving and enhancing ethnobotanical understanding and facilitating the preservation of indigenous plant species. Traditional markets also play an essential role in promoting and maintaining biodiversity. Sellers in traditional markets often obtain their commodities from local farmers who produce plant varieties typical of their region. By purchasing these products, consumers help maintain unique plant varieties and promote biodiversity conservation. In the three research locations of this study, a variety of plants were found, both cultivated and wild, indicating a connection between species diversity and various ethnobotanical uses for society. In addition, traditional markets are important for researchers to examine Indonesia's biodiversity. The three traditional markets in this study are vibrant hubs that not only showcase the rich diversity of native and local plants but also introduce non-native species into the trade. For example, sellers stated that their carrots are imported produce. Researchers can monitor and analyze the plant types traded in traditional markets to determine whether endangered species require special protection by integrating biodiversity conservation, legal compliance, and public health considerations. However, traditional markets can also trigger the exploitation of natural resources and environmental degradation. In some cases, traditional markets may encourage excessive or unsustainable harvesting of wild plants, which can subsequently threaten the biodiversity of these species. Thus, the government and general public must be aware and wisely manage traditional markets as a source of Indonesia's biodiversity. Figure 11 shows that most plants have no assessment/NA IUCN status (120 species), followed by last concern/LC (38 species), data deficient/DD (22 species), and vulnerable/VU (1 species). Identifying this study's IUCN Red List status enriches the comprehensive examination by integrating a preservation viewpoint and supporting the balance of cultural, economic, and ecological characteristics.

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