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Terrariums as a nature-based art therapy for psychoterratic syndrome and solastalgia in the age of climate change

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Abstract

This article aimed to evaluate the therapeutic potential of closed-system plant terrariums as a nature-based art therapy intervention for addressing psychoterratic syndromes—particularly solastalgia—arising from climate change-related environmental distress. A narrative and conceptual review of the literature on nature-based therapies, nature-based art therapy, eco-art therapy, and psychoterratic syndromes was conducted. In addition, a structured group workshop model utilizing the closed-system plant terrarium technique was developed based on theoretical frameworks and existing empirical evidence. Findings suggest that nature-based art therapy interventions facilitate emotional expression, ecological identity development, emotional regulation, and group connectedness. The closed-system terrarium technique offers a symbolic and sensory-rich medium that supports therapeutic distance, emotional containment, ecological hope, and active engagement with environmental grief and eco-anxiety. Closed-system plant terrariums represent a feasible, low-cost, and innovative nature-based art therapy approach for both clinical and preventive mental health contexts. Although indirect evidence supports its therapeutic value, further qualitative, quantitative, and mixed-method research is needed to establish its effectiveness specifically for psychoterratic syndromes and solastalgia.

Keywords: Terrarium, art therapy, solastalgia, psychoterratic syndrome, climate change

Introduction

Following the Industrial Revolution, rapid urbanization and technological advancements weakened the human–nature connection, a trend that has progressively deepened over time (1-3). Today, with approximately 80% of the global population residing in metropolitan areas, adverse living conditions have further diminished this connection (4). The physiological and psychological detriments of nature disconnection have been well-documented (4-7). Attention Restoration Theory, Stress Recovery Theory, and Biophilia Hypothesis collectively explain that nature gently draws attention, thereby reducing cognitive fatigue, acting as a buffer against stress, and that failure to meet the evolutionarily ingrained "need for proximity to nature" can lead to psychological distress (8-10).

Humans not only are influenced by nature but also exert profound impacts upon it, with climate change representing one of the most striking examples of this reciprocal relationship. Human-driven climate change has exceeded the adaptive capacity of many ecosystems, producing a range of adverse consequences, from acute weather events to chronic stressors, food insecurity, and forced migration (11-14). Within this process, disadvantaged groups and young people have been particularly affected, experiencing mental health challenges encompassed within eco-emotions and the psychoterratic syndrome (15-17). Concepts such as eco-anxiety, eco-grief, eco-paralysis, eco-hope, eco-anger, eco-guilt, and nature-deficit disorder have been defined in this context (15). The term "solastalgia," introduced in 2003 by Glenn Albrecht, is closely linked to these constructs, describing the simultaneous feeling of loss associated with the transformation and degradation of one's home environment, and can thus be related to psychoterratic syndrome (18). These escalating challenges have underscored the need for preventive practices and action plans in community mental health (14,19,20). In the literature, cognitive-behavioural and psychoanalytic approaches, grief therapy, group sharing, existential therapy, acceptance and commitment therapy, and art therapies are among the prominent interventions (21,22). Particularly in interventions targeting eco-anxiety, engaging in meaningful pro-environmental actions has been shown to reduce anxiety (23,24). Approaches that address anxiety and alleviate hopelessness are reported to be more effective than those focusing solely on behaviour change (Pinsky et al., 2020). Within this framework, nature-based art therapies integrated with behaviour change models gain significance (16, 25). Ecotherapy, nature-based art therapy, and eco-art therapy (26, 27) offer opportunities for the non-verbal expression of thoughts and emotions in a safe environment, while re-establishing the human–nature connection (28, 29). Among these methods, the plant terrarium technique creates a small ecosystem in a glass container using natural materials, facilitating renewed human–nature interaction (30, 31). The distinctive feature of closed terrariums—their ability to continue growing independently of their creator ("outlive me" experience)—may differentiate them from other eco-art practices (30-32).

This study specifically addresses the following questions:

1. What therapeutic benefits do closed-system plant terrariums provide in nature-based art therapy for addressing psychoterratic syndromes, such as solastalgia?
2. What factors influence the implementation and effectiveness of terrarium-based interventions in mental health contexts?

Clinical and research consequences

1. Nature-based therapeutic interventions

The growing number and variety of nature-based therapeutic interventions are increasingly being applied both in the rehabilitation of individuals with psychiatric diagnoses and within preventive mental health services (33, 34). High-quality evidence has demonstrated that nature-based therapies—such as wilderness therapy, ecotherapy, horticultural therapy, and forest therapy—support well-being (34). Their positive effects across all age groups and in diverse contexts confirm that nature-based therapies hold unique value and impact at every stage of development (35). The integration of nature-based therapeutic interventions with art therapy represents an emerging field of practice, as art therapists have begun to embrace the value of working in natural settings and to incorporate nature into their workspaces and techniques. In other words, the concept of "nature," once primarily a metaphor within therapeutic directives, has gradually entered the therapeutic space in its tangible form (36). However, no high-quality evidence has yet been found specifically for the field of eco-art therapy. Table 1 presents the various types of nature-based therapeutic interventions.

Table 1. Nature-based therapeutic interventions (37-39).

Nature-based therapeutic interventions	
Forest based interventions	Forest therapy (Shinrin-ryoho)
	Forest bathing (Shinrin-yoku)
Gardening based interventions	Horticultural therapy
Wilderness based interventions	Wilderness therapy
	Adventure therapy
Animal based interventions	Animal-assisted therapy
	Care farming
Others (non-specified)	Nature-based art therapy
	Ecotherapy

2. Nature-based art therapy

Nature-based art therapy, a creative approach facilitated by professional art therapists that supports well-being using natural elements and environments, emerges from the integration of art therapy with nature-based interventions, such as ecopsychology, ecotherapy, forest bathing/forest therapy, and outdoor therapy (25). Since 2020, this therapeutic technique has been increasingly applied across a range of well-being contexts with children, adolescents, and adults, addressing trauma, grief, stress, anxiety, depression, attention difficulties, and transitions through significant life events (25, 40). Themes of re-establishing or strengthening the connection with nature are particularly prominent. Indeed, in a 2024 perspective piece, Stevens examined these techniques through the concepts of "sensing nature's pulse" and "relearning to read the book of nature." Nature-based art therapy engages interaction with nature in two main ways (25). These methods are presented in Table 2.

Table 2. Nature-based art therapy methods.

Direct	Indirect
Creating art with natural materials, building ecosystems/terrariums, nature photography, outdoor mindfulness exercises, planting and caring for plants, producing nature-derived materials	Nature-themed poetry, metaphors, color palettes, ecological identity maps, expressing nature experiences through art

Creating art with natural materials, building ecosystems/terrariums, nature photography, outdoor mindfulness exercises, planting and caring for plants, and producing nature-derived materials. Nature-themed poetry, metaphors, color palettes, ecological identity maps, and expressing nature experiences through art (25).

A 2025 systematic review found that nature-based art therapy enhances emotional expression and recognition skills, fosters group support and a sense of community, promotes the development of ecological identity, strengthens feelings of responsibility and belonging, and increases environmental awareness (25). In a special issue on nature-based art therapies published in 2025, nature was described as a co-therapist. This issue highlighted that nature-based art therapy approaches make treatment more accessible and sustainable (41). As an approach that is ideal for both human and planetary health, nature-based art therapy is also considered to enhance ecological consciousness. For this reason, nature-based art therapy is expected to have a positive impact on psychoterratic syndrome and solastalgia arising from climate change. Interventions that strengthen social determinants, such as community resilience, have been shown to reduce solastalgia, even indirectly (42). In addition, in the reduction of negative eco-emotions—such as eco-anxiety—within psychoterratic syndromes, the processes of recognizing and expressing emotions, particularly when carried out in a group setting rather than in isolation, have demonstrated significant improvement (43, 44).

3. The miniature personal space that brings nature and humans together: The terrarium

A terrarium is a miniature garden placed inside a transparent container and containing various plants, soil, and decorative elements. As an independent ecosystem, a plant terrarium goes beyond being merely a decorative object. Terrariums can be created as either open or closed systems. In an open system, the container serves as a pot that provides a base for the plant species within it. The terrarium is completely open at the top and continues to grow with air, sunlight, and water from the external environment (Fig. 1a). In closed terrariums, however, the cycles of water, air, and nutrients occur internally, functioning like a small ecosystem. In such systems, life continues without external intervention, much like in nature itself (Fig. 1b).

Figure 1. (a) Open system terrarium, **(b)** Closed system terrarium.

This article will primarily focus on closed-system terrariums, as their resemblance to natural ecosystems is greater. In the process of creating a closed terrarium, materials gathered entirely from nature are sufficient. In a sense, they render representations of nature tangible. A terrarium can be integrated into a container as small as the palm of a hand or as large as a room-sized aquarium. In the first stage, soil and stones are placed at the bottom of the container. Their arrangement involves both randomness and human control. Instead of soil, more adhesive materials such as clay can be used, allowing every surface of the container to be utilized efficiently (Fig. 1b). While the design of the ecosystem

is entirely dependent on the creator's imagination, certain biological requirements must be met for a sustainable ecosystem, and the creator should arrange the work with this in mind. Any plant that can grow in a humid environment, particularly moss, can be included in the terrarium. Once adequately sterilized, which can even be done using a household oven, any type of object can be incorporated into the terrarium design. This offers individuals an unlimited and playful space while creating a likeness of nature. Creating a personal, imaginative space from small objects, art materials, and miniatures is a known type of intervention in art therapy and drama therapy.

The personal space created within the terrarium is likewise imaginative, yet it is inspired by nature and can allow a person to symbolically reconstruct the environment they have lost due to processes such as climate change. As previously discussed, the grieving process for a lost environment has been described as solastalgia (18). Through the terrarium, individuals can symbolically reconnect with their lost environment and mourn it.

When creating a terrarium, individuals can incorporate themselves into the work through small figurines, which can further strengthen the nature theme. In terrarium workshops, nowadays often regarded as an artistic skill or pastime—people may take photographs of landscapes they admire during a nature walk and then recreate them in three dimensions through the terrarium. Independent of its appearance in nature or in the photograph, the terrarium becomes a new and unique work that also reflects the individual's subconscious processes.

In closed systems, over time, individuals may observe the plants in the terrarium taking root and growing, new species developing, and animals becoming part of the cycle. Additionally, opening the terrarium lid can release a scent reminiscent of the smell of soil after rain in a forest. Choosing a container made entirely of glass or acrylic ensures sufficient sunlight penetration and allows the internal system to be observed from all angles. This sensory engagement enables individuals to experience the newly created and emotionally significant ecosystem through multiple senses. The ability to observe work from the outside also establishes a therapeutic distance between the creation and its creator. Such therapeutic distance helps individuals engage with their emotions without becoming overwhelmed, facilitating emotional regulation (45). At the same time, this distance is essential for creating a safe space (45). In this way, terrariums provide an opportunity to re-regulate in contact with nature within a safe environment, especially in situations of intense anxiety, such as eco-anxiety.

If the new ecosystem sustains itself, individuals must observe the terrarium and intervene when problems arise, which fosters a sense of responsibility toward creation. This sense of responsibility can serve as a valuable reminder of one's responsibilities toward nature. On the other hand, interventions made during the terrarium-making process without considering biological balance can also harm the ecosystem. At this point, people can come to understand—through the terrarium—that in the human-nature relationship, they are not passive, but both influencers and influenced.

It has been noted that in response to the effects of climate change, individuals may experience excessively heightened anxiety, leading to a form of inaction known as eco-paralysis (46). The ability to create an alternative to an ecosystem exhausted by climate change may help break this inactivity, fostering the development of ecological hope. Ecological hope has been defined as the movement and motivation to pursue a more hopeful future in the face of social and ecological harm (47).

Workshop plan using the closed-system plant terrarium technique for the healing of solastalgia and psychoterratic syndrome

Introduction (10 minutes): The therapist, co-therapist, and participants introduce themselves. The purpose, framework, group rules, and mutual responsibilities of the workshop are explained.

At the start of the creative process, participants are given brief information about closed-system terrariums, and the materials are introduced. The participants underwent a 30-min forest walk as part of forest therapy. During the first 15 min of this walk, participants are asked to collect natural materials found in nature (e.g., pieces of wood, moss, leaves, stones, and soil). In the final 15 min, everyone is asked to photograph a landscape they like.

Upon returning to the workshop space, the collected materials are placed in a shared area, and each participant is asked to choose a container. Participants are shown how to arrange the materials in the container and how to use tools, such as tweezers. Each participant then creates their own terrarium over a 30-minute period. During this time, the therapist and co-therapist may assist participants, especially in situations requiring fine motor skills.

Once the work is completed, the sharing and reflection phase begins. Initially, participants are given space to speak freely about their creations through free association. Sharing can then be deepened with questions such as: "What emotions emerged while making the terrarium?", "What does this small ecosystem remind you of?", and "How might this work serve as a symbol of your relationship with nature?".

To emphasize social consciousness, the therapist can connect participants' contributions within the group dynamic and highlight common themes (e.g., hope, grief, responsibility, control, and letting go). At the end of the workshop, the terrariums are collected from the participants and placed in a sunny room. Each participant is asked to label their terrarium with their name. They are encouraged to observe the changes in their terrarium over time and keep a journal of their

feelings about these changes. Therapeutic justifications for the workshop plan are presented in Table 3.

Table 3. Example workshop session: therapeutic rationale.

Therapeutic Rationale	
Therapeutic distance	The participant engages with their emotions from a safe distance by observing the terrarium from the outside.
Emotional containment/holding	The closed system represents a symbolic space in which emotions are safely contained.
Working with solastalgia	The representation of lost nature allows the grief process to be worked through in a creative and secure environment.
Ecological hope	Creating sustainable small ecosystem fosters hope and a sense of responsibility.
Working with eco-paralysis	The process of creation and care breaks through inaction, encouraging an active relationship with nature.

Conclusion

The mental health impacts of climate change are becoming increasingly visible, particularly through concepts such as psychoterratic syndrome and solastalgia. In this context, nature-based art therapies stand out as a holistic approach that can help individuals transform negative eco-emotions, re-establish their connection with nature, and develop ecological awareness, thereby fostering a more engaged and activist stance. The closed-system plant terrarium technique provides a symbolic and tangible representation of nature, offering individuals a safe space for expression while supporting themes such as grief, hope, responsibility, and acting.

Although there is high-level evidence in the literature for nature-based therapeutic interventions, studies examining the role of nature-based art therapy—particularly innovative techniques such as plant terrariums—on the psychological effects of climate change remain limited. Therefore, future qualitative, quantitative, and mixed-method research involving diverse samples is essential to evaluate the therapeutic impacts of this technique.

As a low-cost, feasible, and sustainable intervention, the closed-system plant terrarium holds potential for inclusion in both individual and group-based psychosocial support programs. Approaches that rebuild the bridge between humans and nature have the potential not only to enhance individual well-being but also to strengthen ecological awareness and community resilience.

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