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Meta Analysis of Morphological Charteristics of Local Durian (Durio SPP)

[1]Hajar Setyaji, [2]Metha Monica
[1]Agricuture, Jambi University, [2]Animal Husbandry, Jambi University

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ABSTRACT
The durian plant is a native Indonesian plant that produces fruit that is very popular with the public because of its distinctive taste, aroma and texture of the pulp. The high demand for superior durian fruit is a challenge because of the high variation in the quality of durian fruit. The meta-analysis of the morphological character of durian plants aims to provide an overview of the distribution of the morphological study of local durian plants. The research method was carried out by conducting research on the morphology of durian plants using the keyword google search engine by limiting it to journals written by Indonesians, selecting, and extracting related morphological parameters and analyzing them qualitatively. The results of the study showed that the morphology of durian fruit received the first priority, followed by durian leaves and seeds. Conclusion The morphology of local durian plants as a first step in finding superior durian seedlings still shows the diversity of measurements of morphological characteristics.

Corresponding Author:
Hajar Setyaji,
Agricuture, Jambi University
hajarsetyaji@unja.ac.id

INTRODUCTION

The durian plant *(Durio spp)* belongs to the malvaceae family, is a high-level plant with a relatively high species diversity estimated at 30 species. Durian is known as a native Malay plant, which is spread starting from India, Sri Lanka, Myanmar, Thailand, Cambodia, Vietnam, Malaysia and Indonesia [1] In Indonesia there are 20 species, 18 species in Kalimantan, 7 species in Sumatra, 1 species in Java, 1 species in Bali, 1 species in Sulawesi, and one species in Maluku [2]. Durian fruit is a fruit that is very popular with the community because of its distinctive taste, aroma and texture and has high economic value, the demand for superior durian fruit is constantly increasing from time to time.

The high demand for superior durian fruit creates opportunities for efforts to meet the demand for durian fruit, which has implications for efforts to improve durian plant cultivation. Most of the durian trees in Indonesia today come from seeds, according to [3], the new durian plant will produce fruit for a long time, ranging from 7 to 10 years, durian plants derived from new seeds will bear fruit at the age of 8 to 10 years, while vegetative propagation of durian plants will bear fruit faster, namely 4 to 5 years. The use of vegetative durian seedlings will produce high-quality fruits. The high diversity of durian plants is due to cross-pollination and in general, durian plants are propagated through seeds.

The high diversity of durian plants causes diverse fruit quality, so that under certain conditions it will be detrimental to consumers who like eat durian fruit. Efforts to obtain

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superior types of durian continue to be pursued through various ways starting from the morphological characterization of durian plants. The meta-analysis study of the morphological character of durian plants aims to provide an overview of the distribution of local durian plant morphological studies which generally vary between ones researcher and another researcher so that by knowing the distribution of morphological studies of durian plants will increase efforts to uniformize the morphological character of durian plants.

METHODS

The research was carried out based on the formulation of research questions, inclusion and exclusion criteria base on [4], and continued with a search using the google.com search engine, then the data obtained was viewed and selected based on the title and abstract of the research according to Figure 1. Data collected from October to November 2024

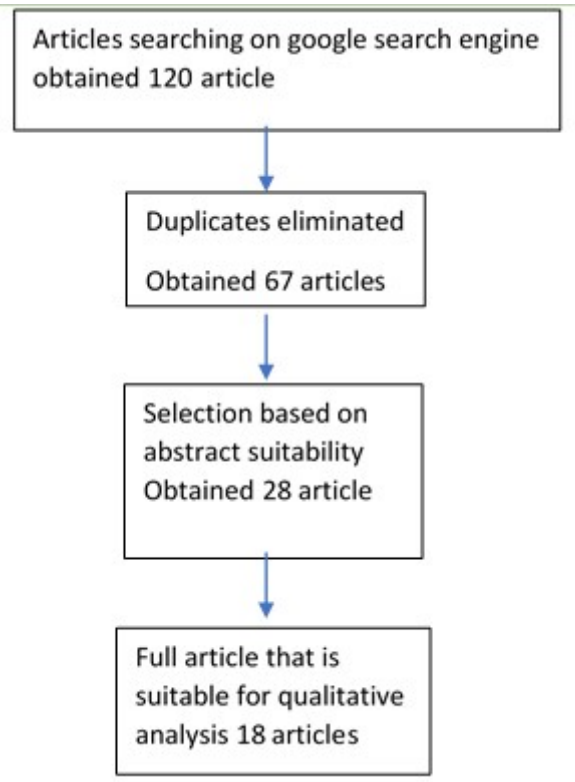

Figure 1 Flowchart of the research

RESULTS AND DISCUSSION

Leaf morphology

There are 18 articles that discuss the morphology of durian plants, the morphological characteristics of durian plants are the most studied in this research research, morphological characters are considered to be the characteristics of durian types so that they can determine the superior durian types that are developed. The morphological characteristics of the leaves include leaf shape, leaf length, leaf width, leaf base, leaf tip, leaf color and leaf edges scattered in figure 2

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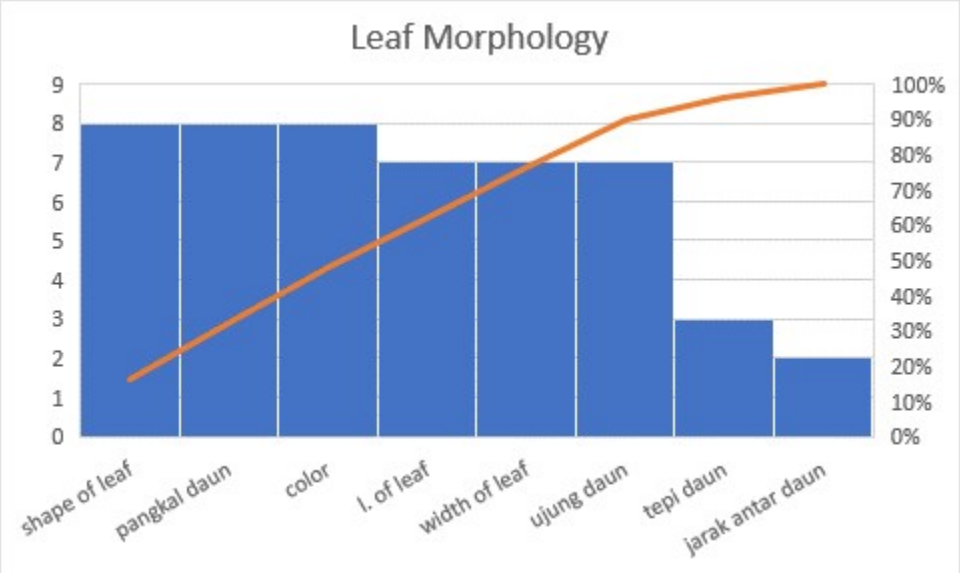

Figure 2 Morphological Characteristics of Durian Leaves

From the results of the morphological characteristics of durian leaves dominated by the parameters of leaf shape, leaf base and leaf color are published in 8 articles, respectively, 7 articles display the parameters of leaf length, leaf width and leaf tip, 3 articles display leaf edges, and two articles display the parameters of the distance between leaves. Leaf morphology has a high contribution to the cumulative diversity[5].

The shape of the leaves associated with photosynthesis is very diverse in relation to environmental adaptations of cellular structures and physiological responses, but wide leaves generally receive more sunlight [6] and [7]. The shape of the leaf is related to the palisade cell column plays a role in increasing light absorption and photosynthesis efficiency [8]. The shape of durian leaves varies including elliptical/oval [9], [10], [11], [12] [13], square, round long, ellipse [14], oblong [13][15], Linear-oblong, Ovate [13]. oblong, ovate, dan elliptic [16]. The tips of the leaves are acuminate, the base of the leaves is round and cuneate, the texture is smooth, the color of the upper leaves is light green and dark green [17], the base of the leaves is obtuse [13].

Research on the morphological parameters of durian fruit obtained prominent properties, found (16) articles on fruit shape, flesh color (13), skin color (12), fruit fleshy aryl thickness (12) taste (11), fruit diameter (10), fruit length (10), number of carpal (8), fruit base (6), fruit tip (6), texture (6), fruit stalk (5), aroma (5), fruit weight (4), fruit width (4), skin thickness (4), thorn length (3), fruit weight (3) articles in scattered on Figure 3.

The morphological characteristics of durian fruit recorded in this study have 18 morphological parameters, the number of morphological parameters of durian fruit shows the attention of researchers in assessing the fruit. The shape of durian fruits detected Oblate, Globose, Oblong, Elliptic, Obovoid dan Ovoid [13]. Fruit fleshy thickness with 28 to 30 % is suitable for entering durian festival [18]. The parameters of the morphological parameters of durian fruit are the main characteristics that affect the genetics relationship including fruit length, diameter and seed weight [19].

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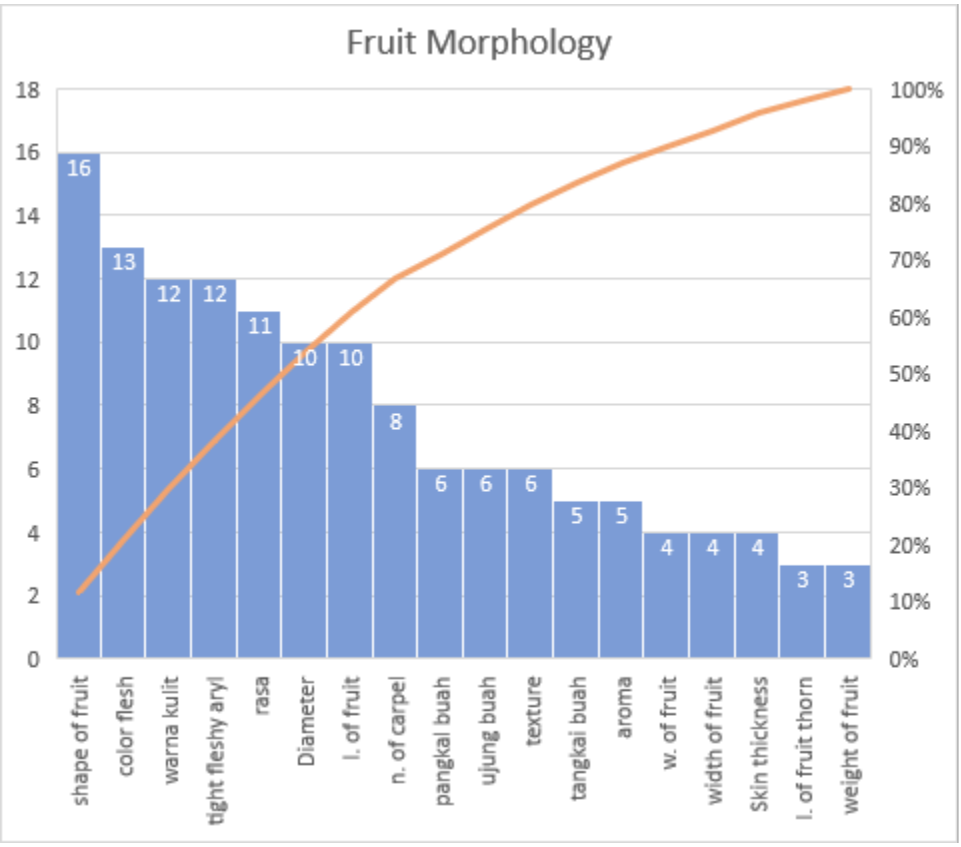

Figure 3 Fruit Morphology

Seeds Morphology

Based on the results of the search for the morphology of durian fruit seeds, the parameters of seed color and seeds shape (11), seed length (7), seed width (4), seed diameter (4), number of perjuring seeds, whole (3), deflated seeds (3), number of perjuring seeds (3) articles as seen in Figure 4.

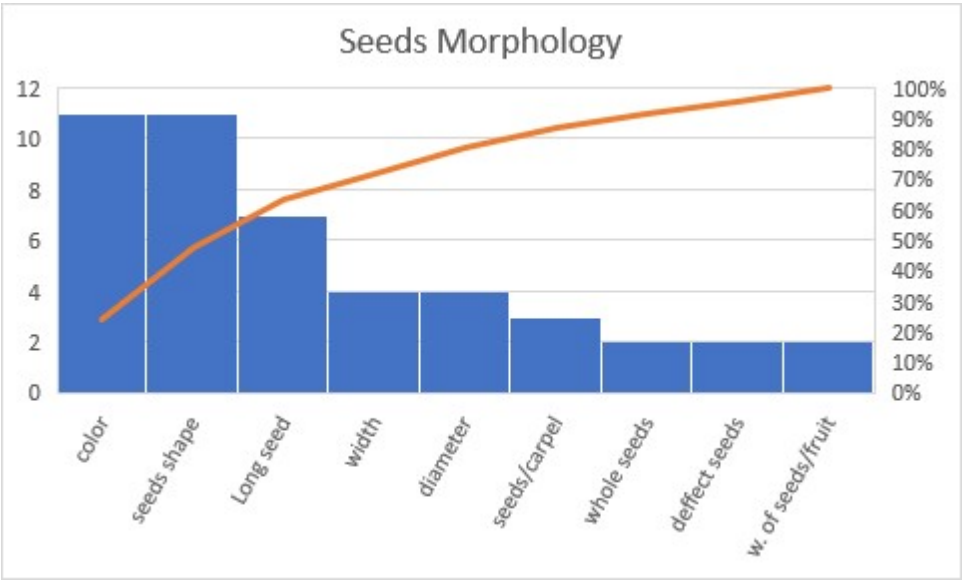

Figure 4 Seeds Morphology

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Durian seeds are genetic material that plays an important role in the continuation of genetic traits, the researcher's attention is focused on the shape, followed by length, width and diameter, then followed by the color of the seeds and the number seeds/carpel, and the appearance of the seeds, namely whole seeds, deflated seeds and weight of seeds / carpel

Intact seeds and perfect appearance shows that durian seeds have the potential to germinate well. Durian seeds will soon grow in a few days because they are recalcitrant fruits that do not have a seed dormancy period. Durian seeds stored for 4 months have greatly decreased their germination power, even the seeds all die as shown by [20] Sudarmono et.al test results. (2023), in two experiments, D. dulcis durian seeds 0%, D kutejensis 7% ± 1.4, and 0%, D. oxleyanus 1% and 0% and D. zibethinus 21±26.2% and 58±2.8%

In contrast to deflated fruits that show that the seed endosperm does not develop properly so that it is difficult to germinate. In terms of fruit quality, small durian seeds, deflated in large quantities are highly sought after by consumers because they are considered to have high quality because deflated seeds will increase the proportion of edible fruit.

CONCLUSION

The morphology of local durian plants as a first step in finding superior quality of fruits, durian seedlings still shows the diversity of measurements of morphological characteristics..

REFERENCES

[1] C. Thorogood *et al.*, “The king of fruits,” *Plants, People, Planet*, vol. 4, Dec. 2022, doi: 10.1002/ppp3.10288.

[2] Sundari, Mas’ud A, Arumingtyas EL, Hakim L, Azrianingsih R, and Wahyudi D, “Taxonomical Status of Local Durian (Durio spp) From Ternate Island North Maluku Base on Morphological Character and Geographical Factors,” *Int. Journal of Conserv. Sci.*, vol. 10, no. 4, pp. 711–720, 2019.

[3] T. Uji, “Keanekaragaman Jenis dan Sumber Plasma Nutfah Durio (Durio spp.) di Indonesia,” 2005.

[4] G. M. Tawfik *et al.*, “A step by step guide for conducting a systematic review and meta-analysis with simulation data,” *Tropical Medicine and Health*, vol. 47, no. 1. BioMed Central Ltd., Aug. 01, 2019. doi: 10.1186/s41182-019-0165-6

[5] Susilawati and Sabran M, “Karakterisasi Morfologi Durian (Durio zhibetinus) Lokal Asal Kabupaten Katingan (Morphological Characterization of Local Durian [Durio zhibetinus] from Katingan Regency).”

[6] H. Tsukaya, “A Consideration of Leaf Shape Evolution in the Context of the Primary Function of the Leaf as a Photosynthetic Organ: Including Bioenergy and Related Processes,” 2018, pp. 1–26. doi: 10.1007/978-3-319-93594-2_1

[7] A. Leigh, R. Hill, and M. C. Ball, “Leaf shape influences spatial variation in photosynthetic function in Lomatia tinctoria,” *Functional Plant Biology*, vol. 41, no. 8, pp. 833–842, 2014, doi: 10.1071/FP13334.

[8] E. Gotoh, N. Suetsugu, T. Higa, T. Matsushita, H. Tsukaya, and M. Wada, "Palisade cell shape affects the light-induced chloroplast movements and leaf photosynthesis," *Scientific Reports*, vol. 8, no. 1, Dec. 2018, doi: 10.1038/s41598-018-19896-9.

[9] S. S. Tan, "Keragaman Durian (Durio Zibenthimus Murr) Lokal Indonesia Dengan Kasus Durian Orange dan Buntat Ali," 2022. [Online]. Available: http://ejournal.urindo.ac.id/index.php/pertanian

[10] Jasminarni, T. Novita, and D. Evita, "Publisher by : Program Studi Agroteknologi Fakultas Pertanian Universitas Batanghari Identifikasi Karakter Morfologi Tanaman Durian (Durio zibethinus Murr) Lokal Kerinci," *Jurnal Media Pertanian*, vol. 8, no. 1, pp. 45–49, 2023, doi: 10.33087/jagro.v8i1.181.

[11] H. F. Rohman, G. F. Dinata, R. R. D. Pertami, F. Rohman, and E. Suprayitno, "Studi Karakteristik Morfologi Durian (Durio zibethinus Murr.) Lokal di Kecamatan Sukorambi, Kabupaten Jember," *Agropross : National Conference Proceedings of Agriculture*, pp. 267–273, Sep. 2023, doi: 10.25047/agropross.2023.467.

[12] R. A. Mudaffar, "KARAKTERISTIK MORFOLOGI DURIAN (Durio zibethinus) LOKAL MALAMBAN DAN MANONTO DI DESA MALIMBU KECAMATAN SABBANG KABUPATEN LUWU UTARA," *Jurnal Pertanian Berkelanjutan*, vol. 11, no. 1, 2023

[13] B. Perdana, Mustikarini ED, and Prayoga, "Diversity of Durian Germplasm (Durio zibethinus Murr) In Bangka Island," *Enviagro, Jurnal Pertanian dan Lingkungan*, vol. 10, no. 1, pp. 33–43, Apr. 2024.

[14] N. Pratiwi, D. S. Hanafiah, and L. A. M. Siregar, "Identifikasi Karakter Morfologis Durian(Durio Zibethinus Murr) di Kecamatan Tiga lingga dan Pegagan Hilir Kabupaten Dairi Sumatera Utara," Jurnal *Agroekoteknologi FP USU*, vol. 6, no. 2, pp. 200–208, 2018.

[15] N. Hariani, Purwasih, and Syafrizal, "Studi Karakterisasi Dan Persebaran Durian Lahung (Durio dulcis Becc.) Di Kecamatan Damai Dan Nyuatan Kabupaten Kutai Barat," *Jurnal Bioterdidik: Wahana Ekspresi Ilmiah*, pp. 77–87, Apr. 2020.

[16] C. D. Y. Christie and N. A. Lestari, "ANALISIS MORFOLOGI DAN KEKERABATAN DURIAN LOKAL DI JAWA TIMUR," *Agriovet*, vol. 2, no. 2, pp. 37–48, 2020.

[17] E. Yuniastuti, N. Nandariyah, and S. R. Bukka, "Karakterisasi Durian (Durio zibenthinus) Ngrambe di Jawa Timur, Indonesia," *Caraka Tani: Journal of Sustainable Agriculture*, vol. 33, no. 2, p. 136, Sep. 2018, doi: 10.20961/carakatani.v33i2.19610.

[18] R. S. Handayani and Ismadi, "Analisis Keragaman Kualitas Buah Durian Unggulan (Durio zibethinus) Aceh Utara Analysis of North Aceh Superior Durian (Durio zibethinus) Quality," *J. Hort. Indonesia*, vol. 8, no. 3, pp. 147–154, 2017.

[19] S. Sudarmono *et al.*, "Endangered Durio spp. conservation and seed germination in Indonesia," *Forest* Science *and Technology*, vol. 19, no. 2, pp. 89–95, 2023, doi: 10.1080/21580103.2023.2177356.

[20] M. A. Sihaloho, D. S. Hanafia, E. Julianti, and M. Basyuni, "Morphological Characters of Local Origin Durian (Durio zibethinus Murr.) Fruits and Seeds from Central Tapanuli Regency, North Sumatra, Indonesia," *International Journal on Advanced Science, Engineering and Information Technology*, vol. 11, no. 1, pp. 213–222, 2021, doi: 10.18517/ijaseit.11.1.11211.