

Revealing the Eco-aesthetics of the Pangium Edule Tree: A Natural Sources of Spices in a Time of Dendrophobia

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Abstract

Pangium edule is a spice-producing tree with many benefits; ironically, while these benefits are acknowledged, this tree has become critically endangered. Some parts of the Pangium are traditionally used as spices and have recently become valuable for reasons of both personal health and human economics. This species needs to be preserved by any means including art. In fact, art has the potential to become a strategic medium in a campaign of preservation.

This paper introduces the idea of the eco-aesthetics of the Pangium as an agent in its preservation, indeed very survival. The problems are: 1). The limitation of batik motif variations in developing traditional Indonesian art as inspired by rare plants; 2) The challenge of making batik a medium to enhance awareness of the importance of conserving these same species. The aims of this paper are: 1). The creation of a novelty variety of batik ornaments sourced from *kluwak* plants; 2). Implementation of novelty illustrations to batik media as a media mobile message; and 3). Batik visuals as a narrative medium. This research employs qualitative research examining the community utilization of the produce of the Pangium.

It begins by searching for the very presence of this now elusive species, carefully observing the tree as a whole and empirically deconstructing and interrogating each component. Various objective facts are then derived from these new insights and cross-referenced through a literature study. Informed observation consequently forms the basis for experimenting with various creative visual compositions that represent the beauty, uniqueness, and rarity of this species. In turn, this forms potential for the basis of *Pangium edule*-specific 'eco-aesthetic designs'. This study shows the scarcity of the Pangium has resulted from a broad knowledge deficit combined with personal indifference. This study also shows that when socialized as eco-aesthetic design, the Pangium becomes better known, deeply appreciated, and as a direct result—preserved.

Keywords: Eco aesthetic approaches; *Pangium edule*; Dendrophobia; *Kluwak*

Introduction

Art has significant potential to become a medium and simultaneously a method to overcome a problem, which in this context plays a role in campaigning for the preservation of a species that produces herbs and spices—namely, the *Pangium Edule* tree whose existence is endangered. Pangium bears fruit; the fruit contains many seeds. The seed is commonly called *kluwak*. Untreated Pangium seed contains cyanide; the contents of *kluwak* seed must be first fermented for a relatively long time—approximately 40 days—if they are to be used as a spice for cooking or as a delicious snack ingredient (Dwi, 2012). The flesh of Pangium seed is traditionally used as a cooking spice; its other function is as a food preservative (Listyorini et al., 2021). Pangium has also been used as a restorative to treat AIDS and SARS (Tumilaar et al., 2021). The existence of Pangium, which is clearly useful for human beings, is increasingly rare and endangered.

The existence of Pangium is less well-known and understood by the public; even those that exist are not appreciated. Many people do not care, misunderstand, and even fear large trees (dendrophobia), including Pangium trees whose height can reach more than 20 meters. Fear of big trees often becomes hatred toward them (Grove, 2019). This kind of attitude is what has caused the Pangium population to shrink. In various regions, many do not even know that Pangium exists. Pangium plants are not evenly distributed, although they grow in almost all Southeast Asian archipelago regions. Nevertheless, this tree is excessively utilized; the wood is used as a building material, and the seeds are processed as a spice, but the sprouts that grow under and around the mother tree are not maintained and cared for. According to Heriyanto & Subiandono, (2016), the utilization of this tree is not balanced by its preservation.

So far, the study of Pangium as published through journals tends to talk about biological aspects or dimensions (Jatmiko, 2020; Munandar et al., 2018). The physical beauty and ecological role of *Pangium edule* are far from being considered. Indeed, Pangium is only seen as a natural source for a variety of potentially economical and medical products (Guo et al., 2020; Lotfi et al., 2020; Zainuddin et al., 2020). The relationship between the Pangium tree and the surrounding natural environment is hardly ever represented in publications available to the community.

The eco-aesthetic aspect of Pangium is not included in the discourse of most people. Some weaknesses or shortcomings found in the existing literature are as follows. 1). Some studies report that the average number of Pangium seeds is 18. The number of Pangium seeds per fruit ranges from two to 28 pieces of seed; 2). There is no literature specifically observing the visual uniqueness of the strokes on the shell of Pangium seeds, whereas the strokes are individualistically unique; 3). This tree is still only viewed from its functional aspect as a natural source of herbs and spices.

The understanding of Pangium only revolves around its function as a spice (Jatmiko, 2020; Munandar et al., 2018). From the existing literature, it can be said that issues related to the beauty and entity of this tree concerning its natural habitat have not been examined. Visual and ecological potential as a whole and its component parts are significant to realize as an object of conceptual art. In short, the eco- aesthetics of this species can be drawn out, formulated, and declared as the beauty of a living tree. In other words, the existence of the Pangium has not been associated with beauty. The eco-aesthetics of the Pangium are, when it grows naturally, its physical shape and natural appearance functions as lines, shapes, and forms that adorn the environment where the tree grows.

The purpose of this paper is to complement the shortcomings of previous studies that ignore the eco-aesthetic of the Pangium. The diverse and valuable uses of Pangium are not in line with the threat of Pangium extinction because its regeneration is hampered. Correspondingly, this paper contains three things that are intertwined: 1). Exposure to the existence of the threatened Pangium (the benefits are great for both people and the environment); 2). documentation, narration, and management of leaf creativity, Pangium seed shell texture, bark texture; and 3). Eco aesthetic visualization in the form of a metaphor for Pangium, as an important spice tree, needs preservation. Presentation provides knowledge

about the relationship between the art world and natural wealth. Indeed, local knowledge in a community is an essential source of the creative process.

This paper is based on the argument that natural resources are a source of creative ideas. In this way, art can also contribute to the preservation of nature itself. Pangium trees are an increasingly rare species threatened by the human ignorance of their intrinsic value, benefits and uses. Using the Pangium in art can create an environment that produces eco-aesthetics. Documenting and narrating the existence and benefits of the Pangium can inhibit the extinction of this species. The process of documenting and narrating can be carried out through the eco-aesthetic visualization of the elements of the Pangium tree. Thus, the creative process can provide an answer to the threatened extinction of the Pangium for the benefit of human life.

In this context, the aims of this paper are: 1). The creation of a novelty variety of batik ornaments sourced from *kluwak* plants; 2). Implementation of novelty illustrations to batik media as a mobile message media; and 3). Batik visuals as a narrative medium.

Literature Review

"The analysis of previous literature as part of advanced research aims to identify research gaps and generate innovative ideas (State of The Art). "Below is an analysis of the previous research article."

Roger S. Ulrich, in an article titled "Aesthetic and Affective Response to Natural Environment," presents that: Ecological aesthetics is an interdisciplinary field that explores the relationship between aesthetics, ecology, and the environment. Defining affective and aesthetic response refers to understanding and explaining the emotional and subjective reactions that individuals have towards the natural environment. Affective response, also known as emotion, encompasses the innate and cross-cultural phenomena that involve experiential, facial, and neurophysiological components. On the other hand, aesthetic response is defined as the preference or like-dislike affect associated with pleasurable feelings and neurophysiological activity elicited by visually encountering a natural setting. These variables can be measured separately, but studies indicate that aesthetic preference and pleasurable feelings typically load on the same dimension. In theory and research, aesthetic preference is often interpreted as an affect within the broader pleasantness dimension of emotion. To establish a firmer foundation for understanding affective response to the natural environment, it is important to address critical issues related to emotions and cognitive evaluation. In the past, feelings were viewed as products of thought, and this perspective has been applied to explain aesthetic and affective responses. According to this interpretation, an observer's affects are postcognitive phenomena resulting from a process of cognitive evaluation or appraisal of a scene. This perspective is echoed in intuitive work and some experimental literature on landscape aesthetics. (Ulrich, 1983) One influential work in the field of environmental aesthetics is 's book "Aesthetic and Affective Response to Natural Environment" (Ulrich, 1983). explores the emotional and aesthetic responses that individuals have towards natural environments. This work highlights the importance of considering the aesthetic and affective dimensions of our relationship with nature. (Ulrich, 1983).

Another important contribution to the field is 's article by Defrančeski "Environmental Aesthetics and Land Art," This article discusses explores relationship between environmental aesthetics and land art. The author examines the historical development of these concepts and suggests that land art can be understood as a hypernym that encompasses various art practices. The characteristics of land art, such as integration, interruption, involvement, implementation, and imagining, are analyzed, and the author proposes that land art represents not only a contemporary art movement but also a new form of aesthetic expression. (Richardson, 2019). Environmental aesthetics explores the relationship between art and the environment, focusing on how we perceive and experience the natural world aesthetically. Land art, on the other hand, is an art movement that emerged in the late 1960s and early 1970s, characterized by artists creating works directly in the landscape using natural materials. (Richardson, 2019). Both environmental aesthetics and land art recognize the importance of engaging with nature in an aesthetic manner. They highlight the beauty and significance of the natural environment,

encouraging viewers to develop a deeper appreciation for the world around them. In conclusion, environmental aesthetics and land art share a fundamental idea – the importance of aesthetic appreciation of nature. They both contribute to our understanding and experience of the natural world through artistic expression and engagement. (Richardson, 2019). This article highlights the emergence process of artistic diversity using earth as a medium following aesthetic exploration with Nature.

Article "Nature, Engagement, Empathy: Yijing as a Chinese Ecological Aesthetics" Li & Ryan (2017) examines the concept of ecological aesthetics from a Chinese perspective. The authors argue that ecological aesthetics should prioritize awareness of nature, species, and environmental issues. They emphasize the importance of grounding aesthetic appreciation in ecological ethics and countering biases that prioritize human appreciation over the value of other beings and elements. (Li & Ryan, 2017). Based on the provided context, the key points are as follows: 1). Differentiation between Yijing and the I Ching: The article begins by distinguishing between Yijing and the divinatory text, the I Ching. While they share a common basis in Taoism, they are conceptually divergent; 2). Yijing as an aesthetic system, framework, or ideal: The authors specify Yijing as an aesthetic system, framework, or ideal; 3). Subject-object correspondence and engagement; and 4). Empathic identification or bio-empathy: Another key aspect of Yijing discussed in the article is empathic identification or bio-empathy. Historical sources and examples: The article provides a critical overview of historical sources, including philosophical works, paintings, illustrations, calligraphy, and poetry. It highlights the relevance of these examples to the history of yijing. The article also delves into contemporary ideas in Chinese environmental aesthetics, including Western aesthetic principles. It specifically discusses recent debates on engagement and bio-empathy, which are essential to conceptualizing Yijing as an eco-aesthetics. (Li & Ryan, 2017)

Article "Environmental aesthetics: A synthetic review" Brady & Prior (2020) provides an overview of the field of environmental aesthetics. It discusses how this subfield has emerged from the philosophical fields of aesthetics and environmental philosophy. The authors highlight the interdisciplinary nature of environmental aesthetics, drawing from disciplines such as geography, psychology, and landscape architecture. Based on the provided context, the key points discussed are as follows: 1). The article explores the concept of YIJING as a Chinese ecological aesthetics. It discusses the relationship between nature, engagement, and empathy; 2). Yijing is specified as an aesthetic system, framework, or ideal, with artists and poets striving to express it in their works; 3). The article presents a critical overview of historical sources and discusses subject-object correspondence and empathic identification as key aspects of Yijing; 4). It analyzes key philosophical works, paintings, illustrations, calligraphy, and poetry relevant to the history of yijing and 5). The article also explores contemporary ideas in Chinese environmental aesthetics and Western aesthetic principles, particularly recent debates on engagement and bio-empathy. (Li & Ryan, 2017).

The relationship between aesthetics and ecology is further explored in 's article "Aesthology and Its Implications for Art and Design Education: Examining the Foundations" (Hall & Turner, 2021). They argue that this relationship brings new characteristics and perspectives to art and design education. Based on the context provided, the new characteristics and perspectives to art and design education include: 1). Connecting the physical and intellectual.combining doing and thinking, affectiveness and effectiveness; 2). Understanding artistic perception and awareness of material qualities; 3). Slowing down and true mindfulness through making and making meaning. (Hall & Turner, 2021)

These new characteristics and perspectives aim to foster creativity, imagination, and aesthetic perception in students, providing them with opportunities for self-expression and exploration. Students develop their artistic and cultural awareness, which supports their imagination and creativity. The quality, variety, and depth of their experiences in art and design are fundamental to their progress in interpreting and appreciating what they see, hear, and observe. This holistic approach to art and design education nurtures critical thinking skills by promoting deep engagement, reflection, and interpretation of artistic experiences. In summary, art and design education contributes to the development of critical thinking skills by fostering

imaginative, complex, and critical ways of learning. Through these experiences, students develop aesthetic perception, integrate doing and thinking, and enhance their ability to interpret and appreciate the arts. (Hall & Turner, 2021)

"Environmental Aesthetics, Ethics, and Ecoaesthetics" Carlson (2018) addresses the link between environmental aesthetics and environmental ethics. Some key principles of eco-aesthetics include: 1). Ecological consciousness: Eco-aesthetics presupposes ecological awareness as the foundation for aesthetic appreciation; 2). Biodiversity and ecosystem health. It emphasizes the need to move beyond anthropocentric value standards and human aesthetic preferences, reflecting and critiquing anthropocentric habits; 3). Aesthetic engagement: Eco-aesthetics promotes the idea of aesthetic engagement, which involves actively participating in and experiencing the environment; and 4) Ecological knowledge. Understanding ecological principles and concepts helps refine one's aesthetic taste and enables the enjoyment of the hidden aesthetic properties of the ordinary. (Carlson, 2018)

Overall, the field of ecological aesthetics explores the intersection of aesthetics, ecology, and the environment. It considers how our aesthetic experiences and perceptions of the natural world can shape our understanding and care for the environment. This interdisciplinary field draws from various disciplines and perspectives to deepen our appreciation and engagement with the natural world. In the literature review, there have been few discussions about the concept of eco-aesthetics until the creation of various "Batik patterns as traditional Indonesian art" as a medium for a campaign to protect the Pangium Edule plant. This article will contribute to the further development of the concept of eco-aesthetics in the field of art.

Eco-Aesthetic Approach

Since the mid-20th century, ecology has been widely found in humanities and social science studies to contextualize various aspects of social and cultural life (Indrawati, 2016; Guo et al., 2020). Concerning aesthetics, ecology has one interdisciplinary approach called eco-aesthetics that integrates fundamental elements of aesthetics into the human-entered environmental and ecological order (Haruna et al., 2018). In art, eco aesthetics bridges art with the humanities and social sciences, where this approach formulates alternative perspectives on practice and works of art, especially their influence on the environment (Peck, 2016). Art plays a role in encouraging literacy and building awareness of the environment (Buening et al., 2022; Nnamdi et al., 2013). The creative process in the realm of art actively contributes to providing sound, form, and aesthetic visuality to express problems and concerns over climate and the environment (Thorsen, 2020). Therefore, although art has not been considered capable of initiating change, it contributes to building awareness which is an essential foundation of constructive change (Miles, 2016).

In addition to demonstrating a role in building awareness, eco-aesthetics also positions beauty to be applied to ecological landscapes. For example, street trees form an essential part of a green infrastructure and contribute to the resilience of a city (Devi et al., 2023). It also integrates aesthetic elements, such as rhythm and unity, into the environmental landscape design to improve ecological function and sustainability (Haruna et al., 2018). This concept is relevant to Baranov et al. (2018), who says that the basis of eco-aesthetics is the principle of utility or expediency and beauty (aesthetics). In art education, the eco-aesthetic approach advocates pedagogy emphasizing awareness of space, sensitivity to local issues, and collaboration between communities (Finley, 2011). Such eco-aesthetic pedagogy is relevant to artistic characteristics such as the embodiment of space, education, and public participation as instruments of social transformation and the ethics of care that are pluralism and performative (Finley, 2011). From the various explanations above, it can be seen that eco aesthetics is related to an artistic approach that pays attention to the environment and carries the principle of sustainability (Carlson, 2018). Thus, eco-aesthetics is also related to environmental ethics, where environmental ethics will benefit when serious attention is paid to environmental aesthetics (Carlson, 2018).

Research Method

The process of making motifs from the *kluwak* plant starts from seeds, seeds, fruits, shells, leaves, and tree trunks through a design thinking approach. Robin Landa's design process methodology (2014) divide into the stages of: 1). Empathy; 2). Define 3). Ideate; 4). prototype, and 5). testing.

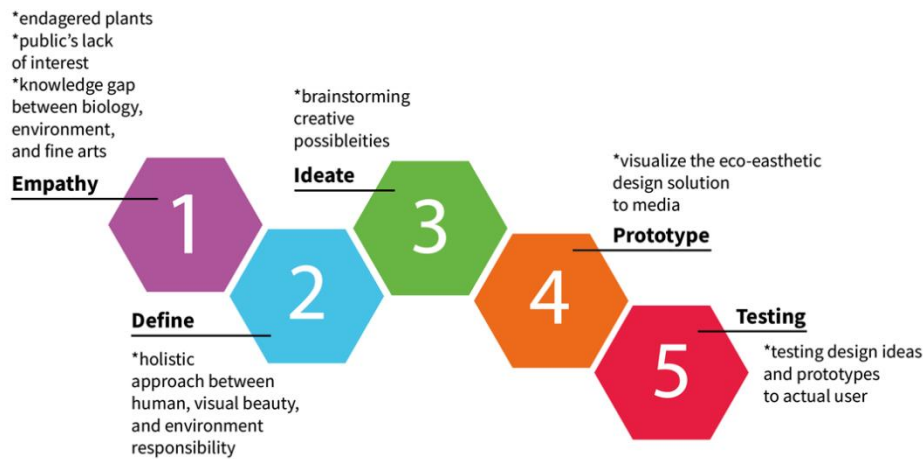


Fig. 1: Design thinking approach

Source: Authors

Empathy is a key component of design thinking, and when combined with an eco-aesthetic, it can be a potent tool for developing solutions that are both ecologically friendly and sustainable. Understanding and empathizing with users or stakeholders' needs, views, and feelings are essential components of empathy. In this study, empathy develops out of care for endangered plants (such as *kluwak*) and the general public's lack of interest for them, creating a gulf between the fields of biology, the environment, and fine arts in their attitudes toward society. In the context of design thinking for eco aesthetic, define process is how to clearly define the problem or opportunity within the context of eco aesthetic design. This step involves synthesizing the information gathered during the empathy phase and framing the challenge in a way that encourages innovative and sustainable solutions. In this study, define process involves a holistic approach that bridges the gap between human creativity, visual beauty, and environment responsibility from the *kluwak* through the visual uniqueness of *kluwak* starting from seeds, flowers, seeds, shells and others.

In the ideate phase, a variety of original concepts and ideas that combine innovation, sustainability, and beauty are generated. This stage promotes unrestricted possibility exploration, brainstorming, and free thought. In this research, the ideate process is carried out by transforming the various creative possibilities that can be generated by *kluwak*. Prototype phase involves creating tangible representations of ideas and concepts. Prototypes allow to test and visualize the eco aesthetic design solutions in a more concrete form before fully committing to implementation. In this study, the visual findings (motifs) from *kluwak* were applied to new media, including fabric, cloth, and others (batik), to carry out the prototype process. Testing phase entails testing the design ideas and prototypes on actual users, stakeholders, and the environment. Gathering comments, improving the designs, and making sure eco aesthetic solutions successfully balance sustainability and visual appeal are all key parts of this step.

Data was obtained through qualitative research based on documentation and visualization of pangium. This involved observations and direct interviews with related parties and the location of the pangium tree. Secondary data were obtained from documents and literature on pangium trees. The data explored include visual metaphorical elements: (1) pangium leaf forms: leaves that have just appeared, that have begun to enlarge, and that have

matured; colors and shapes are the focus of observation as well; (2) Pangium flowers: whose petals are 5, 6, and 7; (3) *Kluwak* shell; specializing in the distinctive shapes and strokes of the seed shell; (4) Texture of pangium tree bark and; (5) Branches and branches of pangium trees.

The data acquisition process involved observing pangium trees in Yogyakarta. This process was assisted by several informants: farmers, artists, forestry scholars, collectors of rare trees, and culturalists interested in observing cultural ethnicities. They observed empirically, and felt the atmosphere of being in the habitat of pangium trees to provoke fresh ideas through free association. This in-depth observation can generate the possibility of the pangium tree discovering aspects that have the potential to be the beauty of the pangium. So that the beauty of pangium is visible and distinctive. Data, information, unique ideas, and sensations of the visual appearance and benefits of pangium are the essential elements of the arrangement of the metaphor of the pangium. The data from this research is then formed to experiment with sketching and applying basic visual design principles to create creative metaphors that display impressive images of the pangium.

Finding and Discussion

Exposure to the Existence of Threatened Pangium as Empathy step

In the methodology of design thinking, empathy refers to the ability to fully understand and feel the experiences, perspectives, emotions, and needs of others. In the context of the role of fine arts in raising awareness about the conservation of rare plants, empathy becomes crucial in connecting people with environmental issues and helping them sense the urgency and importance of preserving biodiversity, especially rare and endangered plants. Fine arts can play a significant role in evoking empathy towards the protection of rare plant species

The pangium trees is used in various fields, but this is not in line with their preservation. According to pangium tree search data in Yogyakarta, only eight pangium trees were found in 2023. The eight trees consist of adult pangium and young pangium. The following is a description of the existence of the eight pangium trees in Yogyakarta

Table 1: The Existing of Pangium in Yogyakarta

Source: Authors

No	Location	Number	The Tree	Meaning and Benefits According to Society
1	Taman Leco, Girimulyo, Kulon Progo	1	Mature Pangium	The Household Officer only collected the fallen pangium fruits and handed them over to the surrounding residents who processed the contents of the <i>kluwak</i> seeds through fermentation for more than 30 days.
2	Godean	2	Mature Pengium Tree	Utilizing fruits, leaves, and seeds to be processed into seasonings through fermentation
3	Sayegan	4	Mature Pangium Tree	Once, the inhabitants used pangium leaves to catch fish, now that habit has disappeared; however, it still uses the content of <i>kluwak</i> , which has been fermented as a seasoning or directly used for seasoning to make chili sauce and sold to collectors
4	South of Madukismo sugar factory	1	Young Pangium Tree	This tree has not yet borne fruit; its age is less than five years; Pangium bears fruit only after 15 years.

Table 1 shows that the eight pangium trees in Yogyakarta did not regenerate well. All the trees found were adult and old ones. They did not seem to have been well looked after. Their death or life seemed to be left unattended. Even one young pangium tree located South of the Madukismo sugar factory, which is still less than five years, is in danger of being cut down because it grows close to the road; the area between them is not broad enough. In addition to the absence of regeneration, pangium trees have also not been optimally utilized by the local

community. It is seen from the pangium tree in Kleco Park in the Menoreh Mountains area. The guard collects the fruits that fall in season and then handed over to the other party for processing.

The same thing happens to the pangiums in the Godean area in the form of two pangium adult trees; their fruits, seeds, and leaves are to be processed into seasoning through fermentation. Similarly, four other trees at Sayegan, also look to be entirely shattered. Only the seeds of pangium are collected in sacks and then handed over to the collector.

The suboptimal utilization of pangium trees was justified by Sukarman from Seyegan. He revealed that pangium tree parts tend to be no longer used. In the past, pangium was often used to pick up fish from the pond by spreading pieces of pangium leaves to the pond first. The flesh of the fruit shell of pangium were used for sowing young fruits to ripen. Fermented seed contents are often used as a seasoning for chili sauce. However, this habit has also been forgotten by most people in Seyegan. Local wisdom in utilizing the natural products of pangium trees has disappeared from the discourse of the people in the area.


the pangium tree near the Madukismo sugar factory, Bantul is used in another way, namely as an organic fertilizer taken from dry leaves. However, it is endangered due to the location of trees that are considered to interfere with the road. Thus, the utilization and role of pangium trees for the community are minimal, which correlates with the increasing scarcity of pangium trees due to them never having been preserved.

Documentation, Narration, and Generating creative ideas for pangium trees as Define step in Design Thinking Methodology

Define in the methodology of design thinking is the phase where the problem is clarified after understanding user needs and is crucial for identifying the core issue. In the context of fine arts and rare plant conservation awareness, this phase outlines the specific problem or need for conservation efforts. It guides subsequent stages, ensuring creative efforts effectively convey the urgency of protecting these plants to a wider audience.

The documentation, narrations, and generating new ideas on the pangium trees are aimed at providing a visual picture of the pangium. These acts are part of preventive efforts to avoid the extinction of pangium. Here are the visualization and documentation of the elements of the pangium tree assembled.

Table 2: Parts of Pangium Tree as Visual Elements
Source: Authors

No	Visualization of Pangium Tree Elements	Utilizing Pangium	Potential for Eco-Aesthtics
1		A pangium seed. In addition to its individually distinctive shape, the strokes of the shell are also distinctive. Its shape and stroke differ from one seed shell to another.	The shape of the fiber that creates its own lines can be used as a motif for fashion objects such as bags, clothes, shoes, and so on.

2



Pangium fruit. In it are stored *kluwak* seeds, and the number is also different. The highest number of *kluwak* seeds the authors found was 28 seeds. The fewest are two seeds. After aging, the fallen fruit must be left for about 10 to 2 weeks until the shell rots and softens. Pangium fruits can be easily opened, and collected seeds for cleaning. Then it is boiled for about 2 hours and allowed to cool. After cooling the pangium seeds are stored in a heap of soil or rubbing ash for 40 days to ferment.

Generally *kluwak* is round and large, has a distinctive color (brown). If *kluwak* seeds can be used as a spice for dishes typical of Central and East Java (*rawon*, *bongkos*) through a certain process, it is very likely that *kluwak* seeds can also be used as a natural fabric dye. As well as inspiring Batik motifs

3



Trubus from sown *kluwak* seeds is unique in shape and growth pattern. It pokes out from the bottom of the seeded seed in an inverted position. This sprout is coiled, and the tip lifts the empty shell. Very inspiring about obedience and kindness.

The process of growing *kluwak* seeds can have a good philosophy of life not only regarding obedience and kindness, but also a pattern of mutual cooperation and mutual assistance. Like other parts, *kluwak* seeds can also be used as Batik motifs.

4



Pangium flowers. The petals are varied in number; some are 5, 6, or 7. From the seven-limbed pangium flower, the author made a mandala shape, not eight-sided like a classic mandala, but a seven-sided profound to create a unique shape. (This photo was taken from Wikipedia; more info from PlantSystematics.Org)

The shape of the *kluwak* flower has petals resembling a seven-pointed star. New philosophy of shape and color. The light green color symbolizes a new, better life.

5



Pangium leaves that have just appeared, characteristic green, fresh, shiny, as if oily.

The shape of the leaves of the *kluwak* plant resembles a palm and has firm fibers. This can be used as a motive with a philosophy of nurturing and helping others.


6		<p>The textured look of the bark of the pangium tree trunk is sensational. Seeing this, the author is interested in making a military camouflage pattern different from the existing one.</p>	<p>The texture of <i>kluwak</i> tree trunks can be used as a new motif for military camouflage clothing.</p>
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Table 2 shows that pangium has seven elements that can be visualized and seen for their benefits. Through the documentation and visualization of these elements, it can be seen that pangium has its characteristics as a tree with an aesthetic value which can then be utilized from seeds to trees or trunks



Visualization of Eco aesthetics of the Pangium Tree as Ideate step in Design Thinking Methodology

In design thinking, the 'Ideate' step generates diverse creative ideas, especially vital when employing fine arts to raise awareness about rare plant conservation. This phase involves brainstorming innovative concepts that effectively convey the importance of preserving these plants, pushing boundaries to engage audiences emotionally and intellectually. Collaboration and inspiration from various fields enhance the process, fostering strong connections between the audience and the conservation cause. Feasibility isn't a primary concern; rather, it's about unleashing creativity. Selecting ideas for further development occurs in later stages, ultimately allowing fine arts to dynamically highlight the urgency of protecting rare plants."

Following is a visualization of trees, habitats, parts of pangiums, namely: leaves, sprouts, flowers, fruits, seeds, bark surfaces, slices of pangium fruits, and seed shells and goulashes. They are produced through photographs and videotapes. It is also important to photograph the pangium tree's environment, including the fruits and seeds of pangium scattered around the tree base, including sprouts and existing plant seeds. This documentation produces a visualization of the pangium that can produce aesthetic value, as shown in the Table 3 below.

Table 3: The Composition of the Different Elements of Pangium

Source: Author

No	Element 1	Element 2	Composition Result
1	<p>Pangium dry leaves</p> 	<p>Rotten fruit after two weeks being picked up</p> 	<p>Composition 1. The title is <i>Swing Kepayang</i>, formed from the shape of leaves, flowers, fruit ovules and pangium fruits that are dissected so that the contents appear.</p>

Seven petal flower

Fresh fruit



2

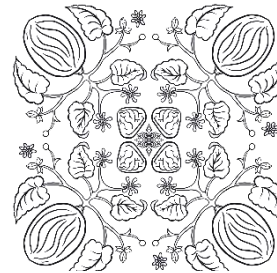
Pangium seed



Leaves, fruits, seeds



Composition 2. Inside- outside
Kepayang .

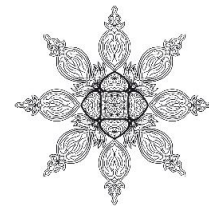


3

Pangium seeds



Dry leaves



Radiating Mandala. Octagon
of the kluwaks and the lines
from dry leaves.

4

pangium trunk texture



Pangium seeds



Composition 4. *Kluwak
Kawung.* Exploring shapes,
forms, colours, textures of the



tree trunk

Implementation of Eco aesthetics of the Pangium Tree as Prototype step in Design Thinking Methodology

In design thinking, the 'Prototype' step translates ideated concepts into visual or interactive forms to effectively convey conservation messages through fine arts, involving

creating simplified versions of artworks for testing and refinement. This step bridges the gap between conceptual ideas and practical realization, allowing artists to gather feedback and enhance the artwork's ability to engage and raise awareness about the conservation of rare plants. The creative visual elements in batik enhance an engaging learning system. (Murwonugroho & Ardianto, 2019)

Table 4: Pangium tree motif for batik
Source: Author



The result of the eco aesthetic visualization of the elements of the pangium tree can be seen in four visual compositions. Composition 1 shows that the focus of this composition is on the shape of the pangium fruit whose outer skin is peeled off, the seeds of which are visible. The curved lines are the impressions on which the title is made - *The Swing of Kepayang*. The composition of 2 that form from fruits, leaves, flowers, fruit ovules, *kluwak*, and *kepayang* twigs. This composition uses 4 *kluwak* seeds on the inside and 4 pangium in the corners of the composition. The name *kepayang* is taken from Jambi, Bengkulu and South Sumatra areas. *Kepayang* means drunk, because people who eat *kepayang* fruit can get drunk like if they mostly eat durian fruit.

Meanwhile, in Composition 3 entitled *Radiating Mandala*, the main element is the pangium fruit. The idea of reference comes from the eight-sided mandala form; the composition is made in such a way as a movement leading from a central point in the middle outward; it is like the energy radiating from the core outwards through the eight forms of the *kepayang* fruit. While Composition 4 represents the sensation of lines, shell texture, and the color pattern, the pangium trunk texture pattern formed a composition whose color pattern has similarities with the color of kawung batik (specifically motifs) from classic Yogyakarta batik. The four compositions produce a visualization of pangium, which has high artistic value and can be utilized and is the reason for the preservation of pangium as a tree with eco-aesthetic value. Batik ornament in fashion is media has become an important field in which the public can respond to statues seeing environment issue physically. (Murwonugroho, 2019)

Discussion

Pangium as a spice tree has become scarce due to ignorance and indifference of the society. Many people did not seem to care for and maintain the plant.. Dislike and hatred towards trees (dendrophobia), especially if it is a big tree, is implicit in this. Many myths state that ethereal beings and the forces of darkness dwell in great trees; An adult pangium tree can reach a height of more than 20 meters. Only few pangiums are found is due to insufficient appreciation by the people.

Pangium is considered an ordinary tree that coexists; Its economic potential and ecological role are almost forgotten. The consequence is the absence of sufficient information and educational narratives about a species called pangium edule. Efforts to care for and preserve the pangium tree have disappeared from the awareness and ecological knowledge of the

community. Popular publications containing the usefulness of pangium trees for people, the environment, and people's lives are not found.

Young people who were asked about this tree replied that they did not know it at all, although the dishes whose main spices were filled with pangium seeds were very popular: brongkos and rawon. If the neglect of this tree is allowed, without sufficient information and education about pangium and its importance, this species will undoubtedly become extinct. This likely possibility is a substantial ecological loss.

This paper argues that this extraordinary spice tree's eco-aesthetic will be lost forever if this situation continues. Thus, reestablishing the socio-cultural, ecological and eco-aesthetic benefits of the Pangium must be pursued with all urgency. This fresh narrative must include the following: that this tree has significant economic, ecological, and eco-aesthetic value, it has a rich history, and an even greater potential.

The phrase, '*pucung dan bijinya*' or, 'like the Pucung (Pangium) seed and fruit' was written in the late 18th century in *Wulang Reh* by King Pakubuwana IV as a metaphor to describe harmony, balance, and respect; in this instance, between older and younger generations. It is an example of the prominence and reverence the Pangium once enjoyed. Such narratives can be re-created for the benefit of contemporary society to again socialize the Pangium tree into the consciousness of the broader community. Visualization and stories about the uniqueness of the Pangium tree must again become public knowledge.

An analysis of the pre-existing documentation, modes of utilization and creative visualization of the eco-aesthetics of the Pangium has shown that the species is highly responsive to art. This includes revealing the scarcity of environmental resources available to protect it. Indeed, the use of visual forms of the Pangium has created new compositions of the highest artistic value. The eco-aesthetic approach can therefore be used in not only observing and analyzing the Pangium tree, but, more importantly, in transforming its component elements into a stream of creative ideas for its very preservation. Such 'artistic sensations' will then arouse first, the people's interest, and then their respect. In the traditional society, communities succeeded in transubstantiating (changing the substance) of the kluwak (Pangium) seed to create both a seasoning and a natural food preserver. Visual narratives and creative metaphors about economic, cultural, and ecological benefits of the *Pangium edule* can likewise transform the dendrophobia associated with the Pangium tree into empathy, affection and even love. This research has been deliberately limited to analyzing one geographical area where the adult pangium tree still exists. Therefore, this study has not comprehensively described the eco-aesthetic potential of the Pangium in other regions with different natural and cultural environments. A broader geographical study is now required. In addition, it is essential to conduct further research into other spice trees consistent with the framework of eco-aesthetic composition established in this study. Using this analysis has, and will, continue to illustrate how natural wealth can be managed as a source of inspiration in producing new artworks with a view to both preservation and conservation.

From this research, the following conclusions can be drawn: 1). Innovation of Batik Ornamentation from Rare Plant Characteristics: This study has successfully generated innovation in the realm of batik ornamentation by drawing inspiration from the characteristics of rare plants. This reflects a high level of creativity in developing batik patterns that depict the uniqueness of these plants; 2). Implementation of Ornamentation as a Knowledge Attractor: The implementation of ornamentation in batik has effectively captivated public interest in understanding the types of motifs employed. This has fostered a desire to learn more about these motifs, consequently giving rise to a significant dialogue concerning the protection of rare plants; 3). The Importance of Dialogues on Rare Plant Protection: Through

the utilization of ornamentation inspired by rare plants, the significance of safeguarding these plants has become a relevant topic of discussion. This ornamentation serves as a means to raise awareness about the importance of preserving biodiversity and the necessity of conservation efforts; 4). A New Awareness of Rare Plant Protection: By combining the art of batik ornamentation with the theme of protecting rare plants, a fresh awareness can emerge within society regarding the importance of preserving these plants. This batik ornamentation also becomes a widely discussed topic, contributing ultimately to the enhancement of environmental protection awareness. The uniqueness of the ornamentation stimulates and triggers a more interactive public response. (Murwonugroho, 2020). Overall, this research has successfully bridged the realms of batik art, biodiversity, and environmental consciousness

Conclusion

This research shows that the population of the Pangium tree has recently experienced a critical decline. This has occurred to the extent that it is now classified as a critically endangered species. Paradoxically, while threatened, the Pangium offers great benefit to the culinary world, is acknowledged as a provider of natural ingredients for both medicines and herbal remedies and constitutes a living buffer for preserving complex ecosystems. Indifference and dendrophobia (an actual fear of trees) are cultural factors that continue to threaten the very existence of the Pangium. Moreover, The decline of the Pangium is in line with an increasing loss of knowledge about its uniqueness and benefits.

From this research, it can be concluded that: 1). Innovation in batik ornamentation has been created, sourced from the characteristics of rare plants. 2). The implementation of ornamentation in batik has become an attraction for people who are interested in learning about the types of motifs. Thus, a dialogue about the importance of protecting rare plants is established. The ornamentation is narrated and widely discussed among many people, leading to the creation of a new awareness of the protection of rare plants.

Recommendation

To overcome the extinction of pangium, programs should be carried out by the Government and the people. The existence of pangium needs attention, its continuity needs the help of many people. People should know about its benefits for the ecosystem's sustainability. They should also know that the produce from pangium trees can be used as ingredients for various products that are good for people's lives, and that pangium leaves and seeds can be used as herbal and medical ingredients. The rarity of pangium trees, the attitude of indifference of many people to the existence of pangium trees, and the attitude of dislike of many people towards large trees need to be expressed in the form of open, intelligent, and interesting articles, visual expressions, and moral appeals. Meanwhile, the disclosure of the various benefits of produce and the beauty of pangium trees must be broadcast continuously to society.

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