

Consumer Preference Analysis of Phalaenopsis Orchid Variety

Nurmalinda ^{1,*}, Dedeh Siti Badriah², and Suskandari Kartikaningrum²

¹ Research Center for Behavioral and Circular Economics, National Research and Innovation Agency. Jl. Gatot Subroto No.10, South Jakarta, 12710 Indonesia

² Research Center for Horticultural and Estate Crops, National Research and Innovation Agency. Jl. Raya Jakarta-Bogor Km 47, Cibinong, Bogor, West Java 16911, Indonesia

Abstract. The majority of new Phalaenopsis orchid varieties circulating in Indonesia are still imported from abroad. To limit imports, orchid breeders was trying to produce new crossbred varieties that were needed by orchid producers and lovers in Indonesia. Before being distributed to orchid lovers, a consumer preference test was conducted to find out which orchid varieties were favored by consumers. In this regard, the aim of the study was to assess consumer preferences of Phalaenopsis orchid variety. The survey was carried out online on June 20-27, 2022, among 215 respondents from DKI Jakarta and West Java, with questionnaires distributed personally via social media links (WhatsApp). Respondent selection was done by simple randomization (simple random sampling). The Chi Square test was used to analyze the data. The results showed that there is sufficient evidence to reject H₀ and accept H₁. Candidate varieties of Phalaenopsis 1 (Puspita Devi Agrihorti) are preferred over other varieties. There is a considerable variation in the distribution of preferences between the candidate variety and the comparison variety of Phalaenopsis. The implication of this research was that the existence of new varieties of orchids can reduce our dependence on Phalaenopsis orchid varieties from abroad.

1 Introduction

Orchidaceae is one of the largest flowering plant families, containing some of the most important decorative plants on the market [1]. Orchids come in a wide range of shapes, colors, and appearances. There are around 20,000 orchid species worldwide [2]. Orchids are widely utilized and traded for a range of purposes, both legally and illegally, sustainably and unsustainably [3]. Many consumers have been drawn its charm by its beautiful appearance. According to Romadlon et.al. [4], the orchid family's diversity stems peculiarity microbes, the variety in which it flourishes. Today's orchids range from soil orchids (Terrestrial) to orchids that live attached to other plants (Epiphytes and Semi Epiphytes), orchids that grow on rocks (Lithophytes), and orchids that live and grow on media containing humus or dry leaves (Saprophytes). Epiphytic orchids such as *Dendrobium*, *Vanda*, *Phalaenopsis*, *Cattleya*, and *Oncidium*, as well as some terrestrial orchids such as *Renanthera*, *Arachnis*,

* Corresponding author: lindaguno@yahoo.com

and *Aranthera*, are often found and well known to the public. Some orchid species, however, are threatened by a variety of factors, including habitat degradation, human involvement, and over exploitation as a result of growing market demand in the trade [5], [6].

The domestic orchid trade nevertheless has a promising future. In addition to being satisfied by native production, orchids marketed in Indonesia are also imported. From 2015 to 2019, the import volume of orchid commodities increased at a rate of 138.71% each year, resulting in an average import volume of 102.84 thousand kilograms [7]. Despite the introduction of new forms of decorative plants, orchid customers continue to seek out orchids from flower sellers for use as house decorations. Similarly, orchid lovers are always adding new types of orchids to their collection. Sometimes price is not always an issue, especially when it comes to religious and festive occasions [8].

Phalaenopsis is a popular type of orchid among customers. Their varied flower shapes and colors, as well as their long flowering periods, have raised consumer interest, and the promotion of the import and export of phalaenopsis potted and cut flowers has expanded global demand [9]. In Indonesia, *Phalaenopsis amabilis* (Moon orchid) was recognized as "Puspa Pesona" by Presidential Decree No. 4 in 1993. However, because orchids have a high economic value, harvesting them in forests can jeopardize their survival and perhaps imperil them [10].

Indonesia, as one of the most well-known orchid-producing countries in the world, is home to around 25% of the world's orchid species. This signifies that sufficient quantities of the possible parent material for crossbreeding are accessible. Some novel crossbreeds (hybrid varieties), such as *Phalaenopsis* orchids, are still imported from abroad, particularly Taiwan. The scarcity of *Phalaenopsis* orchid hybrids in Indonesia is attributable not only to a lack of propagation technique, but also to the long time it takes to generate these kinds. However, dependence on foreign countries must be decreased by beginning to generate hybrids of popular market kinds through crosses. Prior to 2023, Agricultural Research and Development Agency researchers began developing these hybrids, which are presently being developed by National Research and Innovation Agency orchid researchers. Domestic orchid breeders will have easy access to parent materials for crosses because the country has a vast spread of *Phalaenopsis* orchids.

The opinions of consumers regarding a product represent consumer preferences, which are used to choose the product [11]. Sabran [22] defines attitude as the judgment, feelings, and tendency of a person who regularly loves or dislikes a thing. In relation to the crossing process, before the crossing result is released, it is required to examine the preference of the crossed orchid, whether the crossed orchid is favored by customers or not.

2 Research Method

The survey was carried out online on June 20-27, 2022, among 215 respondents from DKI Jakarta (119 respondents) and West Java (96 respondents), with questionnaires distributed personally via social media links (WhatsApp). As a large city, many Jakarta consumers are more knowledgeable about the types of orchids by social media, and so with West Java. The research result of Anggraeni [12], offline and online consumers require social media as a resource for information on orchid flower shops and the types of orchids they are interested in, such as *Dendrobium* and *Phalaenopsis*. Respondent selection was done by simple randomization (simple random sampling). Before respondents filled out the questionnaire, they were screened to see how much they knew about orchids. If they are knowledgeable about orchids, they can continue to answer the question. The data acquired were both primary and secondary. The primary data were age, occupation, and gender, plant appearance and flower pattern, flower size, peduncle length (PL), peduncle diameter (D), rachis length (R), and number of flowers/stalks. The secondary data was the quality standards for *Phalaenopsis*

orchid hybrids from National Standardization Agency [13]. The candidate orchid tested was *Phalaenopsis* 1 as clone number D826-18 (Puspita Devi Agrihorti), while the comparison were *Phalaenopsis* 2 (Puspita Ayu Pujiastuty) and *Phalaenopsis* 3 (Indu Pramesi).

In addition, the morphology of candidate variety of *Phalaenopsis* Puspita Devi Agrihorti was studied. The observation test was conducted out in accordance with the Ornamental Plant Characterization Guidelines [14], from November 2021 to April 2022. The morphology data of *Phalaenopsis* Ayu Pujiastuty Agrihorti and *Phalaenopsis* Indu Pramesi used variety description data from Decree of Horticultural Plant Variety Registration Certificate. Several quantitative characteristics were observed, including leaf length, leaf width, number of leaves, lip length, flower stalk length and diameter, rachis length, and number of flowers, flower length and width. The observations of the candidate varieties were compared to *Phalaenopsis* Puspita Ayu Pujiastuty and *Phalaenopsis* Indu Pramesi (Figures 1-3).



Fig. 1. Candidate Varieties of *Phalaenopsis* 1 (Puspita Devi Agrihorti)



Fig. 2. *Phalaenopsis* Varieties 2 (Ayu Pujiastuty Agrihorti)

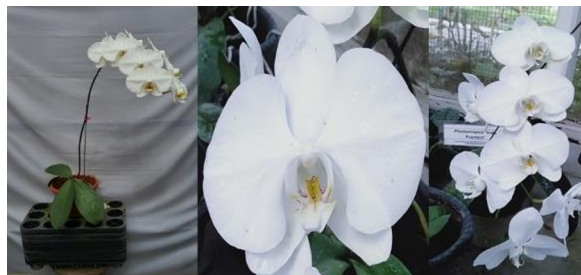


Fig. 3. *Phalaenopsis* Varieties 3 (Indu Pramesi)

The morphological data of candidate varieties and comparison varieties were presented in table form. The data of consumer preferences of *Phalaenopsis* orchids variety was analyzed quantitatively using the Pearson Chi-Square test [15], with the following formula:

$$X^2 = \sum_{n=1}^k \frac{(O_i - E_i)^2}{E_i} \quad (1)$$

X is the observed result; O is the number of observed frequencies in the i -th category and E expected number of frequencies in the i -th category. Observation frequency each attribute

is observation value of the attribute chosen by the respondent, whereas the expected observation frequency of each attribute is the expected value of each selected attribute.

Hypothesis:

H0 = Candidate Varieties of Phalaenopsis 1 (Puspita Devi Agrihorti) are less preferred than other varieties.

H1 = Candidate Varieties of Phalaenopsis 1 (Puspita Devi Agrihorti) are preferred over other varieties.

The decision-making conditions of this analysis are as follows:

- a. If Chi-Square Count < Chi-Square Table then H0 is accepted.
- b. If Chi-Square Count \geq Chi-Square Table then H0 is rejected.

3 Results and discussion

3.1 Respondents characteristic

Flowers are not a primary necessity like food, clothing, and shelter, but rather a secondary and tertiary requirement for many individuals. As a result, the majority of respondents were workers with a relatively fixed income, such as researchers, hobbyists, producers, decorative plant workers, and others. The majority of responses were female, with ages ranging from 31 to more than 50 years. Flowers are often preferred by women over men. Respondents of this age are typically employed and earning an income, allowing them to fulfill secondary or tertiary demands such as flowers and other attractive plants (Table 1). According to Alves et al.[16], awareness about floral qualities elements alter consumers' perceptions to try these non-traditional. There is a special bond between humans and flowers. Humans have always been drawn to flowers, despite their limited resources. Similarly, people have made efforts to nurture flowers for their aesthetic features [17].

Table 1. Characteristic of Respondent

| No. | Characteristic | Value | Percentage (%) |
|-----|-------------------|-------|----------------|
| 1. | Occupation | | |
| | a. Researcher | 62 | 28.7 |
| | b. Hobbies | 58 | 27.1 |
| | c. Producer | 11 | 5.1 |
| | d. General public | 84 | 39.1 |
| 2. | Sex | | |
| | a. Female | 128 | 59.5 |
| | b. Male | 87 | 40.5 |
| 3. | Age (Year) | | |
| | a. 20-30 | 11 | 5.1 |
| | b. 31-50 | 96 | 44.7 |
| | c. > 30 | 108 | 50.2 |

3.2. Consumer preferences of Phalaenopsis orchids variety

According to Rombach et al [18], intended adorn working spaces importance people worldwide. As one of the flowers, orchids are popular ornamental plants among consumers. The appealing shape and color of the flower is the key draw for customers, particularly enthusiasts. According to Kim & Lee [19] the freshness of flowers was the most essential element in consumer decisions to purchase cut flowers, regardless of place of origin. Phalaenopsis orchids are a popular type of orchid among amateurs. The comparatively large

size of the flower combined with a lovely dangling flower arrangement is highly appealing for decorating the room and yard. Almost all orchid enthusiasts are fascinated by this variety of orchid. Because *Phalaenopsis* species are so different, each with their unique set of benefits, everyone has their own favorite *Phalaenopsis* orchid. Orchid collectors in Indonesia gather a variety of indigenous and international *Phalaenopsis* orchid hybrids.

The candidate variety of *Phalaenopsis* Puspita Devi Agrihorti orchid cultivar was one of the hybrids introduced to respondents. As an orchid candidate variety has greater advantages than the other two orchid types utilized as comparison. The findings of studies conducted in DKI Jakarta and West Java demonstrate this. The candidate variety of Puspita Devi Agrihorti outperforms the other two *Phalaenopsis* orchid species. The plant appearance and flower pattern of candidate variety *Phalaenopsis* Puspita Devi Agrihorti were chosen as the first option by 35,9% of respondents based on the qualities examined. Similarly, when it came to number of flowers/stalks, (26,9%) of respondents selected "*Phalaenopsis* Puspita Devi Agrihorti)" as the preferred size, while 37,2% selected "*Phalaenopsis* Puspita Devi Agrihorti)" as the preferred number of flowers. The flower size of candidate variety of *Phalaenopsis* Puspita Devi Agrihorti" is 8.7-8.9 x 8.2-8.5 cm, the peduncle length is 50.6-88.2 cm, the peduncle diameter is 0.62-0.73 cm, the rachis length is 26.3-54.4 cm, and the number of flowers per peduncle is 9-20 flowers (Table 2).

Table 2. Respondent distribution of preferences of Candidate Variety and comparison variety

| Candidate Variety and comparison variety | Plant Appearance and Flower Pattern | | Peduncle length (PL), peduncle diameter (D) and rachis length (R) | | Number of flowers/stalks | | Total | |
|--|-------------------------------------|------|---|------|--------------------------|------|-------|------|
| | N | % | N | % | N | % | N | % |
| The candidate variety <i>Phalaenopsis</i> Puspita Devi Agrihorti | 139 | 35.9 | 104 | 26.9 | 144 | 37.2 | 387 | 60.0 |
| <i>Phalaenopsis</i> Ayu Pujiastuty | 29 | 24.6 | 66 | 55.9 | 23 | 19.5 | 118 | 18.3 |
| <i>Phalaenopsis</i> Indu Pramesti | 47 | 33.6 | 45 | 32.1 | 48 | 34.3 | 140 | 21.7 |
| Total | 215 | 33.3 | 215 | 33.3 | 215 | 33.3 | 645 | 100 |

According to the Chi Square test, the least expected count is 35,08, which is more than the X table (9,48773). And next, the Chi-Square test indicates the chi-square statistic has a p-value of .000, which is less than the alpha level of .05 (Table 3). As a result, there is sufficient evidence to reject the null hypothesis. The sample evidence indicates that there was a considerable variation in the distribution of preferences between the Candidate Variety and the comparison variety of *Phalaenopsis*. Candidate Varieties of *Phalaenopsis* 1 (Puspita Devi Agrihorti) were preferred over other varieties. The candidate variety *Phalaenopsis* Puspita Devi Agrihorti was selected for plant appearance and number of flowers/stalks. According to the research on consumer preferences for cut flower conducted in the USA, major product qualities include appearance, pricing, branding, product labeling, longevity, and country of origin [20]. Especially for *Phalaenopsis* orchids, according to Nurmalinda et al. [21], customer preferences for that flowers were round flower form, white hue, and >15 blossoms per stalk. When a large number of florets are combined, they can produce a beautiful arrangement to look at. Panelists preferred standard *Phalaenopsis* with striped flower patterns, while a bloom with no pattern (plain) was rated fairly ideal.

Table 3. Consumer's preference candidate variety of Phalaenopsis, n=215

| | Value | df | Asymptotic significant (2-side) |
|------------------------------|----------|----|---------------------------------|
| Pearson Chi Square | 497.446a | 4 | .000 |
| Likelihood ratio | 554.443 | 4 | .000 |
| Linear by linear association | 328.565 | 1 | .000 |
| N of Valid Cases | 645 | | |

3.3 Advantages of Phalaenopsis orchid flower candidate varieties compared to two other varieties

According to the findings, the candidate's variety *Phalaenopsis* Puspita Devi Agrihorti for release have additional benefits such as: leaf length, leaf width, number of leaves, lip length, flower stalk length and diameter, rachis length, and number of flowers. It also outperforms the two orchid kinds selected as comparisons in terms of leaf length, leaf width, number of leaves, lip length, flower stalk length and diameter, rachis length, and number of flowers. Although the length and diameter of those flowers were smaller than those of the comparative types, the candidate variety's exquisite blossom pattern compensated for its limitations (Table 4).

Table 4. The quantitative characteristics of candidate and comparison types of Phalaenopsis

| No. | Description | Phalaenopsis Ayu Pujiastuty Agrihorti | Candidate varety Phalaenopsis Puspita Devi Agrihorti | Phalaenopsis Indu Pramesi |
|-----|-------------------------------|---------------------------------------|--|---------------------------|
| 1. | Age at flowering (month) | - | 27-30 | |
| 2. | Leaf length (cm) | 21.2 – 23.7 | 25 – 27.3 | 22 – 27 |
| 3. | Leaf width (cm) | 8.2 -8.5 | 13.1 – 14 | 7.2 – 7.5 |
| 4. | Number of leaves (blade) | 4 – 5 | 5 – 8 | 4 – 6 |
| 5. | Flower length (cm) | 8.3 – 9.2 | 8.7 – 8.9 | 9.8 – 10.8 |
| 6. | Flower width (cm) | 9.8 10.2 | 8.2 – 8.5 | 9.2 -9.8 |
| 7. | Lip length (cm) | 2.2 – 2.3 | 2.7 – 2.8 | 2.3 – 2.6 |
| 8. | Lip width (cm) | 2.3 – 2.5 | 1.4 – 1.6 | 1.7 – 1.9 |
| 9. | Flower stalk length (cm) | 4.24 – 72 | 50.6 – 88.2 | 50.0 – 55.7 |
| 10. | Diameter of flower stalk (mm) | 0.5 – 0.63 | 0.62 – 0.73 | 0.60 – 0.70 |
| 11. | Rachis length (cm) | 28.0 – 40.9 | 26.3 -54.5 | 30.0 – 33.4 |
| 12. | Number of florets/stalks | 9 – 19 | 9 – 20 | 8 – 12 |
| 13. | Number of stalks/plants | 1 | 1 | 1 |
| 14. | Length of flower freshness | 3 – 4 | 3 – 4 | 3 - 4 |

Based on BSN [13] candidate variety of Phalaenopsis Puspita Devi Agrihorti was of quality class I, with a plant age of 27-30 months, 5-8 leaves, and 9-20 flowers/stalk (Table 5). This means that the Phalaenopsis orchid candidate varieties are ready to be released as new Phalaenopsis orchid varieties.

Table 5. The quality standards for Phalaenopsis orchid hybrids.

| Parameters | Unit | Quality grade | | | |
|-------------------|---------|---------------|-----------|---------|---------|
| | | Super | I | II | III |
| Plant age | Month | > 30 | 22 – 30 | 22 – 30 | 22 – 30 |
| Number of leaves | Strands | ≥ 8 | 4 – 6 | 4 – 6 | 3 |
| Number of florets | Florets | ≥ 15 | 11 - ≥ 15 | 6 – 10 | 6 - 10 |

Source: [15]

4 Conclusion

From the results of the study, there is sufficient evidence to reject H₀ and accept H₁ (candidate varieties of Phalaenopsis 1 (Puspita Devi Agrihorti) are preferred over other varieties). There is a considerable variation in the distribution of preferences between the candidate variety and the comparison variety of Phalaenopsis. The variety candidate Phalaenopsis Puspita Devi Agrihorti meets the requirements to be released as a new variety due to its superiority in terms of plant appearance and number of flowers per plant compared to the two comparators. The existence of orchids can reduce our dependence on Phalaenopsis orchid varieties from abroad.

References

1. K. T. Hsieh, S. H. Liu, I. W. Wang, and L. J. Chen, *Bot. Stud.*, **61**, 1 (2020).
2. A. Wibowo, I. G. Tirta, and I. N. Peneng, *J. Appl. Environ. Biol. Sci.* **5**, 1 (2015)
3. M. F. Fay, *Undocumented trade in species of orchidaceae*, [Online]. Available: http://www.wwf.org.uk/wwf_articles.cfm?unewsid=1286; (2023)
4. M. A. Romadlon, F. A. Zahra, G. D. Nugroho, and A. Pitoyo, *Biodiversitas*, **22**, 1996 (2021)
5. V. Agustini, L. Zebua, and N. Wenda, *Biodiversitas*, **17**, 304 (2016)
6. A. R. Warghat, P. K. Bajpai, R. B. Srivastava, O. P. Chaurasia, and H. Sood, *Sci. Hortic. (Amsterdam)*, **164**, 448 (2013)
7. D. Riniarsih, *Outlook Anggrek*, Pusat Data dan Sistem Informasi Pertanian Sekretariat Jenderal Kementerian Pertanian, (2020)
8. Y. Mayett-Moreno, J. S. Popp, M. Sabogal-Salamanca, S. Rodríguez-Piñeros, E. Salomé-Castañeda, and D. A. Flores-Alonso, *Sustain.*, **10**, 2 (2018)
9. H. Jeong, J. Bin Jeon, S. Y. Kim, and W. Oh, *J. Bio-Environment Control*, **30**, 66 (2021)
10. S. W. Gale, G. A. Fischer, P. J. Cribb, and M. F. Fay, *Bot. J. Linn. Soc.*, **186**, 425 (2018)
11. F. Yani and T. Supriana, *IOP Conf. Ser. Earth Environ. Sci.*, **122**, 1 (2018)
12. N. Anggraeni, *Analisis perilaku konsumen dalam pembelian anggrek secara online dan offline*, Universitas Muhammadiyah Malang, (2023)
13. BSN, *Anggrek pot Bagian 2 : Phalaenopsis hibrida*. Jakarta: BSN, (2014).
14. S. Kartikaningrum, M. Wegadara, and R. Soehendi, *Panduan Karakterisasi Tanaman Hias*, Balai Penelitian Tanaman Hias (2016)
15. N. Setiawan, “Statistika Nonparametrik Untuk Penelitian Sosial Ekonomi Peternakan,” http://pustaka.unpad.ac.id/wp-content/uploads/2009/03/statistika_nonparametrik.pdf. (2018)
16. L. C. Alves, V. Sant’Anna, E. Biondo, and A. Hoppe, *Research, Society and*

Development, **10**, 1 (2021)

17. E. Huss, K. B. Yosef, and M. Zaccai, *Behav. Sci.*, **8**, 1 (2018)
18. M. Rombach, N. Widmar, E. Byrd, and V. Bitsch, *Int. J. Retail Distrib. Manag.*, **46**, 561 (2018)
19. H. K. Kim and A. K. Lee, *Horticulturae*, **7**, 2 (2021).
20. A. L. Rihn, C. Yue, C. Hall, and B. K. Behe, *HortScience*, **49**, 769 (2014)
21. Nurmalinda, S. Kartikaningrum, N. Q. Hayati, and D. Widyastoety, *J. Hort.*, **21**, 383 (2011)
22. Sabran, B. *Prinsip-prinsip pemasaran. Jilid 1*. Jakarta: Erlangga. (2008)