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Flower Variations In Mount Gede Pangrango National Park Area

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Abstract:
Background*: The aesthetic value in flowers is the result of the visual beauty, harmony of shape, color, texture, and fragrance possessed by the flower. Flowers are one of the attractions that are considered to have aesthetic value or beauty. Mount Gede Pangrango National Park is one of the mountains visited by many climbers because there are many tourist destinations that can be visited in the TNGGP area. Flower plants found in the National Park area have several special characteristics that reflect their adaptation to their natural environment, the beauty of flowers is often considered an important factor in the beauty of plants and the environment, as well as being a human preference in choosing ornamental plants or visiting tourist attractions. For this reason, this study was conducted with the aim of analyzing and knowing the variations in the types of flower plants in the Mount Gede Pangrango National Park area.*
Materials and Methods*: This study was conducted in Sukabumi, covering parts of the Mount Gede Pangrango National Park and along roads with flowers in the Sukabumi area. The study was conducted from April to July 2023. This study used an exploratory method to determine the location of golden ratio in flowers in Sukabumi and surrounding areas by observing, measuring, and documenting flowers at the research site. There were 150 flowers used as research objects with research data collected including primary and secondary data.*
Results*: The results of flower research based on family, showed that the family with the most flowers found in this study were Apocynaceae as many as 11 species, Asteraceae as many as 10 species, and Acanthaceae as many as 9 species. The results of this study indicate that all the flowers studied contain a gold ratio number of 1.618 or a number close to the gold ratio in the range of 1.612-1.633.*
Conclusion: *The golden ratio value of flowers in the Mount Gede Pangrango area found 9 different variations from 62 types of flowers found in the comparison between morphology. The most golden ratio data were found in the comparison between the total area of each flower and the area of some flowers and also the comparison between the length and width of the crown of each flower.*
Key Word*: Flower; Gold ratio; Mount Gede Pangrango National Park; Variation.*

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I. Introduction

The aesthetic value of flowers is the result of the visual beauty, harmony of shape, color, texture, and fragrance of the flowers. The aesthetics of flowers can also be perceived through the combination of these elements with a deep context, such as the arrangement of flowers in a garden, floral arrangements, floral paintings, or the use of flowers in decorative arts. Flowers are often found in some tourist attractions as one of the attractions utilized in art, design, decoration, as well as in meditation and therapeutic practices due to their strong aesthetic value and their effect that can enhance positive atmosphere and feelings for individuals. One form of positive imagery that can attract tourists to visit is photography and *floratherapy* is the use of flowers and their scents to improve mental health and well-being. This can involve using flowers in natural remedies, such as aromatherapy, or as part of relaxation and meditation therapies. Flowers are one of the attractions that are considered to have aesthetic value or true beauty. In line with the opinion of Chan (2015) which states that the attractive nature of flowers has beauty, it is conveyed by Hula and Flegr (2016) who in their research show evidence that many people such as apartment and garden owners, horticulturists strive to grow new types of ornamental flower plants, and also those used as motifs in paintings, fabrics, porcelain, or jewelry.

Mount Gede Pangrango National Park is a mountain that is visited by many climbers because there are many tourist destinations that can be visited in the TNGGP area. To climb the Mount Gede Pangrango area, the

management provides three hiking trails including the Cibodas hiking trail, the Putri hiking trail and the Selabintana hiking trail, but the Selabintana trail has been closed by the TNGGP area manager. On the way to the Mount Gede Pangrango area, every visitor will find various types of plants that usually grow wild along the road. Cibodas Biosphere Reserve includes the core area of Mount Gede Pangrango National Park (TNGGP) and buffer zone in three districts namely Bogor Regency, Cianjur Regency and Sukabumi Regency. The buffer zone certainly has different types and characteristics of flowers, in this case in the Sukabumi district area.

Flower plants found in the National Park have some special characteristics that reflect their adaptation to their natural environment. Several studies have been conducted to determine human preferences for the beauty of flowers compared to other plant parts. A study explained that the colors on the flowers and leaves were more attractive to respondents than the colors on the stems or other parts (Rifai *et al*. 2014). Other research on analyzing visual preferences of landscape *planting* also shows that the presence of flowers can increase the impression of beauty in the landscape (Nabilah, 2021). Therefore, the beauty of flowers is often considered an important factor in the beauty of plants and the environment, as well as being a human preference in choosing ornamental plants or visiting tourist attractions. For this reason, this research was conducted with the aim of analyzing and knowing the characteristics of flower plants in the Mount Gede Pangrango National Park area.

Many National Parks have flower plants that are endemic species, meaning they can only be found in certain regions and nowhere else in the world. Flower plants in national parks have evolved to adapt to typical environmental conditions. They may have specialized mechanisms to survive in certain climates, such as tolerance to heavy rainfall, dry soil conditions or extreme temperature changes. Flower plants in national parks play an important role in maintaining biodiversity and natural beauty. Therefore, efforts to protect and sustain these plants are essential in maintaining a healthy and sustainable ecosystem in the National Park.

II. Material And Methods

This research was conducted in Sukabumi which includes part of Mount Gede Pangrango National Park and along a road overgrown with flowers in the Sukabumi area. The research will be conducted in April-July 2023.

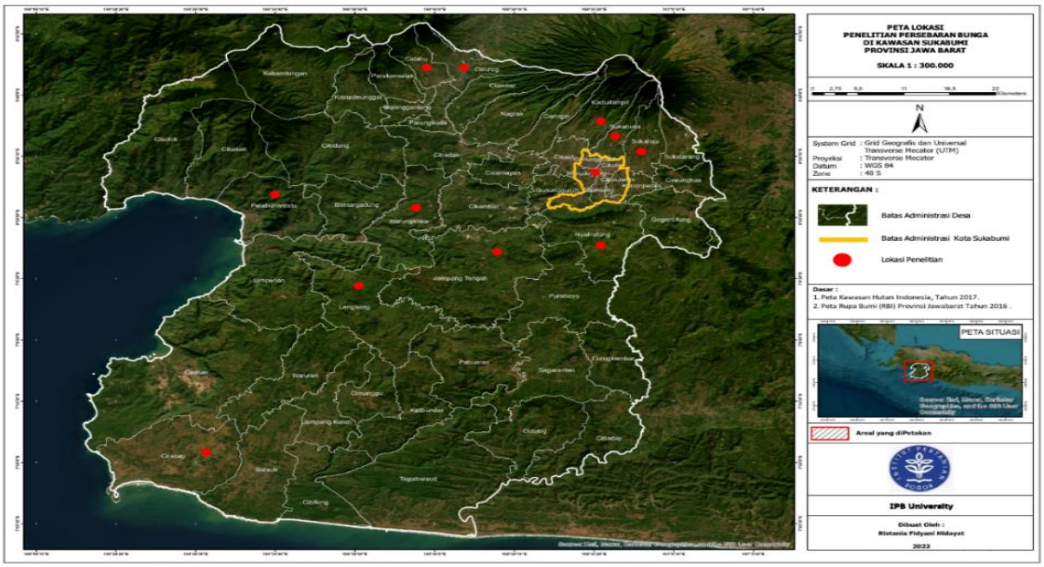

Figure 1. Research locations

Procedure methodology

This research uses an exploratory method that aims to determine the location of the *golden ratio* of flowers in Sukabumi and surrounding areas by observing, measuring, and documenting flowers at the research site. A quantitative approach is used to measure and analyze in order to obtain a comparison that results in a *golden ratio* value on interest in the Sukabumi region. Samples are taken by *the Purposive Sampling* method, which is the selection of samples based on certain criteria. The criteria in this study are various types of flowers with similar research that has been done previously in the Bogor region, Indonesia. There were 150 flowers that were used as objects in this study. The research data collected includes primary and secondary data. Secondary data were obtained by conducting a literature study related to flowers grown at the research site including taxonomy as a basis for categorizing flowers by family. After obtaining secondary data, primary data is then collected by collecting flower sizes and documenting flowers visually. Pcollection of secondary data through literature studies related to flowers growing in the Sukabumi region. The study of literature serves as a basis for

identifying the types of flowers that will be the object of study, taxonomy is used as a basis for categorizing flowers by family. The information obtained from the study of the literature makes it possible to comprehensively understand the characteristics of each flower family, including common features and characteristics. After collecting secondary data, the next stage is to collect primary data.

Statistical analysis

The collected data were then converted into digital form to facilitate researchers in analyzing the *golden ratio* proportion. The *golden ratio* calculation was carried out by observing the morphology of each flower, including comparing the width and height of the petals, as well as the overall size of the flower measured using a caliper, while pictures of the flowers were taken using a camera. These measurements were then compared using the golden ratio formula. In this study, flowers were considered to have a golden ratio if the measurements of height, length, width, and area of the object could be divided to produce numbers close to 1.618 and 0.618. The golden ratio is defined as the result of dividing the sum of two numbers (e.g., a + b) divided by the larger number (b) which is equal to the result of dividing the larger number (b) by the smaller number (a) (Benjafield & Davis 1978; Green 1995). The applications used to analyze the data in this study were *Adobe Photoshop* and *ImageJ*. *Adobe Photoshop was* used to visualize the size and location of the golden ratio in the flowers. The tools used in *Adobe Photoshop* are ruler and line tools. The ruler is used to see the measurement results on the object while the line tool is used to provide a visual representation of the size and location of the golden ratio of the flower. *ImageJ is* used for the results that will be generated in the form of a comparison of the flower area.

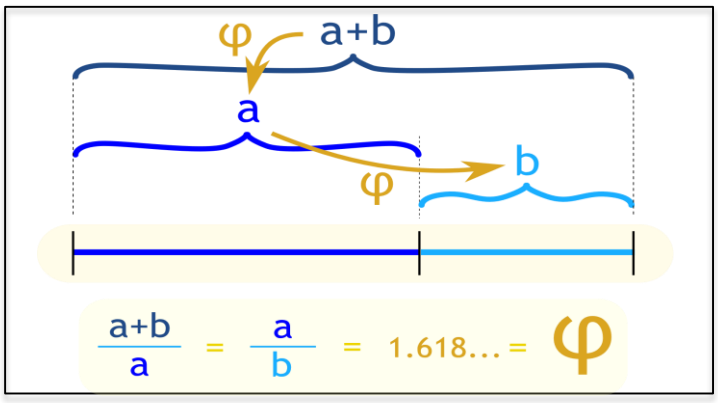

Figure 2. Golden Ratio Formula

III. Result

Based on the data obtained in (Table 1) the list of flowers based on the family, shows the family with the most flowers found in this study are Apocynaceae as many as 11 species, Asteraceae as many as 10 species, and Acanthaceae as many as 9 species. The results showed that all the flowers that have been studied contain a gold ratio number of 1.618 or a number close to the gold ratio in the range of 1.612-1.633.

Table 1. List of Flowers Research Results

No	Flower Family	Flower Species
1	Acanthaceae	*Barleria lawii, Dicliptera tinctoria, Pseuderanthemum variabile, Ruellia tuberosa, Strobilanthes hamiltoniana, Strobilanthes reptans, Strobilanthes sp, Thunbergia alata, Thunbergia natalensis*
2	Alismataceae	*Echinodorus cordifolius, Sagittaria latifolia*
3	Amaranthaceae	*Alternanthera philoxeroides*
4	Amaryllidaceae	*Clivia miniata, Crinum moorei, Hippeastrum aulicum, Nothoscordum bivalve, Tulbaghia violacea, Zephyranthes rosea*
5	Apocynaceae	*Adenium obesum, Asclepias curassavica, Calotropis gigantea, Cascabela thevetia, Catharanthus ovalis, Cerbera odollam, Kopsia fruticosa, Nerium oleander, Strophanthus gratus, Tabernaemontana Africana, Wrightia reliosa*
6	Asparagaceae	*Maianthemum trifolium*
7	Asphodeloideae	*Dianella caerulea, Hemerocallis envious*
8	Asteraceae	*Cosmos sulphureus, Galinsoga parviflora, Lapsanastrum humile, Montanoa bipinnatifida, Stokesia laevis, Symphyotrichum novae-angliae, Symphyotrichum pilosum, Synedrella nodiflora, Tagetes patula, Taraxacum officinale*
9	Balsaminaceae	*Impatiens glandulifera*
10	Bignoniaceae	*Mansoa alliacea, Pandorea jasminoides, Tabebuia aurea*
11	Brassicaceae	*Brassica rapa*
12	Bromeliaceae	*Tillandsia guatemalensis*

13	Campanulaceae	*Lobelia brevifolia*
14	Cannaceae	*Canna paniculata*
15	Capparaceae	*Cleome rutidosperma*
16	Caryophyllaceae	*Dianthus barbatus*
17	Commelinaceae	*Commelina diffusa, Dichorisandra thyrsiflora, Tradescantia pallida, Tradescantia zebrina*
18	Convolvulaceae	*Evolvulus nuttallianus, Ipomea mauritiana, Ipomoea pes-caprae, Ipomoea purpurea, Ipomoea quamoclit, Ipomoea triloba*
19	Costaceae	*Cheilocostus speciosus, Costus afe Ker Gawl*
20	Crassulaceae	*Kalanchoe blossfeldiana*
21	Cucurbitaceae	*Cucurbita maxima, Momordica charantia, Sechium edule*
22	Ericaceae	*Rhododendron concina, Rhododendron macgregoriae, Rhododendron mucronatum, Rhododendron simsii*
23	Euphorbiaceae	*Cnidoscolus aconitifolius*
24	Fabaceae	*Arachis duranesis, Bauhinia variegate, Centrosema pubescens, Centrosema virginianum, Crotalaria pallida, Erythrina crista galli, Macroptilium lathyroides, Senna petersiana*
25	Geraniaceae	*Pelargonium inquinans*
26	Gesneriaceae	*Chrystothemis pulchella, Cyrtandra picta, Episcia cupreata*
27	Goodeniaceae	*Scaevola taccada*
28	Hydrangeaceae	*Hydrangea macrophylla*
29	Iridaceae	*Iris domestica, Trimezia steyermarkii*
30	Lamiaceae	*Clerodendrum nutans, Clerodendrum quadriloculare, Marsypianthes chamaedrys, Rotheca serrata, Salvia coccinea*
31	Linderniaceae	*Lindernia antipoda*
32	Lythraceae	*Lagerstroemia speciosa*
33	Malpighiaceae	*Galphimia glauca*
34	Malvaceae	*Dombeya wallichii, Hibiscus radiatus, Sida acuta, Sida rhombifolia, Taliparitiliaceum*
35	Melastomataceae	*Miconia crenata, Pleroma semidecandrum*
36	Muntingiaceae	*Muntingia calabura*
37	Myrtaceae	*Psidium guajava*
38	Nyctaginaceae	*Mirabilis jalapa*
39	Nymphaeaceae	*Nymphaea nouchali*
40	Oleaceae	*Jasminum coarctatum*
41	Onagraceae	*Ludwigia peruviana*
42	Orchidaceae	*Dendrobium crumenatum, Dendrobium spathilingue, Epidendrum radicans, Trichocentrum cavendishianum*
43	Oxalidaceae	*Oxalis barrelieri, Oxalis debilis*
44	Plantaginaceae	*Narrowleaf angelon*
45	Plumbaginaceae	*Plumbago auriculata*
46	Portulacaceae	*Portulaca grandiflora, Portulaca umbraticola, Portulaca villosa*
47	Primulaceae	*Ardisia elliptica*
48	Rosaceae	*Rhaphiolepis indica, Rubus rosifilius*
49	Rubiaceae	*Cephaelis ipecacuanha, Hedyotis, Ixora coccinea, Ixora crimson star, Ixora siamensis, Mussaenda erythrophylla, Mussaenda philippica, Richardia scabra, Serissa japonica*
50	Rutaceae	*Citrus limon, Ravenia spectabilis*
51	Solanaceae	*Browallia americana, Brunfelsia latifolia, Brunfelsia pauciflora, Cestrum aurantiacum, Petunia atkinsia, Petunia axillaris, Solanum melongena, Solanum torvum*
52	Theaceae	*Camellia sasanqua*
53	Turneraceae	*Turnera subulata*
54	Verbenaceae	*Congea tomentosa*
55	Zingiberaceae	*Kaempferia pulchra*

Based on the data on flower shapes that have been obtained, it is known that flowers often display interesting symmetry in the structure and patterns contained in their parts. Based on symmetry, flowers can be grouped into three categories: asymmetrical, bilateral, and radial. Asymmetrical flowers have no plane of symmetry. Bilateral flowers have a single plane of symmetry (monosymmetry), and radial flowers have multiple planes of symmetry (polysymmetry). Symmetry in flowers often plays an important role in their visual appeal and aesthetic beauty. Each type of symmetry gives its own characteristics to the structure of the flower and provides a unique appeal to the observer (Spencer & Kim 2018). The types of flowers found in this study are mostly found in the radial group of 88 flowers. For flowers included in the bilateral group there are 31 types of flowers and asymmetrical groups there are 31 types of flowers (Figure 3).

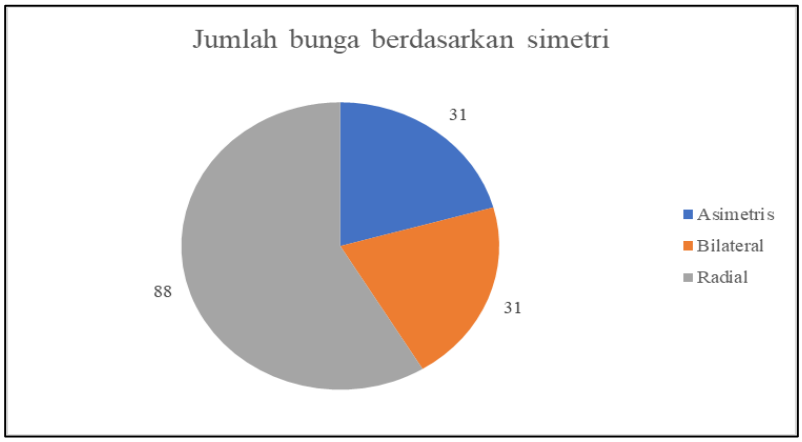

Figure 3. Number of flowers by symmetry

Flower morphology refers to the physical structure and main parts of a flower which includes parts such as petals, corolla, stamens, pistils, flower stalks, and other parts that make up the main components of a flower which causes the golden ratio yield data on flowers to be found very Vary. Variations in flower size and flower symmetry can be influenced by factors such as ecological uniformity and involvement of pollinating species (Lázaro &; Totland, 2014). Based on the results of the analysis, 9 comparisons of the ratio of gold to interest were found. The golden ratio of flowers is found in the ratio between (1) Total area to partial area of flowers; (2) Crown length to crown width; (3) The total width of the flower with width up to the receptacle; (4) Total height with crown height up to receptacle; (5) Width with the height of the receptacle; (6) The total area with the area of the inner crown; (7) Flower height with pattern width; (8) The height of the crown with the height of the pattern on the crown; (9) The height of the flower with the radius of the flower.

IV. Discussion

Total area with partial area of flowers

Plantgrowth contexts, "total area" and "partial area" refer to two different concepts depending on the context in which they are used.When talking about total area and partial area in the context of a plant or flower, measuring leaf area or the area of a particular area of the plant becomes important in understanding the growth, development, and health of the plant as a whole or its parts. Scientific research or agricultural practice often involves measuring leaf area or specific areas of a plant to understand different aspects of plant growth and response to the environment. The following types of flower plants are found in the Tamana National area of Mount Gede Pangrango in the ratio of golden flowers, namely: *Begonia itaguassuensis, Begonia rex, Ipomoea purpurea, Ipomoea quamoclit, Strobilanthes reptans.*

The ratio of the length of the crown to the width of the flower corolla

The ratio of the length and width of the flower corolla can provide information about the shape or morphology of the flower. Some flowers have a longer corolla compared to their width, while other flowers may have a wider corolla compared to their length. This difference in the ratio of length and width of the flower corolla can be one of the many visual characteristics that distinguish one type of flower from another. Observations of the ratio of length and width of flower corolla can be part of botanical analysis or scientific research to understand variations in the morphological characteristics of different flower plants. It can also be used in the context of aesthetics or the selection of plants for ornamental garden purposes, where preferences for the shape and appearance of flowers can be taken into consideration in the selection of desired plants. The following types of flower plants are found in the Tamana National area of Mount Gede Pangrango in comparison to the golden ratio of flowers, namely: *Calotropis gigantea, Cleome rutidosperma, Commelina diffusa, Ipomoea pes-caprae, Scaevola taccada.*

The ratio of the total width of the flower to the width to the flower receptacle

The ratio of the total width of the flower plant to the width to the receptacle refers to the ratio between the total width of the flower plant and the measured width to the receptacle (the place where the stamens and pistils of the flower attach) to the flower. The total width of a flower plant refers to the overall width of the flower plant from the highest point to the lowest point or generally refers to the horizontal size of the flower. While the width to the receptacle is a measurement of the width of the flower from the highest point to the place where the bottom or base of the flower is attached to the receptacle part. This ratio comparison can provide information about the proportions or shape of the top of the flower (from the edge of the flower to the base where the flower

is attached to the receptacle). This ratio can be part of the morphological analysis of a flower plant and can provide insight into the structure or visual characteristics of the flower. This measurement and analysis of the ratio of the total width of a flower plant to the width to the receptacle can be done in the context of botanical scientific research or as part of an aesthetic assessment to evaluate the beauty or visual characteristics of different flowers. The following types of flower plants are found in the Tamana National area of Mount Gede Pangrango in comparison to the golden ratio of flowers, namely: *Ipomoea triloba, Strobilanthes hamiltoniana*.

The ratio of total height to crown height to flower receptacle

The total height of a flower plant is the overall height of the flower plant, including the stalk and other parts that can be included in the overall measurement of the plant's height. While the height of the crown to the receptacle measures the height from the top or edge of the flower crown to the bottom or base of the flower where the crown is attached to the receptacle. This ratio provides information about the proportion or ratio between the top of the flower (corolla) and the bottom or base of the flower (receptacle). These measurements can provide insight into the proportions and shape of the flower as well as the proportion between the corolla, which is usually more visually striking and the base of the flower. The following types of flower plants are found in the Tamana National area of Mount Gede Pangrango in comparison to the golden ratio of flowers, namely: *Begonia muricata, Echinodorus cordifolius, Ipomea mauritiana, Taraxacum officinale*.

Ratio of width to height of flower receptacle

The width of the receptacle is the horizontal size or width of the part where the stamens and pistils of the flower are attached to the flower. Meanwhile, the height of the receptacle is a vertical measurement from the bottom of the receptacle to the top where the stamens and pistils of the flower attach. This ratio comparison provides information about the proportion between the width and height of the receptacle in the flower. It can be part of the morphological or structural analysis of a flower and can provide an understanding of the proportional characteristics of the receptacle in the flower. Measurement and analysis of the ratio of width to height of receptacle in flowering plants can be a consideration in botanical research or aesthetic evaluation to understand differences in morphological or visual characteristics of receptacle in different types of flowering plants. The following types of flower plants are found in the Tamana National area of Mount Gede Pangrango in comparison to the golden ratio of flowers, namely: *Cyrtandra picta, Pandorea jasminoides, Ruellia tuberosa*.

The ratio of the total area to the inner corolla area of the flower

The ratio of total area to the area of the inner crown in flower plants refers to the ratio between the total area of the parts of the flower plant with the area covered by the inner crown of the flower. This includes the total area of flower plants, which refers to the total area of all parts of the flower plant that can be measured or observed, and the area of the inner crown of the flower is the area covered or filled by the inside of the flower corolla. This inner crown is usually part of the deeper structure of the flower and is not directly visible because it is covered by the outer crown or other parts of the flower. This ratio can provide information about how large the inside of the flower crown is in relation to the whole flower or other parts. The measurement and comparison of the total area with the area of the inner crown can be part of the morphological or structural analysis of the flower, providing insight into the proportions and specific characteristics of the inner corolla in a particular type of plant. The following types of flower plants are found in the Tamana National area of Mount Gede Pangrango in comparison to the golden ratio of flowers, namely: *Hemerocallis envious, Ixora crimson star.*

Ratio of flower height to flower pattern width

The ratio of flower height to pattern width refers to the ratio between the height of a particular part of the flower and the width of the pattern on the flower. Flower height is a vertical measurement from the bottom to the top of the flower. Usually, it refers to the total length of a flower from its base to its tip or the highest part of the flower. For the width of the pattern on flowers is the horizontal size or maximum distance between certain points on the flower that may have a certain pattern or special structure, such as the maximum distance between the points of the edge of the flower, or the width of a protruding part of the flower with a special pattern. This ratio comparison provides information about the proportion between the height of the flower and the width of the pattern seen in a particular structure or pattern on the flower plant. The following types of flower plants are found in the Tamana National area of Mount Gede Pangrango in comparison to the golden ratio of flowers, namely: *Costus afe Ker Gawl, Stokesia laevis.*

The ratio of crown height to pattern height on the crown

The ratio of crown height to pattern height on the flower crown refers to the ratio between the height of the flower crown and the height of the pattern contained in the flower crown. The height of the flower corolla is the vertical size from the top to the bottom or base of the corolla. The corolla is the generally prominent part of

the center of the flower, consisting of clusters of stamens and pistils surrounding the center of the flower. More specifically, the height of the pattern on the corolla can refer to the height of a particular part that forms a special pattern or structure within the corolla. This can include prominent or visually distinct parts within the corolla. This ratio comparison provides information about the proportion between the height of the flower crown and the height of a certain pattern that is in the crown. The following types of flower plants are found in the Tamana National area of Mount Gede Pangrango in comparison to the golden ratio of flowers, namely: *Iris domestica, Plumbago auriculata.*

The ratio of flower height to flower radius

The ratio of flower height to radius in flowering plants is the ratio between the overall height of the flower to the distance from the center of the flower to the outer edge of the flower or the radius of the flower. Flower height is the vertical size from the bottom to the top of the flower, or the total length of the flower. For Radius on a flower is the distance from the center of the flower (the center point from which the parts of the flower surround) to the outer edge of the flower. It measures how far parts of the flower such as petals or other parts spread from the center of the flower. This ratio comparison provides information about the proportion between the height of the flower and the radius of the flower. This ratio can provide an understanding of how big or small the height of the flower is compared to the distance covering the outer area of the flower or how 'tense' or 'closed' the flower is against its center. Analysis of the ratio of flower height to radius in flowering plants can be used in the context of botanical research or aesthetic evaluation to understand the morphological or visual characteristics of a particular flowering plant. The following types of flower plants are found in the Tamana National area of Mount Gede Pangrango in comparison to the golden ratio of flowers, namely: *Alternanthera philoxeroides, Ludwigia peruviana.*

The golden ratio value data found from the area comparison results is the most common position found in this study. The golden ratio has been used to analyze the proportions of natural objects, for example in flower crowns (Ghorbani, 2019). The theory states that the golden ratio has been universally expressed on a line partitioned into two unequal lengths such that the longer length divided by the shorter length is equal to the sum of the two lengths divided by the longer length (Yalta et al, 2016). This is in line with the theory stating that the golden ratio is usually determined by the division of lines in such a way that the golden ratio is found in the ratio between the longer and shorter lines (Davis & Jahnke, 1991). In this study, six flowers were found to have the golden ratio in this position. Flower crowns always show the golden ratio in their pattern and arrangement (Chavan & Suryawanshi, 2020; Fierz, 2015; Pandey, 2023; Sarma & Bhuyan, 2018). One obvious example in this study can be seen in the golden ratio that lies in the ratio between the area of the entire corolla and the area of the inner corolla. Floral patterns often feature bright and attractive colors, which can enhance the visual appeal of an object or space. These patterns are generated directly on the geometric model of the flower. Different color combinations in floral patterns can create pleasing and harmonious visual effects (Ringham et al, 2021). This is in line with the notion that the golden ratio is considered the most aesthetic value for human visual perception and is present in the comparison of the body size of various living things, the growth patterns of some types of plants, insects, and even in the representation of models of the universe (Akhtaruzzaman & Shafie, 2012).

The golden ratio has an important role as one of the main sources of information in determining the beauty value contained in floral forms. The appearance of beautiful structures based on the golden ratio suggests that the role of the golden ratio is involved in the development of awareness and leads to the aesthetics of flowering plants (Gardiner, 2012). Tourism attractions often rely on information related to ethnobotany as one of the key points that make the destination attractive to visitors. Ethnobotany is a branch of botany that studies the interaction between humans and plants, especially in the context of culture, traditions, and the use of plants by various societies around the world. The discipline combines botanical knowledge with aspects of anthropology, ethnography and sociology to understand how humans utilize plants in various daily activities. This will certainly open a window of knowledge about plants and how people use them in their daily lives. When visitors gain this knowledge, they will be able to more deeply understand the important cultural values contained in each type of plant. Information on ethnobotany is an important element that enriches the tourism experience and promotes a deeper understanding of human relationships with nature. In line with research on the analysis of visual preferences for *landscape planting,* which shows that the presence of flowers can increase the impression of beauty in the landscape (Nabilah, 2021). In addition, there is research that shows that flower gardens are considered a beauty program that attracts visitors and visitors prefer the comfort gained from seeing the beauty of flowers in the garden (Mariski *et al*., 2017). The following are all types of flower plants in (Table 2) which have a golden ratio value that can be utilized as an educational effort in the Mount Gede Pangrango National Park area.

Table 2. Plant data in the Mount Gede Pangrango area

Location Name	Name Plant Species
Along the road to the Mount Gede Pangrango National Park area	Arachis duranesis, Asclepias curassavica, Begonia muricata, Brunfelsia latifolia, Brunfelsia pauciflora, Camellia sasanqua, Canna paniculate, Centrosema virginianum, Cephaelis ipecacuanha, Cestrum aurantiacum, Clivia miniate, Commelina diffusa, Cyrtandra picta, Dendrobium spathilingue, Dichorisandra thyrsiflora, Dicliptera tinctoria, Dombeya wallichii, Epidendrum radicans, Evolvulus nuttallianus, Galinsoga parviflora, Galphimia glauca, Hemerocallis envious, Hydrangea macrophylla, Impatiens glandulifera, Ipomea mauritiana, Ipomoea purpurea, Lindernia antipoda, Lobelia brevifolia, Ludwigia peruviana, Mansoa alliacea, Montanoa bipinnatifida, Mussaenda erythrophylla, Nothoscordum bivalve, Pandorea jasminoides, Pelargonium inquinans, Petunia atkinsia, Plumbago auriculata, Ravenia spectabilis, Rhododendron concina, Rhododendron macgregoriae, Rhododendron mucronatum, Rhododendron simsii, Richardia scabra, Rotheca serrata, Rubus rosifilius, Salvia coccinea, Serissa japonica, Sida acuta, Stokesia laevis, Strobilanthes hamiltoniana, Strobilanthes sp, Symphyotrichum novae-angliae, Synedrella nodiflora, Tabernaemontana Africana, Tagetes patula, Taraxacum officinale, Thunbergia alata, Thunbergia natalensis, Tillandsia guatemalensis, Tradescantia zebrina, Trimezia steyermarkii, Tulbaghia violacea

The beauty of ornamental plants can actually be a tourist attraction. Several previous studies have shown that ornamental plants can increase tourist attraction and become a potential in the development of objects, one of which is a tourist village. For example, Ngadas Village in Malang, East Java, located on the slopes of Mount Bromo, offers beautiful natural scenery and stunning flower gardens. Flowers such as edelweiss, hortensia and sunflowers can be found here. In addition, the village is also famous for the beauty of its colorful vegetable fields (Prayogi, 2022). This allows tourists to learn, respect, and understand culture and nature in a meaningful context, such as making a positive contribution to the local community and environmental preservation.

Besides being an object of tourist attraction, information related to the gold ratio in flowers can also be utilized as a source of knowledge for ecotourism interpretation. This is because the golden ratio is scientific. The golden ratio is the result of the calculation of mathematical proportions that are considered beautiful and harmonious by previous researchers. The golden ratio has been studied and used in various fields of science, including mathematics, physics, biology and art (Omotehinwa, 2013; Olsen, 2018; Abu, 2015). Thus, this information can be an educational guide or source of knowledge related to ecotourism that fulfills the aspect of visitors' understanding of tourist sites. Understanding the unique characteristics of different types of flower plants can help in identifying and distinguishing one type of plant from another. Knowledge of the characteristics of flower plants helps in selecting the right plants to grow in a particular environment. Factors such as climate, soil conditions, required maintenance, and aesthetic appearance can be considered to determine the appropriate plant type. By understanding the characteristics of flower plants, we can better understand their ecology and natural habitat requirements, which is important for conservation and preservation activities of flower plants that may be threatened or rare. Therefore, knowing the characteristics of flower plants not only helps in their growth and care, but also contributes to a better understanding of the flora, providing extensive benefits in various aspects of daily life.

V. Conclusion

Flower plants in Sukabumi area showed that all flowers have golden ratio value. The golden ratio value of flowers in the Mount Gede Pangrango area found 9 different variations from 62 types of flowers found in the comparison between morphology. The golden ratio was mostly found in the comparison between the total area of each flower and the area of some flowers as well as the comparison between the length and width of the crown of each flower. Calculating the golden ratio value in flowers can provide a number of benefits related to aesthetics, symmetry and visual beauty. The use of the golden ratio can help create a balanced and proportional composition between the different parts of a flower. The golden ratio proportion design can have a positive psychological impact on the human perception of beauty and ideal proportions.

The beauty of flowers can provide benefits not only visually, but also through educational dimensions and potential as a driving factor for tourism. Flowers found in Sukabumi can be utilized as tourist attractions, especially in conservation areas such as National Parks, Geoparks, or Nature Tourism Parks. In addition to being a tourist attraction, some flowers can also be commercialized as ornamental plants. Information on the gold ratio of flowers can be used as a source of knowledge for ecotourism interpretation programs for the general public.

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