

RESEARCH THEME

XL cycle – a.y. 2024/2025

Title of the doctoral research From Invaders to Inspirers: Exploring Invasive Alien Plants as a Model for Biomimetic Design and Sustainable Materials Development

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Abstract

Invasive alien plants are one of the greatest environmental challenges of our time. Intentionally or accidentally introduced into new environments through agriculture, horticulture, global trade and travel, these species can become invasive, altering ecosystems, damaging biodiversity and economies, and threatening human health. Despite the common perception of invasive plants as solely harmful, this study proposes a re-evaluation of their role, considering them not only as a threat, but also as a source of inspiration for biomimetic design and the development of sustainable materials. The resilience and adaptability that allow these plants to thrive in hostile environments is at the heart of this research. Indeed, these organisms provide a fascinating biological model for resilient and sustainable design. This study aims to challenge and change perceptions of these plants from environmental problems to valuable resources for design innovation, illustrating how adversity drives innovation. This study will be inherently interdisciplinary, drawing on knowledge from botany, design, materials engineering, professional practices and beyond to explore how invasive alien plants can serve as muses for sustainable innovation in design. Through this lens, we aim to transform the challenges posed by invasive plants into opportunities for the future of biomimetic design and sustainable materials development. In summary, this PhD proposal not only addresses an important environmental issue, but also seeks to rewrite the narrative around invasive alien plants. From species seen as invaders to sources of inspiration, our research could open up new avenues for resilient and sustainable design inspired by nature's most adaptable and tenacious organisms. Emphasising the potential for ecological adversity to foster groundbreaking advances in design, we envision a future where invasive species contribute positively to sustainable innovation.

Keywords

Regenerative Design, Multispecies Design, Plants-Based, Materials for Transition