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## Mycelial education to cure fungal awareness disparity syndrome

Alexander Waller

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## EDITORIAL



# Mycelial education to cure fungal awareness disparity syndrome

The term ‘plant blindness’ or Plant Awareness Disparity (PAD) refers to the fact that many people fail to notice plants in their surroundings. It has been described as being the ‘inability to see or notice plants in one’s everyday life . . .’ and ‘. . . failing to recognize the role of plants on earth and believing that plants are somehow inferior to animals’ (Wanderersee and Schussler 1999). Significantly, ‘. . . plant blindness should not be examined lightly as just a differentiation in preference regarding plants and animals. Ignoring flora can be an opposing factor to environmental balance and directly hinder the achievement of the vast majority of Sustainable Development Goals (SDGs)’ (Amprazis and Papadopoulou 2020).

Like plants, fungi have many functions that enable ecosystems and the biosphere as a whole to thrive. Ecosystems in turn provide essential functions that are virtually impossible to put an ultimate price tag on, including supporting, provisioning, regulating and cultural services. Indeed fungi have been inextricably linked to many of the SDGs (Thomas, Ougham, and Sanders 2021). In addition to PAD, I propose that Fungal Awareness Disparity Syndrome (FADS) is also likely to have a very negative effect on long term conservation goals. Indeed, aside from their instrumental value, fungi possess, as do all living organisms, intrinsic value in their own right.

## Extending PAD to FAD

Drawing on the definition of PADS, FADS could be described as a state where individuals are unaware of the fungi around them and the impact that fungi have on their lives. By extending the disparity concept to fungi, FADS could be described in terms of people showing:

- a lack of interest in fungi associated with food and beverage, decay, disease or nature
- an inability to notice fungi and/or the effects of fungal activity around them
- a very limited knowledge of basic fungal diversity, biology and ecological roles
- a low awareness of the value of and potential benefits from fungi
- a limited engagement in, or vision for, fungal conservation

The final point is of particular concern as although there are an estimated 2.5 million species of fungi, only 0.4% of described species have been assessed for the IUCN Red List compared to 18% of known plant, and 80% of vertebrate, species (Niskanen et al. 2023).

## Factors contributing to FADS

Some data suggests there are fundamental differences in how our visual system processes plants, and that this may contribute to plant blindness. In fact, the majority of fungal tissue is usually out of sight, either being underground or microscopic. However, if the ultimate cause of FADS is not due to sensory limitations but rather to limits to something akin to Gardner’s (1999) Naturalistic Intelligence (NI), where intelligence is the ‘ability to solve problems, or create products, that are valued within one or more cultural settings’ then FADS can potentially be overcome. Higher NI is more than merely naming and sorting, but is a talent of seeing relationships between entities and envisioning solutions to problems in the environment. If NI can be increased then FADS is not incurable.

## A proposed treatment for FADS

The Fungi Foundation in Chile has been instrumental in ensuring that fungi are protected by law, and at least 45 species are included within their country's Species Assessment Process. They have also developed some quality educational materials (<https://www.ffungi.org>). A spiral Mycelial Education (ME) curriculum for curing FADS should be developed, where fungal topics are revisited and expanded upon each year. One recommendation is for a six stranded curriculum. This would begin by introducing knowledge, and progress through comprehension, application, analysis, synthesis through to evaluation. The strands listed below are designed to address and develop skills to raise NI:

- (1) Classification and taxonomy: learning names, groups and types of fungi around us
- (2) Functionality: exploring the diversity of roles that fungi fulfil within nature around us
- (3) Anatomy: relating fungal anatomy to lifecycles and functions
- (4) Interdependence: recognising the interconnectivity of fungi within ecosystems
- (5) Anthropogenic influence: evaluating how human activity impacts fungal vitality in nature
- (6) Looking forward: conservation action and research for novel fungal products

It has been said that: 'Fundamental and applied science on fungi offers solutions for the shift from our current petroleum-based economy into a bio-based circular economy, opens new avenues for food security as demands increase from a growing population, and provides us with new concepts on how to ensure human, animal and plant health' (Meyer et al. 2020). On this basis, interested readers may like to contribute towards developing ME to address FADS.

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Alexander Waller  
American University of Sovereign Nations, USA  
 [arwaller1@hotmail.com](mailto:arwaller1@hotmail.com)