

Available online at GSC Online Press Directory

GSC Biological and Pharmaceutical Sciences

e-ISSN: 2581-3250, CODEN (USA): GBPSC2



Journal homepage: <u>https://www.gsconlinepress.com/journals/gscbps</u>

(RESEARCH ARTICLE)



The plants traded at the nursery of Jatikarya, Bekasi District, West Java Province, Indonesia

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Publication history: Received on 01 August 2019; revised on 22 August 2019; accepted on 05 September 2019

Article DOI: https://doi.org/10.30574/gscbps.2019.8.3.0147

Abstract

Nursery is a places to buy, sell, care, and maintain various types of beneficial plants. The type and value of selling plants varies between regions depending on the needs and supply. This study aims to determine the species and economic value of plants traded in the nursery of Jatikarya, Bekasi District, West Java Province, Indonesia. Theresearch was conducted a survey and interviews to the nursery owners or employees. The list of questionnaire were local name of the plants, source of acquisition, supplying, purchasing and selling price of each plants. A number of 130 species belonging 96 genera and 56 families traded at the Jatikarya nursery and the selling price was about 5,000 – 5.000,000 IDR. The trading plants uses as ornament, sources of fruit, ground cover, and shade. The selling value of each species depends on the size, supply, age, method of breeding, and maintenance. The bonsai plants such as Korean banyan (*Ficus campanulata*/ Moraceae) and *anting putri* (*Wrightia religiosa*/ Apocynaceae) have expensive. The rambutans (*Nephelium lappaceum*) and guavas (*Psidium guajava*) are the most popular of fruit plants. The *krokots* (*Portulaca glandiflora*) and lili paris (*Chlorophytum comosum*) are easy to propagate with affordable prices (5,000-10,000 IDR) per unit. In order to increase the productivity of nursery and conservation, it is important to promote and to socialize the role of plants.

Keywords: Nursery; Jatikarya; Ficus campanulata

1. Introduction

Indonesia has a diversity of around 30,000 plant species. The distribution of biodiversity between in the region, island and country is varied. Based on the biogeography of plants, indonesia is divided into three zones, namely is western Malesiana, central Malesiana and eastern Malesiana [1]. The Dipterocarpaceae such as meranti (*Shorea spp.*) are found in western Malesiana, pandan (*Pandanus* spp) and matoa (Sapindaceae) are found in the eastern Malesiana.

The use of plants by human results trading plants by local communities [2]. The transaction of buying and selling plants can be found in the traditional markets, modern markets and nursery. Silalahi et al [3] stated that the buying and selling of medicinal plants in the Kabanjahe traditional market had been carried out for decades and found more than 240 species of medicinal plants to be traded. Various benefits from buying and selling have grown, among others, as a source of income, exchange of local knowledge and preserving local wisdom [4].

In the "traditional markets and supermarkets are used by local communities to buy and to sell plants for some purposes such as fruits, vegetable, staple food [5], while in the nursery are also carried out nurseryes and maintenance of plants that are traded [6-7]. Its shows that in the nursery have the very complex of problem, so its need the plant management which resulted the sustainable the nursery [8].

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Various types of plants are traded in nursery such as ornamental plants, fruit-producing plants, and shade plants [8]. Plants that are traded in nursery are thought to differ from one location to another. Some factors that are thought to influence include capital [9], plant habitus [10], and nursery size [7]. Singh et al [10] stated that plant species with tree seeds in nursery in urban areas were less than those in peri urban nursery.

Since the 2000s, in Jakarta area including Bekasi begun nursery to answer the needs of plants by residents of Jakarta and its surroundings. Silalahi and Sihotang [11] stated that trading plants in nursery in Bekasi are dominated by herbal plants because they had smaller size and faster propagation. The people in the city have a narrow land, so they rarely use trees as garden plants.

Jatikarya is of the regional of the Bekasi district that has prospects for buying and selling various types of plants. Until now, the research of nursery trading plant is still limited, even though the prospects for nurseryes in the economic and ecological fields need to be studied as an effort to preserve biodiversity and as a source of income. This study aims to determine the trade and diversity of nursery plants in Jatikarya, Bekasi District. The results of this study are expected to become one of the plants database.

2. Material and methods

2.1. Data collection in the field

To find out the nursery types at Jatikarya, surveys and observations were conducted. The data Plants were photos, local names, habitus and sale value. To complete the data, the identity of the selection or employee in the nursery is also asked, including name, age, gender and ethnicity. Identification was done by comparing the types of plants obtained with the Flora of Java Volume II-III book [12-13].

2.2. Analysis of data

Data analysis is carried out qualitatively including the types of plants being traded, habitus and selling prices. Analysis of plant diversity carried out descriptively by grouping plants based on habitus (trees, shrubs, herbs), benefits (ornamental plants, shade, and other functions), genus and family.

3. Results and discussion

3.1. Description of traders in nursery of Jatikarya

The traders nurseries of Jatikarya are Javanese, Sundanese and Betawi ethnic that has been trading for 8-31 yeas 8-31 years. All traders are male, aged 38-50 years old. Every nursery has employees whose job is to preserve plants while helping buy-sell transactions. Buying Plant and selling transactions at Jatikarya Nursery starts from 08.00-17.00.



Figure 1 Structuring of plants at the nursery of Jatikarya, Bekasi District, West Java Province, Indonesia. A. Display the front by arranging a simple landscape; B. Display by arranging plants by hanging plants on the nursery ceiling

The number of employees' 1-3 people depends on the size and amount of work. To attract customers, the owners or employees organize the front display of the nursery attractively by using its own plants while at the same time making efficient use of space and land (Figure 1a). Placement of plants in nursery space is adjusted to the needs of the sun, size, and the need for water. Small plants that require high humidity are hung on the nursery ceiling and protected from direct light using paranet (Figure 1b).

The nursery also provide various other materials such as pots, planting media, seeds, fertilizers and other plant maintenance tools (roasting, spray, ornamental stones) to customers (Figure 2). When viewed from the volume, the sales of planting media and pots are most in demand and the size and type of pots are adjusted to the type of plants to be cultivated. Potted plants with a diameter of 50-100 cm are used for fruit trees, while pots with a diameter of 10-30 cm are used for ornamental plants.



Figure 2 The planting media (organic fertilizer) and pots are traded at the nursery of Jatikarya, Bekasi District, West Java Province, Indonesia

In addition to buying and selling transactions at the nursery, weeding, fertilizing, and other treatments are also carried out. Sihotang et al [7] (2019) stated that for efficiency in nursery management good management is needed so that the continuity and development of the nursery can be improved. In nurseries some traders also use plastic waste from mineral water, which can directly reduce waste (Figure 3). Some plants are propagation with cuttings such as wijaya kusuma, cactus and *Draecaena*. Aglaonema spp. bred by separating some buds that have been formed. The nurseryes carried out by nursery owners are mostly in the form of stem cuttings and by the separation of the parent plant clumps. It aims to minimize production costs so that the selling price can be reduced.



Figure 3 The activities at the nursery of Jatikarya, Bekasi District, West Java Province, Indonesia. A. Nurseryes by separating clumps and stem cuttings. B. Waste plastic used mineral water as a nursery container.

3.2. Diversity of Plants

The research found130 species belonging to 96 genera and 56 families (Figure 4). Most of the plants belonging the Araceae, Arcaceae, and Asparagaceae families (Table 1). The Araceae plants are the ornamental plants that have attractive leaves characters such as *Aglaonema* spp and *Anthurium* spp. The *Aglaonema* spp are the plant have colorful leaves with a relatively expensive selling price (200,000 IDR) and many devotees.

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Figure 4 The number of families, genera and species are traded at the nursery of Jatikarya, Bekasi District, West Java Province, Indonesia.

Table 1 Local names, scientific names and benefits of plants at the nursery of Jatikarya, District, West Java Province,Indonesia

Family	Scientific name	Local name	Uses
Adiantaceae	Adiantum sp.1	Suplir dolar	Ornamental plant
	Adiantum sp.2	Suplir keriting	Ornamental plant
Agavaceae	Agave variegata	Agave variegata	Ornamental plant
	Agave sp	Agave	Ornamental plant
Amaranthaceae	Alternathera reineckii	Erpa	Ornamental plant
	Celosia cistata	Jengger ayam	Ornamental plant
Amaryllidaceae	Crynum asiaticum	Bakung	Ornamental plant
	Zephyranthes candida	Bunga bawang	Ornamental plant
Anonaceae	Polyalthia longifolia	Globokan tiang	Shading
Apocynaceae	Alstonia shcolaris	Pulai	Shading
	Pulmeria rubra	Kamboja bali	Ornamental plant
	Adenium sp.	Kamboja jepang	Ornamental plant
	Wrightia religiosa	Anting putri	Ornamental plant
Araceae	Aglaonema crispum	Sri rejeki	Ornamental plant
	Aglaonema picta	Beras tumpah	Ornamental plant
	Aglaonema sp.1	Snow white	Ornamental plant
	Aglaonema sp.2	Aglonema	Ornamental plant
	Aglaonema sp.3	Aglonema lipstik	Ornamental plant
	Anthurium crystallinum	Kuping gajah	Ornamental plant
	Anthurium sp.1	Gelombang cinta	Ornamental plant
	Anthurium sp.2	Anturium	Ornamental plant
	Anthurium sp.3	Anturium kol	Ornamental plant
	Epipremnum aureum	Sirih gading	Ornamental plant
	Epipremnum aureum	Sirih gading variegata	Ornamental plant

	variegata		
	Spathiphyllum sp.	Spatufilium	Ornamental plant
	Zamioculcas zamiifolia	Daun dolar	Ornamental plant
Araliaceae	Schefflera aboricola	Wali songo	Ornamental plant
Arecacea	Crisalidocarpus lutenscens	Palem Kuning	Ornamental plant
	Cyrtostachys renda	Palem merah	Ornamental plant
	Dypsis lutescens	Palem Putri	Ornamental plant
	Hyophorbe lagenicaulis	Palem Botol	Ornamental plant
	Livistona saribus	Palem kipas	Ornamental plant
	Phoenix roebelenii	Palem ponix	Ornamental plant
Asparagacceae	Asparagus densiflorus	Ekor tupai	Ornamental plant
	Chlorophytum comosum	Lili Paris	Ornamental plant
	Cordilyne terminalis	Hanjuan Merah	Ornamental plant
	Dracaena marginata var tricolor	Trikolor	Ornamental plant
	Sansiviera trivasciata	Lidah mertua	Ornamental plant
	Sansiviera sp.	Lidah mertua variegata	Ornamental plant
Aspleniaceae	Asplenium scolopendrium	Kadaka	Ornamental plant
	Asplenium nidus	Paku sarang burung	Ornamental plant
	Asplenium sp.1	Kadaka gelombang cinta	Ornamental plant
	Asplenium sp.2	Kadaka Keriting	Ornamental plant
Athyriaceae	Diplazium sp.	pakis paku	Ornamental plant
Begoniaceae	Begonia sp.1	Begonia	Ornamental plant
	Begonia sp.2	Begonia coklat	Ornamental plant
Bombacaceae	Durio zibethinus	Durian	Fruit resources
Boraginaceae	Nemophila menziesii	Blue eyes	Ornamental plant
Bromeliaceae	Bromelia sp.1	Bromelia hijau	Ornamental plant
	Bromelia sp.2	Bromelia lipstik	Ornamental plant
	Bromelia sp.3	Bromelia coklat	Ornamental plant
	Bromelia sp.4	Giant	Ornamental plant
Cactaceae	Epiphyilum oxipetalum	Wijaya kusuma	Ornamental plant
	Opuntia cochenillifera	Centong	Ornamental plant
Cannaceae	Canna discolor	Ganyong	Ornamental plant
Casuarinaceae	Casuarina equisetifolia	Cemara udang	Ornamental plant
Combretaceae	Combretum indicum	Melati belanda	Shading
	Terminalia mantaly	Ketapang kencana	Shading
Commelinaceae	Rhoeo discolor	Adam Hawa	Ornamental plant
	Zebrina pendula	Sabrina	Ornamental plant

Crassulaceae	Kalanchoe sp.	Cocor bebek	Ornamental plant
Cuppressaceae	Cupressus sempervirens	Cemara lilin	Ornamental plant
	Cupressus papuanus	Cemara Papua	Ornamental plant
	Juniperus comunnis	Cemara Salju	Ornamental plant
	Thuja occidentales	Cemara kipas	Ornamental plant
Cycadaceae	Cycas revulota	Sikas	Ornamental plant
	<i>Cycas</i> sp.	Pakis haji	Ornamental plant
Echinoceae	Echinodorus palifolius	Melati Air	Ornamental plant
Euphorbiaceae	Acalypha siamensis	Teh-tehan	Ornamental plant
	Ecoecaria cochinchinensis	Sampang darah	Ornamental plant
	Euphorbia pulcherrima	Kestuba	Ornamental plant
	Codiaeum variegatum	Puring Kirana	Ornamental plant
Equisetaceae	Equisetum debile	Bambu Air	Ornamental plant
Fabaceae	Arachis pintoi	Kacang-kacangan	Ornamental plant
	Bahunia purpurea	Butterfly	Ornamental plant
Heloconiaceae	Heliconia paittacorum	Sepit udang	Ornamental plant
Hemerocallidaceae	Dianella tasmanica	Lili brasil	Ornamental plant
Hydrangeaceae	Hydrangea macrophylla	Brokoli hias	Ornamental plant
Iridaceae	Neomarica longifolia	Iris	Ornamental plant
Lamiaceae	Coleus blumei	Miana	Ornamental plant
	Mentha × piperita	Daun mint	Medicinal plant, vegetable
Liliaceae	<i>Lilium</i> sp.	Lili umbi	Ornamental plant
	Ophiopogon japonicus	Ucai	Ornamental plant
	Sansiviera sp.	Lidah mertua	Ornamental plant
Lythraceae	Cuphea hyssopifolia	Taiwan	Ornamental plant
Malvaceae	Hibiscus tiliaceus	Waru variegata	Ornamental plant
	Hibiscus rosa sinensis	Spatu merah	Ornamental plant
Marantaceae	Maranta arundinacea	Maranta	Ornamental plant
	Calathea lutea	Talatea	Ornamental plant
Moraceae	Ficus campanulata	Beringin Korea	Ornamental plant
	Ficus sp.1	Beringin sianto	Ornamental plant
	Ficus sp.2	Beringin variegata	Ornamental plant
	Streblus asper	Serut	Ornamental plant
Myrtaceae	Myrciaria cauliflora	Anggur Brazil	Ornamental plant
	Psidium guajava	Jambu biji	Fruit resources
	Syzygium oleana	Pucuk Merah	Ornamental plant
	Syzygium jambos	Jambu mawar	Fruit resources
	Syzygium malaccense	Jambu Jamaika	Fruit resources

Nelumbonaceae	Nelumbo nucifera	Lotus pink	Ornamental plant
Nyctagynaceae	Bougenvillea spectabilis	Bougenvilla bonsai	Ornamental plant
Nymphaceae	<i>Nymphaea</i> sp.	Teratai	Ornamental plant
Oleaceae	Jasminum sp.	Jasmin	Ornamental plant
Poaceae	Bambusa vulgaris	Bambu kuning	Ornamental plant
	Thryrsostachys siamensis	Bambu jepang	Ornamental plant
Piperaceae	Piper betle	Sirih hijau	Medicinal plant
	Piper crocratum	Sirih merah	Ornamental plant
Polypodiaceae	Plathycerium bifurcatum	Paku tanduk rusa	Ornamental plant
Portulacaceae	Portulaca glandiflora	Krokot	Ornamental plant
Rosaceae	Rosa hybrida	Mawar pink	Ornamental plant
Rubiaceae	Ixora siaminensis	Asoka pink	Ornamental plant
	Ixora sp.1	Asoka kuning	Ornamental plant
	Ixora sp.2	Asoka putih	Ornamental plant
	Mussaenda philipcica	Nusa indah	Ornamental plant
Solanaceae	Capsicum frustecens	Cabe rawit Thailand	Spices
	Capsicum annum	Cabe kecil	Spices
	Solanum melogena	Terong	Vegetable
Rutaceae	Citrus amblyacarpa	Jeruk limau	Spices
	Citrus aurantiafolium	Jeruk nipis	Spices, medicinal plant
	Citrus sinensis	Jeruk manis	Fruit resources
	Citrus sp	Jeruk peras	Fruit resources
	Evodia suaveolens	Jodiak	Ornamental plant
	Murraya paniculata	Kemuning	Ornamental plant, medicinal plant
Sapindaceae	Dimocarpus longan	Klengkeng	Fruit resources
	Nephelium lappaceum	Rambutan	Fruit resources
Urticaceae	Pilea cadieri	Mutiara	Ornamental plant
Vitaceae	Vitis vinifera	Anggur hijau	Fruit resources
Verbenaceae	Lantana camara	Lantana orange	Ornamental plant
	Lantana montevidensis	Lantana pink	Ornamental plant
	Lantana sp.1	Lantana kuning	Ornamental plant
	Lantan sp.2	Lantana putih	Ornamental plant
Zingeberaceae	Costus spicatus	Pacing	Ornamental plant

Based on the life form, the traded plants at the Jatikarya nursery are herbs, shrubs and trees. Herb is the plant which have the plant stems contain a lot of water and its size relatively smaller compared to other types. These types are a choice for consumers with small yard or home garden. Most of the traded herbs have attractive leaves (*Aglonema* spp., *Bromelia* spp., and *Sansiviera* spp.).



Figure 5 The types of habitus plant at the nurseryes of Jatikaya, Bekasi District, Java West Province, Indonesia. A. Herb (*Bromelia* sp.); B. Shurb (*Schefflera aboricola*); C. Shurb (*Bougenvillea spectabilis*); D. Tree (*Hibiscus tiliaceus*).

Bonsai plants which the rootstock is different from the upper stem were traded plants at the nurseryes. The rootstock is large and sturdy, while the upper stem is a species with a dense branching pattern. To increase the number and size of clumps can be done by pruning (figure 5). The selling value of bonsai plants depends on the size and beauty of the structure of canopy.



Figure 6 The types of bonsai plants are traded at the nursery of Jatikarya, Bekasi District, Java West Province, Indonesia. A. Bonsai of Korean banyan (*Ficus campanulata*); B. Bonsai of *anting putri (Wrightia religiosa)*

The selling price of the traded plants varies between Rp. 5,000 to millions of rupiah. Several factors that influence the selling price include size, age, availability, maintenance and its trend value. In general, plants are directly proportional to size, therefore plants with large size are higher than others.

Some of the plants have higher consumers such as rambutans (*Nephelium lappaceum*) and guavas (*Psidium guajava*) and mangos (*Mangifera indica*). These are common plants that easily can be found in yard and gardens because of the fruit times. The ornamental plants which high demand are plants that easy to care (*Codiaeum variegatum, Equisetum debile*), and attractive leaves (*Aglaonema* spp, *Phylodendron* spp).

4. Conclusion

The research founded more than 130 species of plants traded in the Jatikarya nursery have selling price from 5,000 – 5,000,000 IDR. The price of each type of plant depends to size, supply, age, method of breeding, and maintenance. Bonsai plants such as Korean banyan (*Ficus campanulata*/ Moraceae) and *anting putri* (*Wrightia religiosa*/ Apocynaceae) are expensive. Rambutans (*Nephelium lappaceum*) and guavas (*Psidium guajava*) are the type of fruit trees that have a great demand.

Compliance with ethical standards

Acknowledgments

We are grateful to Lidia Sianturi and Tri Putri Marito for data collection in the field and for the nursery owners in Jatikarya, who provided information in this research. Our gratitude to the Institute for Research and Community Services (Lembaga Penelitian dan Pengabdian pada Masyarakat), Universitas Kristen Indonesia, which has promoted this research.

Disclosure of conflict of interest

The authors declare no conflict of interest.

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How to cite this article

Silalahi M. (2019). The Plants Traded at the Nursery of Jatikarya, Bekasi District, West Java Province, Indonesia. GSC Biological and Pharmaceutical Sciences, 8(3), 85-93.