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# REFLECTION OF SEED FORM ON SUSTAINABLE CERAMIC ART WITH BIOPHILIC DESIGN PRINCIPLES

## Tohum Formunun Biyofilik Tasarım İlkeleriyle Sürdürülebilir Seramik Sanatına Yansıması

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## Tohum Formunun Biyofilik Tasarım İlkeleriyle Sürdürülebilir Seramik Sanatına Yansıması

**Canan SALMAN**

**F. Deniz KORKMAZ**

**Öz:**

Çalışma, doğal alanlara, eylemlere ve varlıklara olan ilgiyi ifade eden biyofili kavramına dayanmaktadır. Genel olarak mimarlık ve iç mimarlıkta yer alan bir kavram olan Biyofili, bu çalışmada sanatsal tasarım için bir kaynak olarak değerlendirilmektedir. Bu nedenle canlı yaşam formu olarak bitkinin, sanatsal seramik formu himayesindeki gelişme süreci; disiplinlerarası bir anlatımla eseri farklı ve özgün kılar. Hegel'in diyalektik anlayışı, Anaxagoras'ın tohum arkhesi ve biyofilik tasarım ilkeleri, tohum formundan ilham alan sanatsal üretimlerle birleştirilmiştir. Böylece bitki ve tohumların yerleştirileceği seramik sanat formları üzerinde bir süreç sanatı oluşturulmuştur.

Sonuç olarak sürdürülebilirlik, süreç sanatı ve biyofilinin kesiştiği noktada biyofilik tasarım ilkeleriyle tasarlanan seramik formlar ortaya çıkmıştır. Doğanın unsurları sanat seramikleriyle bütünleşmiştir.

**Anahtar Kelimeler:** Biyofilik Tasarım, Sürdürülebilirlik, Seramik Sanatı, Tohum

**Abstract:**

The study is based on the concept of biophilia, which expresses an interest in natural areas, actions and entities. Biophilia, which is a theme in architecture and interior design in general, is considered in this study as a source of artistic design. For this reason, the aim of creating a series of works with interdisciplinary expression, thanks to the process phenomenon that will be created by the integrated development of living life forms with art forms, is what makes the work different and original. Hegel's dialectical understanding, Anaxagoras' seed arch and biophilic design principles are combined with artistic productions inspired by the seed form. A process art has been created on ceramic art forms into which plants and seeds are placed. The result is ceramic forms designed with biophilic design principles at the intersection of sustainability, process art and biophilia. The elements of nature are integrated into art ceramics.

**Keywords:** Biophilic Design, Sustainability, Ceramic Art, Seed

## 1. INTRODUCTION

The study emphasized the sustainable impact of nature in indoor living spaces and working spaces, using biophilic design principles to incorporate indirect experiences of nature and elements of place and space. The artworks expressed the intersection of biophilia, arkhe, process art, and sustainability concepts in seed form.

The study explores the concept of biophilic art and artists, focusing on sustainable biophilic design principles in ceramic production. The focus is on the sustainability of life in artistic transformations, with the seed form chosen to reflect this. The study uses Hegel's dialectical theory as a philosophical approach, focusing on the Thesis - Antithesis - Synthesis process. The aim is to create artistic productions that reflect the sustainability of life in the transformation of artistic productions.

This study is developed part of researcher's ongoing PhD Thesis on Biophilic Design and the Expression of Sustainability in Ceramic Forms and Surfaces in the Form of Seeds. It is carried out at Eskişehir Osmangazi University, Institute of Social Sciences, Department of Art and Design. The application part of the proficiency in art thesis was supported by Tübitak 2214-A - International Research Fellowship Programme for PhD Students (1059B142200718) and the ceramic studies were carried out at the ceramic workshops of Politecnico de Leiria Escola de Art and Design ESAD.CR under the supervision of Prof (PhD) Carla Lobo.

## 2. BIOPHILIA AND BIOPHILIC DESIGN PRINCIPALS

The term "biophilia", a concept from the disciplines of psychology and philosophy, is formed by combining the words "bio" and "philia". "Bio" means "alive" or "being alive" and "philia" means "the attraction and positive feelings that people feel towards certain habitats, behaviours and beings in natural life" (Kayıhan, Ozcelik and Unal, 2018:2).

Social psychologist Erich Fromm first coined the term biophilia in 1964 to describe the psychological obsession with focusing on the living and vital and the "psychological orientation of attraction to all living things". Fromm, who explored the concepts of necrophilia and biophilia in his book The Source of Love and Violence, explored these concepts in a clinical sense in his book The Origins of Destructiveness in Man.

The psychoanalyst, who began by explaining the relationship between the instinct to live and the love of life, deciphered the love of life as a passionate love of life and all that lives (Fromm, 1973:12). It is the desire to promote the development of a person, a plant, an idea or a social group. He emphasised that animationism prefers to create new things rather than preserve what already exists. Fromm has embraced the adventure of living more than the outcome.

According to Fromm, whatever happens in the service of life is good. Goodness is respect for all that strengthens life, development and growth. **"**The phenomenon has been called biophilia, defined as the innate tendency to focus upon life and life like forms, and in some instances to affiliate with them emotionally. Human beings sharply distinguish the living from the inanimate. We esteem novelty and diversity in other organisms. We are thrilled by the prospect of unknown creatures, whether in the deep sea, the unbroken forest, or remote mountains" (Wilson, 2002:134). According to him, modern biology has created a truly new way of seeing the world that satisfies the inner focus of biophilia. He says; "In other words, in this rare case, instinct is in tune with reason. The conclusion that I draw is optimistic: as we come to understand other organisms, we will place greater value on them, and on ourselves" (Wilson E. O., 1984:6).

Subsequently, Kayıhan highlighted that this term was popularised by Wilson in his study published in 2018, defining it as "a tendency to focus on life and realistic processes from birth". Biophilic design is an approach to design that integrates nature into living and working spaces, based on the idea of biophilia, which suggests that nature is beneficial to humans.

This study focuses on ceramics that emphasize contact with nature and sustainability through biophilic design principles in artistic production. Changing roles between humans and nature in the Anthropocene era; it emphasizes the importance of protecting nature by understanding the connection between our

environment and our emotions.

Research is being conducted to understand the impact of nature on health and quality of life, with the aim of creating sustainable, natural and healing built environments. People tend to be happier and more productive in green environments, and there is a direct relationship between a person's psychological make-up and their environment (Fromm, 1992:467). Biophilia, a new term in the field, is rooted in the historical use of green elements in homes and urban spaces. Over time, interiors have evolved to incorporate nature and natural elements, influencing materials and forms in the built context (Amirow, 2017:15). Kellert defined biophilic design, embodied in order to provide and evaluate the greatest benefit to people in today's modern environment, with eight biophilic values that are directly related to human health and well-being in terms of resources. These values are affection, attraction, aversion, control, exploitation, intellect, symbolism and spirituality (Kellert 2012, cited Kellert, 2018;13-14).

According to Çorakçı, biophilia manifests itself in several ways, including human perception, behaviour, and attitudes towards diverse species and the natural environment. The natural world's diversity of shapes, colours, and appearances is widely valued. Positive and appealing sentiments are linked to the desire to preserve life. Positive feelings elicited by particular influences, such as affection for round-faced, big-eyed baby creatures, the allure of bright flowers and birds, and interest with the sight of a forest with a waterfall, are seen as major indicators of biophilia. Furthermore, these overt or covert human responses and interactions represent the material, emotional, and psychological connections we have with the natural environment (Çorakçı, 2016:11-12).

Kellert's biophilic design principles, based on six dimensions, are universally present and contribute to human flourishing, although their content and priority varying based on individuals' backgrounds, experiences, and cultures.
• Environmental features
• Natural shapes and forms
• Natural patterns and processes
• Light and space
• Place-based relationships
• Evolved human-nature relationships (Kellert, 2008:6).

These dimensions have been simplified and formulated as a condensed list of criteria under the heading 'Experiences and qualities of biophilic design' (Table 1).

| DIRECT EXPERIENCE OF NATURE | INDIRECT EXPERIENCE OF NATURE | EXPERIENCE OF PLACE AND SPACE |
|---|---|---|
| Light | Images of Nature | Expectations and Housing |
| Air | Natural Materials | Order and Complexity |
| Water | Natural Colors | Integration of Parts into Whole |
| Plants | Natural Shapes and Forms | Transition Spaces |
| Weather forecast | Evoking Nature | Mobility and Wayfinding |
| Natural Landscapes and Ecosystems | Wealth of Knowledge | Cultural and Ecological |
| | Traces of place, change and time | Attachment to Place |
| | Natural Geometries | |
| | Biomimicry | |

**Table 1.** Experiences and qualities of biophilic design **(Boz, 2019:37)**.

## 2.1. BIOPHILIC DESIGN and SUSTAINABILITY THROUGH SEED

The concept of sustainability, which literally means continuity, was first expressed as "meeting economic, environmental and social needs without compromising the ability of future generations to meet their own needs" in the 1987 report of the United Nations Brundtland Commission (Karslı, 2008:6).

Sustainability aims to maintain the continuity of the ecosystem, including living beings, humans, and inorganic units, while ensuring the provision of natural resources for future generations. According to Öztürk, "Sustainability can be defined as the ability to be permanent in general and its most basic

purpose is to develop and realise the idea of sustainable development. Sustainable development is basically an effort to increase the level of economic growth and prosperity by protecting the environment and the quality of life of all people in the world" (Öztürk, 2014:3).

"Biophilia", a birth story parallel to the concept of sustainability created by environmental and economic conditions, was proposed by Erich Fromm in the 1960s. The concepts of 'biophilia hypothesis' and 'biophilic design', developed and presented by Edward Osborne Wilson and Stephen Kellert, continued in the 1970s and date back to the 1980s.

Sustainability encompasses social, environmental and economic dimensions, and is studied primarily in ecology, economics, philosophy, law, the humanities and the arts. Its philosophical aspect is crucial for artistic productions, demonstrating its multifaceted nature beyond ecology or social biology. Philosophy explores sustainability from various perspectives, including ethical, social justice, environmental, and epistemological approaches and the equitable use of resources and sustainable economic growth. (Karslı, 2008:16). This study explores sustainability as a cyclical in philosophy, focusing on the immanence and transcendence of change, transformation, or dialectical approach.

Emanuele Coccia, one of the philosophers of the new era, adopted Anaxagoras' approach of "everything is in everything" in this context. Anaxagoras described sustainability in the healthiest way with the concept of immersion. "The world is not a place, it is the immersion of each thing in the other; this mixture reverses the topological inseparability relationship moment by moment" (Coccia, 2021:82). The expression "everything is in everything" expresses a mutual penetration rather than a sequential vicious circle. We cannot say that it is birth that initiates the transformation, but death is the finisher. In addition, the reference to sustainability in terms of the meaning of Heraclitus' movement has also been considered as a natural source of reference. However, in this study, sustainability will be examined in the context of thesis, antithesis and synthesis through Hegel's dialectic, not the way it is directly treated.

The concept that comes to mind when Hegel is mentioned is directly dialectical philosophy. However, Heraclitus, who formed the infrastructure of dialectics and was an earlier philosopher, contributed greatly to this connotation. The dialectical way of thinking began with Heraclitus before Hegel. Heraclitus laid the foundation of dialectics with an intellectual structure that was far ahead of his time (Aslan E. 2017:5). Heraclitus's concept of change emphasizes the constant change and metamorphosis in the universe. He used the phrase "You can't bathe in the same river twice" to illustrate this. Even if we enter the same river due to water circulation, it's not the same. This approach forms the basis for Hegel's dialectic, revealing the principle of movement, which is the first law of change.

Ancient philosophers like Heraclitus introduced dialectics to thought dynamics, but until Hegel, it was primarily seen as a method of discussion. Heraclitus emphasized the intertwining of opposites, while Hegel developed the structure of thesis and antithesis, which must come together for synthesis, defining the three moments of dialectic within the process idea. The stages do not follow one another, nor are they separated from one another; in ascending to the upper level, the lower level is simply abandoned (D'hondt, 1994:78).

If we shift the thought process to metamorphosis, being goes from being in itself to overflowing from itself and then to metamorphosis (differentiation). Finally, it comes back to itself and transforms again, thus evolving. Seed metamorphosis into fruit transformation into multiple plants forms a spiral cycle, promoting continuity, transmission, and sustainability in cultural life and the ongoing cycle of existence.

Throughout history, seeds have been valued for their sustainability and role in cultural transmission. They have been transferred through trade, but their ability to germinate must not be lost. Ceramic amphoras were used to protect seeds during ship transport. (Images 1 and 2). Seeds representing life forms were valued in ceramic forms in the works of art produced.

**Image 1**. Canan Salman "Seeds transported by trade". Portugal Lisbon Maritime Museum


**Image 2**. Canan Salman "Ceramic containers used for transport" Portugal Lisbon Maritime Museum

Black pepper seeds found in the hull of a shipwreck 17.yy. It is an example that shows us how long a seed can last by maintaining the potential inside it (Images 3 and 4)

**Image 3.** "Items and seeds found on the shipwreck" Portugal Lisbon Maritime Museum

**Image 4.** "Pepper and coconuts Seeds found on the shipwreck" Portugal Lisbon Maritime Museum

Nature's transformations inspire art, with the seed being a prime example. The seed ensures the continuation of its life form and transmits its potential from generation to generation. Its passive structure requires the necessary environment for germination and becoming part of life. The seed can disperse into its natural environment and move to a new plane with the help of the plant's power and instinct. This unique form of art reflects the power and instinct of nature.

Stefano Mancuso's book "The Plant Revolution" explores the unique physical characteristics of seeds, which can propagate their species far from their origin, despite lacking a muscular structure. Mancuso discusses the tools and behaviors plants use for reproduction, their memory, sustainability, and resistance to environmental stimuli.

After the invention of cinema in 1896, the botanist Wilhelm Friedrich Philipp Pfeffer made the first time-lapse film. The movements of leaves and stems against gravity, the exploration and ground movements of the under ground root became visible (Mancuso, 2018: 32). With this possibility of observation, it was recognised that plants have an identity beyond being something pleasant and aesthetic.

Seeds, with their feathered wings, are able to sustain themselves by regenerating themselves when left to their own devices. They transmit biological species characteristics, cultural richness and sustainability. Seeds are passed on through the hands of women, and in Anatolia were an important part of a bride's dowry. Nomadic women took seeds from the fruits of their land and brought them to new areas, demonstrating the importance of seed-related transmission in different societies (Arman, 2018).

The Life Tree, symbolising sustainable living, is an important aspect of Japanese culture. The princess tree, a paulownia tree, was once a traditional gift for a baby girl and a chest of drawers for her wedding. This tree life form allows new seeds to enter the cycle, demonstrating the importance of sustainability (Ballard, 2016). The concept of sustainability as a worldview is loaded with the meaning of using what we have without harming the living conditions of future generations, and replacing what we use with new things.

## 3. BIOPHILIC ART AND BIOPHILIC ARTISTS

Biophilic art, inspired by nature, connects individuals with the natural world, enhancing well-being and connection with the environment. Biophilic design principles integrate natural elements into spaces, defining biophilia by biologist E.O. Wilson. Biophilic art, utilizing painting, sculpture, and installation, brings nature indoors, promoting well-being and environmental awareness. Research shows that contact with nature supports mental health, and this art form not only develops artistic insight and aesthetics but also promotes mental health through environmental awareness. “Biophilic arts and craftmanship proffer an enhanced sensory experience - through light, texture, density, radiant temperature and visual complexity- in a way that is not as easily attainable or practical at a larger spatial scale” (Browning & Ryan, 2020:49).

Biophilic art fosters a connection with nature, promoting environmental awareness and a healthier environment. It combines natural elements with artistic expression, bridging the gap between urban and wilderness environments. It serves as a refuge for our senses and a reminder of our symbiotic relationship with the earth (Awais, 2023).

Biophilia is a key to personal restoration because it promotes connection with life. Nature enhances experience, mood and happiness through its organic forms, which engage the mind, and its repetitive, self-similar patterns, called fractals, which our visual system processes with ease and pleasure. Environmental psychologist Stephen Kaplan and physicist Richard Taylor further explain this relationship (Frazier, 2020).

Emma Robertson, a biophilic artist, uses three-dimensional installations and short films to challenge pessimism about climate change. Her 27 mixed media drawings of endangered plants highlight the beauty of nature and its connection to us. Robertson's work encourages a connection with nature and the potential loss of herbarium collections and the wild. The Archaeology of Absence features drawings of endangered plants and fossil wood on paper, symbolising urban environments and maps (Image 5). The artist emphasises the need for human integration with nature, citing research on biophilia and ecopsychology that shows positive effects on physical and mental health. Robertson believes that we are not separate from nature and that exploring plant imagery can create emotional empathy and bring us back to ourselves (Robertson, 2017).

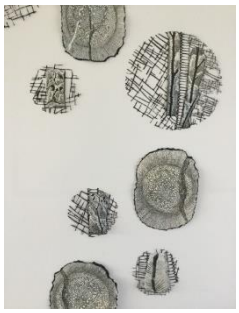

**Image 5.** *Living Fossils: The Shape of Loss* (series), Drawn Thread, Australian National University, Canberra, 2017.

**Image 6.** Cheryl Coon “Germs series” Sculpture Steel and Fiber, http://www.cherylcoon.com/sculpture.html

The artist, inspired by her California kayaking and fishing experiences, creates sculptures based on biological forms like algae, protozoa, and bacteria, representing natural geometry and recurring patterns in nature.

The small black sculptures are made of barbed steel tied or welded together in clusters (Image 6). Some were placed by throwing objects against the wall. This chaotic method of installation reflects our inability to control natural phenomena, despite our scientific efforts to replicate and exploit biological organisms (Coon, 2023).

Artist and designer Robert Remer, like all biophilic artists, explores the relationship between humans and nature as a grand narrative. In his studio productions, he creates biophilic designs by combining man-made materials with plants to create furniture, sculpture and wall art. (Images 7,8,9,).

Image 7. Robert Remer, "Biophilia" https://image.27east.com/2021/04/Robert-Remer-Night-2-scaled.jpg

Image 8. Robert Remer, "Biophilia" https://image.27east.com/2021/04/Robert-Remer-Day-6-scaled.jpg

Image 9. Robert Remer, "Biophilia" https://image.27east.com/2021/04/Robert-Remer-Night-4-scaled.jpg

Biophilic design connects man-made spaces with nature, fostering a closer connection even indoors, unlike traditional sculpture and furniture, which are constantly in motion."The owner or curator is as much a part of the work as the artist," says Remer. "It's an ongoing relationship between you and the work."He adds that, on a practical level, caring for a biophilic artefact is similar to caring for a houseplant (O'Reilly, 2021).

Melinda Hurst Frye is a photographer who uses a flatbed scanner to capture the ecology of the Pacific Northwest and the cycles of the forest floor. She uses her own vision as a camera and shares her discoveries through observation and image-making **(Frye).** Frye's art utilizes a pattern-based topographical matrix to represent the natural world, blending natural imagery with man-made materials, sometimes transforming them into abstract forms, focusing on subtle natural systems.

**Image 10.** Melinda Hurst Frye, "The Forest Floor" https://www.mhurstfrye.com/the-forest-floor.html

### 3.1.CERAMIC ARTISTS WHO USE THE SEED FORM in THEIR WORKS

Sarah Rayner, a sculptural artist from Australia, draws inspiration from the cyclical metamorphoses in native plants, particularly the reproductive organs (Gynoecium) of flowers, which transform into fruits and seeds (Rayner, 2021). Rayner uses porcelain as a medium to reveal sensory space and fissures, highlighting the decay and vital cycle of the earth through its association with purity, aristocracy, luxury, and value (Images 11 and 12).

**Image 11**. Rayner's work in progress

**Image 12.** Rayner's work in progress

**Image 13.** Sarah Rayner, *"Flowerbones Instalation",* 2018

The artist's practice showcases the fragility and balance of the natural world, using the unique colour and texture of porcelain to reflect details of form and light effects, using simple material expression without colour (Image 13).

Alice Ballard, a ceramic artist, uses seed shells as a starting point for her studies, incorporating the

metaphorical protection of the uterus from femininity (Image 14). She believes that the combinations that can be created by combining different elements of size, shape, texture and colour are endless. (Ballard, 2016). Ballard's journey begins with a branch of the Royal Empress Tree, also known as the Royal Paulownia Tree, containing a cluster of seeds. ( Image 15).

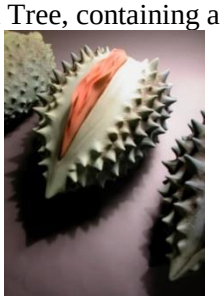

**Image 14.** Alice Ballard, "Seed"

**Image 15.** Royal Paulownia Tree

The heart-shaped purple inflorescences of a fast-growing tree in China, often found by the side of the road, make a sound like a shaman's rattle when shaken. The shape of the tree was a key inspiration for a year-long journey, and a prototype was created using the shape of the seed pod (Images 16 and 17).

**Image 16.** Alice Ballard's work in progress www.aliceballard.com

**Image 17.** Alice Ballard's work in progress www.aliceballard.com

Ballard said about her work: "The visual effect that the work had when placed in the gallery revealed the mixture of strength and softness and became the main part of the exhibition. This was the beginning of my love affair with the "Pod" form and all its subsequent evolutions. I was immediately impressed with all the incredible possibilities that small and large groupings can have in one space" (Ballard, 2016). Despite their similarity, the unique stories, colours and textures of each unit, when placed side by side, embody the sustainability mission of seed capsule production.

Nature possesses properties such as starting a process or being the outcome at the end of an existing course. About Andy Rogers, who reflects cyclical mobility in her work thepolymerarts.com "when something in nature opens up to reveal its treasure, it's usually something to do with its survival; it's the seeds inside a shell, the pearl in an oyster shell, the brightly colored interior and/or organs in a flower," Varon wrote on his blog (2014).

However, Varon also emphasizes that we should focus on what Rogers wants to show us. With the use of color and texture in the works, it invites you to think both about the aesthetics in the forms and about the mystery it hides inside (Image 18).

**Image 18**. Andy Rogers, "Clam Seed"

Karen Millar's art explores the natural world's beauty and evolutionary power, highlighting human influence and the relationship between growth, decay, loss, hope, and vulnerability. She appreciates the details in nature, including visible parts, protective elements, and prickly appendages (Images 19, 20, 21, 22). The process of creating the work uses different materials because it offers results beyond what is expected, but she prefers clay especially because of the possibilities and tactility of the material. Clay

also provides strength by adding a residue-like quality to the work **(Millar, 2022).**

**Image 19.** Karen Millar, "Pod Series

**Image 20.** Karen Millar, "Pod Series"

**Image 21.** Karen Millar, "Pod Series"

**Image 22.** Karen Millar, "Pod Series"

Jenni Ward is a ceramic sculptor and installation artist who draws inspiration from the natural world. She focuses on biological forms such as nests, seeds, bones, lichens, beehives and sprouts and seeks to create a sense of space through the connection between these forms and the natural system. The artist uses a technique to enhance the textural depth of the work's surface, inspired by seed shells found in the forest, capturing an unidentified new life form (Images 23 and 24).

**Image 23.** Jenni Ward, *"Seed Series"*, Ceramic Hand Shape

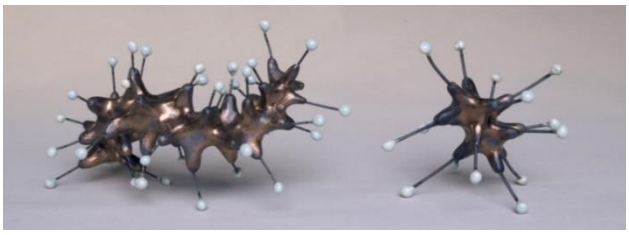

**Image 24.** Jenni Ward, "Sprouting Series" Ceramic Hand Shaping and heat resistant Metal

The artist studies new life forms and creates temporary placements in nature. Exhibiting in museums, galleries, forests, deserts and shipwrecks, she uses science, the environment and art to raise awareness of the need to protect natural habitats (Ward, 2022).

Lindsay Feurer, an artist who focuses on life forms, is inspired by the emergence of seeds and focuses on critical parts of life, highlighting the emergence of living organisms in nature (Image 25). Feurer's art explores organic growth, reproduction and movement, using clay to create evolving forms that combine natural elements and demonstrate the expressive potential of clay in life. "She expresses that biological imagery reflects the perfect integration of form and function found in the natural world with deliberately ambiguous combinations. Through an intuitive process I allow these elements to react to each other, creating hybrid forms with movement and fluidity." (Naylor, 2014).

With her unique technique, she allows his sculptures to exist in a perfect field of illusion where they seem to be 'born' rather than 'made'. Thus, the pieces made with inspiration from the mystery in nature make the biological one look fantastic(Images 26, 27, 28).

**Image 25.**

Lindsay Feurer, *" Miniature Series"*

**Image 26.**

**Image 27.**

Lindsay Feurer, *"Hibrid Cluster*

**Image 28.**

Lindsay Feurer, *"Hibrid Mergence"*

### 3.2. SUSTAINABLE CERAMIC WORKS FROM SEED FORM with BIOPHILIC DESIGN PRINCIPLES

The researcher analysed her experience of making ceramics and applied biophilic design principles to her work. She used seed shapes and clay to create structures and textures that emphasised material

support and protected the seed's identity. The study began by collecting natural materials and studying their form, texture and colour characteristics (Images 29-32).


**Image 29.** Canan Salman,*"Bottlebrush plants (Callistemon)"*


**Image 30.** Canan Salman,*" Acorn Tree Seed and Seed Capsules"*


**Image 31.** Canan Salman,*" Brasillian Eucalyptus "*


**Image 32.** Canan Salman,*" Magnolia Tree Seed and Seed Capsule"*

The study evaluated seed capsules' protective structure and sustainability, focusing on form designs with unit format repetition and size variation (Images 33 and 34).

**Image 33.**Canan Salman *"Sustainability"Hand Shaping 1040ºC, h=15 cm*

**Image 34.** Canan Salman *"Sustainability"Hand Shaping 1040ºC, h=17 cm*

Horse chestnut and flaxseed seeds have been stylized and seed forms that will be integrated with living life forms separate from the whole have been studied (Images 35-41).

**Image 35.** Canan Salman *"Seed 1"* Hand shaping 1040ºC, 15x7 cm

**Image 36.** Canan Salman "Seed 2" Hand shaping 1040ºC 15x7 cm

**Image 37.** Canan Salman *"Seed 3"* Hand shaping 1040ºC, 15x7 cm




**Image 38.** Canan Salman *"Seed 4"* **Image 39.** Canan Salman *"Seed 5"* **Image 40.** Canan Salman *"Seed 6"* **Image 41.** Canan Salman *"Seed 7"*
Hand shaping – glazed 1040ºC, Ø= 10 cm

As a reference source for the texture and form divisions used in the seed series studied, recently James R. Biss with macro photography seed photos (Biss, 2021) found in the book "The Hidden Beauty of Seeds & Fruits The Botanical Photography of Levon Biss", consisting of seed photos taken by photographer Levon Biss (Image 42) and Seed photographs taken by Jonas Frei (Image 43). As a naturalist, illustrator and landscape architect who was awarded the Jewet Award, were used (Ebert, 2023).

**Image 42**. Levon Biss, *"The Hidden Beauty of Seeds & Fruits The Botanical Photography of Levon Biss"* (Biss, 2021)

**Image 43.** Jonas Frei, *"Seeds",* (Ebert, 2023)

Seed formations are closed due to their protective properties, affecting both the seed and the capsule. Germination takes place inside the seed. The first stage aims to simplify the seed forms, resulting in a spherical shape, to create a common language of expression (Image 44).

**Image 44.** Canan Salman "Work in proggress"

The spherical shapes of the seeds are designed to represent nature and to maintain the plant's roots by spraying or dripping. A series of twenty different seed interpretations, supported by a common form,

textures and colour studies (Images 45-64).

**Image 45.** Canan Salman "One of twenty seeds" 1200 ºC Stoneware Chamotte Clay Hand Shaping Ø=10 cm

**Image 46.** Canan Salman "One of twenty seeds" 1200 ºC Stoneware Chamotte Clay Hand Shaping Ø=10 cm

**Image 47.** Canan Salman "One of twenty seeds" 1200 ºC Stoneware Chamotte Clay Hand Shaping Ø=10 cm

**Image 48.** Canan Salman "One of twenty seeds" 1200 ºC Stoneware Chamotte Clay Hand Shaping Ø=10 cm

**Image 49.** Canan Salman "One of twenty seeds" 1200 ºC Stoneware Chamotte Clay Hand Shaping Ø=10 cm

**Image 50.** Canan Salman "One of twenty seeds" 1200 ºC Stoneware Chamotte Clay Hand Shaping Ø=10 cm

**Image 51.** Canan Salman "One of twenty seeds" 1200 ºC Stoneware Chamotte Clay Hand Shaping Ø=10 cm

**Image 52.** Canan Salman "One of twenty seeds" 1200 ºC Stoneware Chamotte Clay Hand Shaping Ø=10 cm

**Image 53.** Canan Salman "One of twenty seeds" 1200 ºC Stoneware Chamotte Clay Hand Shaping Ø=10 cm

**Image 54.** Canan Salman "One of twenty seeds" 1200 ºC Stoneware Chamotte Clay Hand Shaping Ø=10 cm

**Image 55.** Canan Salman "One of twenty seeds" 1200 ºC Stoneware Chamotte Clay Hand Shaping Ø=10 cm

**Image 56**. Canan Salman "One of twenty seeds" 1200 ºC Stoneware Chamotte Clay Hand Shaping Ø=10 cm

**Image 57.** Canan Salman "One of twenty seeds" 1200 ºC Stoneware Chamotte Clay Hand Shaping Ø=10 cm

**Image 58.** Canan Salman "One of twenty seeds" 1200 ºC Stoneware Chamotte Clay Hand Shaping Ø=10 cm

**Image 59.** Canan Salman "One of twenty seeds"1200 ºC Stoneware Chamotte Clay Hand ShapingØ=10 cm

**Image 60.** Canan Salman "One of twenty seeds" 1200 ºC Stoneware Chamotte Clay Hand Shaping Ø=10 cm

**Image 61.** Canan Salman "One of twenty seeds" 1200 ºC Stoneware Chamotte Clay Hand Shaping Ø=10 cm

**Image 62.** Canan Salman "One of twenty seeds" 1200 ºC Stoneware Chamotte Clay Hand Shaping Ø=10 cm

**Image 63.** Canan Salman "One of twenty seeds" 1200 ºC Stoneware Chamotte Clay Hand Shaping Ø=10 cm

**Image 64.** Canan Salman "One of twenty seeds" 1200 ºC Stoneware Chamotte Clay Hand Shaping Ø=10 cm

The 20 Seeds series uses chamotte clay with fine stones to capture the natural texture in the shapes created. Plaster moulds are used to create spheres with different textures and voids, allowing nature to show itself. Clay, a natural environment for plants, is used for its sculptural properties. The spherical shapes, 10 cm in diameter, bring nature into the home and are designed to be mounted on the wall. The biophilic effect of the seeds creates a sense of happiness and sustainability, even in small interiors. This serie, emphasise that creating space for nature in built spaces does not require square metres, and the forms can be used both on the stand and hanging on the wall.

The second phase of the series, Microcosmos, is a series that allows nature to display itself. Inspired by David Latimer's creation of the oldest terrarium painting in 1960, Latimer created a terrarium using water and compost in a ten-gallon bottle. He placed spiderwort seeds in the jar, sealed it and placed it in a sunny corner, allowing nature to work through photosynthesis (Image 65). Based on the example of a microcosm that was created in 1960 and has not been opened since 1972. The idea of creating arrangements that combine art ceramics, sustainability and biophilic design elements was born as a result of bringing together ceramic production and living forms (Eberhardt, 2023).

This project aims to develop a design that allows living plants to survive and communicate with their environment and space, as well as incorporating process art and practical seed germination spaces. This design incorporates biophilia, art, arche, process art and sustainability through ceramic forming processes. The open spaces of the capsule were used for germination. Chia seeds are hydrophobic and require only a small amount of water to build their structure.

The work, called Microcosmos 1, combines sustainability and biophilic design elements in a structure that allows living plants to grow in the process of indirectly experiencing nature and space. Living elements are part of the art form. The differences created by the growth of the plant will allow the process art to come into play. For this reason, care has been taken to ensure that the seeds to be germinated have an area where they can be comfortably placed in the form studied.

**Image 65.** David Latimer "the world's oldest terrarium" (Eberhardt, 2023)

**Image 66**. Canan Salman, "Microcosmos1" Stoneware and Glass with Chia Seed, Hand Shaping-1200°C Glass Slumping- 750°C Dimension: Ø=9 cm h= 8 cm

**Image 67.** Canan Salman "Sustainability 1" White Clay, *Hand Shaping 1040ºC, h=17 cm*

A protective glass dome is placed on the outside of the ceramic mould to achieve the microcosm effect. This creates a sustainable and biophilic microcosmic environment with its own atmosphere. The concept of sustainability has been evaluated in the ceramic form from two different perspectives. The modules that make up the form reflect sustainability from a structural point of view. Seeds placed in capsules as a living life form also express the sustainability of life (Image 66). A protective glass dome was placed outside the ceramic form to achieve the microcosm effect. Thus, a sustainable and biophilic environment with its own atmosphere is created (Image 67). The design consists of seed capsules with a sustainability concept. The open spaces of the capsules are utilized as plant growing areas (Image 68).

**Image 68.** Canan Salman " Sustainability Detail" "Placing seeds on a ceramic form"

2. day

4.day

7. day

10.day

**Image 69.** Canan Salman "Seed monitoring process after seed placement"

The day of 1 The day of 3 The day of 5 The day of 7

**Image 70**. Canan Salman "Seed monitoring process after seed placement"

**Image 71.** Canan Salman"Sustainability 2" Hand shaping 1020ºC glazed

The concept of sustainability was evaluated in the ceramic form, from two different perspectives. The modules that make up the form are intended to reflect sustainability from a structural point of view. The ceramic form was monitored at regular intervals to ensure a lasting artistic composition (Images 69,70). The seeds placed inside the capsules also express the sustainability of life (Image 71).

**Image 72.** Canan Salman"Microcosmos 2" Hand shaping 1200ºC stoneware, unglazed, Dimension: 17x11 cm h=4 cm

The work, called Microcosm 2, is designed to allow nature to manifest itself too. The ceramic form and the eclectic life forms, representing the earth as an earth form, have been used to establish a symbiotic relationship order at the microcosmic level within itself.

## 4. CONCLUSION

Nature is a valuable resource for art and scientific research because of its constant movement and diversity of natural objects. Art and science are influenced by the interpretation of these forms and

structures created by natural processes. Plastic touches applications have been carried out to evaluate the closed structure and surface texture properties of seed forms, in some creating gaps applications involving by supporting texture.

Formally, the starting point of the skill in this work of art is taken from the seed form. The conceptual starting point is also taken from the philosophical problems of the arch and from Anaxagoras' "spermata" seed cause. The sustainability of the seed concept was supported by the philosophy of Heraclitus and Hegel. From the principles of biophilic design, which are the basis of the artistic works performed, the contexts of direct experience of nature, indirect experience of nature and experience of nature as space have been used. The study explores the indirect and direct experience of nature through the study of seed forms and their textures and colours. By integrating art forms with living life forms, the designs follow the principle of experiencing nature as space. The experiences have been evaluated in the context of plastic problems in ceramics, focusing on the transformation of natural forms into art forms and the creation of a plastic language to convey the researcher's experiences.

While the theme of the study was considered and evaluated with applications, the nature-artist relationship, artistic insight, perceptual mechanism, personality and approach to the theme of the work, as well as the works of artists who have works that are examples of the theme of working in abstraction and metaphor were also considered and studied. The works produced as part of the study were created by interpreting and abstracting the selected seed forms. The plastic analyses that have emerged from the use of ceramic forming methods have brought with them different plastic tensions. These tensions can be defined as the meeting of texture, form, structure and technique, sometimes with different intensities at the same time.

The studies used clay developed at low and high temperatures and seeds as complementary elements. They were completed by changing direction and reworking, forming new relationships through abstraction. The reflection of the seed form was present in all parts, ensuring the integrity of each study's effect. The researcher promotes the language of art and spiritual well being through her ceramic work, incorporating earth wisdom and sustainability. Designs' colour, texture and form, evoking rebirth and transformation, provide a direct expression of these processes. This empowering way of expressing life forms allows us to notice processes that we don't think about in our daily lives.

Clay, as the primary language of expression, serves as an environment for self-renewal. Ethnic language, used in study, renews and sustains this environment. Clay can be transformed in all conditions and is strengthened by firing, taking on a permanent form. Living forms, on the other hand, represent the movement of life, uniting body, mind, matter and idea in a fragile balance. The concept of the fired state of the earth provides life-sustaining space, while its pure state creates life. These interrelated media serve as unique tools for expressing experiences and memories, allowing living substances to absorb and express these experiences.

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## GENİŞLETİLMİŞ ÖZET

Sanat, doğa etiği ve sürdürülebilir çevre bilinci oluşturmak için sanatçı ve toplum arasında bağ kurulmasına nasıl bir imkân sağlar?

Kurulan bağ, sanat eserine nasıl konu olur?

Bu nedenle biyofilik tasarım parametrelerinden yararlanılarak; biyofili kavramı ile arkhé problemi, sürdürülebilirlik bağlamında sanatsal üretimde kaynak olması ve bu amaçla eser üretiminde çıkış noktası olarak tohum formunun ele alınıp geliştirilmesi hedeflenmiştir.

Biyofili, öteden beri getirdiğimiz yaşam anlayışımızın ürünüdür. İnsanların birçoğunun yeşil bir çevrede daha mutlu ve üretken olmasını sağlayan etkisi ile tasarım alanında yeni bir başlıktır. Aynı zamanda doğanın iç mekana taşınarak; insanda sürdürülebilir iyi olma halini sağlayan bir yaklaşımdır. Biyofili ve biyofilik tasarım üzerinde yapılan araştırmalar, artan küresel iletişim sayesinde son zamanlarda ivme kazanmıştır. Sağladığı geniş fayda, biyofilik tasarımın hastanelerde, okullarda ve işyerlerinde kullanılmasına neden olmuştur. Tasarım ile ilişkili her alanda da yer almaya aday olan biyofili kavramı, biyofilik sanat alanında da varlığını gösterir.

Doğadaki biçimler, doğrudan yorumlanabildiği gibi bu biçimler doğal ortamda aldığı yer ya da doğal süreçler değerlendirilerek de sanata konu olur. Tohumun filizlenip bitkiye dönüşüp büyümesi, gelişmesi, ölmesi ve yeniden tohuma dönmesi süreci de kendine özgü yere sahiptir. Bu nedenle yaşamın sürdürülebilir yanının ifadesi için çıkış noktası olarak tohum formu seçilmiştir. Kavramsal çıkış noktası da felsefi arkhe problemlerinden; Anaksagoras'ın "spermata" tohum nedenidir. Tohum kavramının sürdürülebilirliği Herakleitos ve Hegel felsefesi ile desteklenmiştir. Gerçekleştirilen sanatsal çalışmalara temel olan biyofilik tasarım ilkelerinden doğayı doğrudan deneyim, doğayı dolaylı deneyim ve mekan olarak doğa deneyimi ilkelerinden faydalanılmıştır. Bu nedenle de biyofilik tasarım parametrelerinden yararlanılarak; biyofili kavramı ile arkhé problemi, sürdürülebilirlik bağlamında sanatsal üretimde kaynak olabilir. Bu amaçla eser üretiminde çıkış noktası olarak ele alınıp geliştirilmiştir. Tohum formu, biyofilik tasarım ilkelerinden faydalanarak; sürdürülebilirlik bağlamında sanat seramiği üzerinden ifade edilmiştir. Canlı öğeler sanat formunun bir parçası haline getirilmiş ve bitkinin büyümesinin getirdiği farklılıklar da süreç sanatının devreye girmesini sağlamıştır. Sanatsal estetiğin değişimi ve sürdürülebilir özelliğini de göstermek amaçlanmıştır. Biyofilik tasarım ilkelerinin, sürdürülebilir seramik sanatı oluşturmada nasıl kullanılabileceği ortaya koyulmaya çalışılmıştır. Yeni bir kavram olan biyofilik sanat bağlamında; doğanın kendini sergilemesine imkân veren seramik form tasarımların, devam edecek çalışmalarda temel olacak bir bakış açısı ile kaynak olması düşünülmektedir.