

**BRIEF REPORT**

# Plant awareness disparity: A case for renaming plant blindness

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**Societal Impact Statement**

“Plant blindness” is the cause of several problems that have plagued botany outreach and education for over a hundred years. The general public largely does not notice plants in their environment and therefore do not appreciate how important they are to the biosphere and society. Recently, concerns have been raised that the term “plant blindness” is problematic due to the fact that it is a disability metaphor and equates a disability with a negative trait. In this Brief Report, I place the term “plant blindness” into historical context through a short literature review on the subject and follow this with why the term has been criticized for its ableism. I then propose a more appropriate term to replace plant blindness: plant awareness disparity (PAD) and explain why it both addresses the problems with “plant blindness” while keeping the original reasoning behind the term intact.

**KEYWORDS**

botany education, botany outreach, plant blindness, plant conservation, plants and society, plants and well-being, plants versus animals

## 1 | INTRODUCTION

For over a hundred years, botanists and educators alike have lamented the disparities in attention toward plants and animals. Different terms have been given to this phenomenon over the years, but reports of the issue have occurred since 1919 when general biology courses were first being developed (Nichols, 1919). Throughout the development of these courses, professors noticed that the words “biology” and “zoology” seemed to be synonymous, giving disciplines such as botany a more minor role in these curricula (Nichols, 1919). The term “plant blindness” was introduced in 1999 and is defined as “the inability to see or notice the plants in one’s own environment—leading to: (a) the inability to recognize the importance of plants in the biosphere, and in human affairs; (b) the inability to appreciate the aesthetic and unique biological features of the life forms belonging to the Plant Kingdom; and (c) the misguided, anthropocentric ranking of plants as inferior to animals, leading to

the erroneous conclusion that they are unworthy of human consideration” (Wandersee & Schussler, 1999, 2001).

The term was rooted in both botany education research and literature on visual attention (e.g., Norretranders, 1998) and originally took the place of another term called zoochauvinism (Bozniak, 1994; Hershey, 1993). Zoochauvinism (also referred to as zoocentrism) is now mostly recognized as a distinct consequence or extension of “plant blindness” (Pany et al., 2019). Some examples of it include prejudice against plants and teaching botany among biology teachers (Hershey, 1993), lack of representation of plants in the media, and even neglecting plant content in biology textbooks (Hershey, 2002). For example, teachers and textbooks often use animal examples of universal biological concepts such as evolution, as many instructors prefer to use more familiar animal-based examples (Schussler, Link-Pérez, Weber, & Dollo, 2010). It is worth noting, however, that “plant blindness” as a phenomenon differs across cultures. Most of the research cited here has been done in Euro-centric cultures (such as in

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the U.S. or U.K.). Indigenous peoples tend to have much more appreciation for plants, as evidenced in the book, “Braiding Sweetgrass,” by Robin Wall Kimmerer.

Recently, the term “plant blindness” has been criticized for its history of being a disability metaphor (which is considered ableist; MacKenzie et al., 2019; Sanders, 2019). The term originated as a visual metaphor for the bias that students portray when they fail to notice plants in their environment (Wandersee & Schussler, 2001). However, this visual metaphor equates a disability (blindness) with a negative or undesirable trait (being unaware of and apathetic toward plants) and is therefore ableist (MacKenzie et al., 2019). Unfortunately, the term is difficult to replace, as it encompasses several phenomena that can be grouped into four categories: **attention**, **attitude**, **knowledge**, and **relative interest** (E. Schussler, personal communication, May 13, 2019). However, I believe a change in terminology can and should be made, in order to make it more accessible and remove the ableism attached to the term “plant blindness.” Given that a change from “zoochauvinism” to “plant blindness” has been made before, I am inclined to believe another change in terminology can be made and that many plant scientists will welcome it as it will make the field more equitable and accessible to disabled scientists. As such, I would like to situate the term “plant blindness” in the literature in terms of the four categories and then propose the term plant awareness disparity (PAD) with a justification for why I chose PAD and how it addresses the ableism critique that “plant blindness” has faced.

## 2 | ATTENTION

Most people do not pay attention to plants in their everyday lives. Balas and Momsen (2014) documented that visual attention differences are a cognitive feature by confirming attentional blink in university students—where attention is captured more strongly and for a longer period of time by animals than by plants. Students were also better able to detect animals than plants when shown images of each in rapid succession. Similarly, Schussler and Olzak (2008) noted that university students recalled more animal names than plant ones, even when they were equally nameable. There is even evidence that students do not perceive plants as being alive due, in part, to plants' lack of immediately observable motion (Yorek, Şahin, & Aydın, 2009).

People who are “plant blind” fail to attend to plants as individual biological units, but rather group them together into a large green backdrop. One explanation for this phenomenon is that humans pay the most attention to items that are within 15 degrees above or below the midline of their vision (Wandersee & Schussler, 2001), leaving out objects low to the ground (grasses and herbs) or high above our heads (trees). Another explanation is that our brain searches for visual cues to distinguish individual objects, and a mass of green plants are not as distinct as the shape of a moving animal (Feldman, 2003). This evidence collectively points to how important attention is to the idea of “plant blindness,” but this differential attention has cascading impacts on attitude, knowledge, and relative interest in plants versus animals.

## 3 | ATTITUDE

Attitude is one of the more prominently observed disparities in formal education environments, with students at all levels expressing disinterest in talking and learning about plants. Many readers of this journal will likely recall a time in their educational training when a student has indicated they should not have to learn about plants because of their career interests, future plans, or even the idea that plants do not matter to humans. Wandersee (1986) demonstrated these differentials in middle school students and noted that students preferred to study animals more than plants. A proposed way to alleviate “plant blindness” and its associated negative attitude toward plants in K-12 students is through an outdoor education program, where students have hands-on opportunities to interact with the plants (Fančovičová & Prokop, 2011). Strgar (2007) suggested that teacher involvement including specialist knowledge, enthusiasm, and interest of the instructor greatly influences student interest in and attitude toward plants.

Notably, Balding and Williams (2016) suggested that intentionally anthropomorphizing and empathizing with plants can lead to more interest in plants, less “plant blindness,” and even more support for plant conservation. There is evidence that visual attention can trigger and engage emotion (Mrkva, Westfall, & Van Boven, 2019) suggesting that attention and attitude are related. In fact, Lindemann-Matthies (2005) demonstrated that an educational intervention that drew student attention to plants also increased their interest in the plant. Interestingly, not much research has been done on how to change students' affect toward plants (despite the affective component being so notable in the classroom environment). However, there is a case to be made that if we can get students to attend to plants, they will become more interested in them, which may lead to more learning about plants.

## 4 | KNOWLEDGE

The knowledge component of “plant blindness” is not meant to include all types of knowledge of plants, but rather a more specific knowledge about, and appreciation for why, plants are important to the biosphere and human affairs. Wandersee, Clary, and Guzman (2006) probed community college students' botanical sense of place (an affective and intellectual state of remembering past experiences with plants) to help them understand how plants are important to not only the students, but also humans in general. Frisch, Unwin, and Saunders (2010) used this approach to help educate science teachers about why teaching plants in elementary school is important as well, an effort that is vital given that teachers often avoid teaching plants (and therefore their students lack plant knowledge; Hershey, 1993).

However, the vast majority of literature on the subject of “plant blindness” as it relates to plant knowledge is about testing interventions to look for an effect that is defined and specified by the author (e.g., Fančovičová & Prokop, 2011; Frisch et al., 2010; Strgar, 2007; Wandersee et al., 2006). Nevertheless, specific knowledge about

plants certainly plays a role in “plant blindness” (and vice versa), which is why so many educational interventions have been proposed to address “plant blindness” in both formal and informal learning environments.

Alternatively, some authors have chosen to take a more generalist approach and suggest solutions in a wider variety of contexts. For example, Hoekstra (2000) noted that in order to help combat “plant blindness,” botanists need to partner with the media and enhance their abilities to provide plant information in a relatable and entertaining way. Wandersee and Schussler took an activist approach in their 1999 paper, in which they announced that they were launching a campaign to “prevent plant blindness,” which was followed up with special posters to hang in classrooms.

## 5 | RELATIVE INTEREST

The relative interest component of “plant blindness” refers to the idea that people tend to find other organisms (namely animals) more interesting than plants. This behavior is what was noted a century ago in the first paper to ever document what is now called “plant blindness,” when the author noted that the then-new general biology courses were, “responsible for the popular delusion that biology is the study of animals: that the words *biology* and *zoology* are synonymous” (Nichols, 1919). Lindemann-Matthies (2005) documented this relative interest differential in students in Switzerland. Wandersee (1986) stated that motivation and interest are as much an effect of learning as a cause, and as such, interest may be a component of “plant blindness” that stands in the way of students' learning about botany.

To counteract this relative lack of interest in plants, Strgar (2007) suggested that teachers need to take a more active role in terms of their knowledge, enthusiasm, and interest toward plants. Pany (2014) found that students tend to be more interested in certain plants such as stimulant herbal drugs and medicinal plants, which could therefore be used to teach botanical concepts in order to capture and hold student attention (Pany et al., 2019). Unfortunately, like the attitudinal component, this component of “plant blindness” has also not been as thoroughly researched as the knowledge and attentional components.

## 6 | PROBLEMS WITH “PLANT BLINDNESS”

“Plant blindness” is a complex and interesting subject, and my research has indicated that the underlying principles are sound (e.g., Balas & Momsen, 2014; Fančovičová & Prokop, 2011; Frisch et al., 2010; Lindemann-Matthies, 2005; Nichols, 1919; Wandersee & Schussler, 1999, 2001). However, it has been identified as a disability metaphor and therefore equates a disability with a negative trait that needs “fixing” (Schalk, 2013; Smith, 2015). Not only is this inappropriate and hurtful to members of the disabled community, but it also contributes to ableism. Ableism refers to the idea that

disability is somehow inherently bad, and when in practice, ableism devalues disabled people (Campbell, 2009). This was never the original authors' intention when creating the term “plant blindness,” but nonetheless it is contributing to the erasure and devaluing of the contributions of disabled scientists.

Living life as a blind person is not a good example of, or metaphor for, the lack of visual attention to plants. Despite the fact that our visual systems do, quite literally, have something to do with “plant blindness,” it is a metaphor that is insensitive to, and exclusive toward, members of the disabled community. As someone who is visually impaired myself, I can attest to how different the experience of living with a visual impairment is compared to that of simply being unaware of something in my environment. It is time the two experiences stopped being compared and given false equivalency.

## 7 | CONCLUSION: PLANT AWARENESS DISPARITY

Thus, I am proposing a new name for “plant blindness”: plant awareness disparity (PAD). I have specifically chosen this term for a few reasons. First, PAD is not a disability metaphor, and as such, removes the ableism associated with the term “plant blindness.” It is my hope that this shift in terminology will make the field more accessible and welcoming to all scientists, including those with disabilities. I also hope this will encourage more disabled scientists to participate in the discourse surrounding this phenomenon.

Second, the term still places the attentional nature of the phenomenon front and center, where it should be. The metaphor of “plant blindness” arose because of the nature of the attentional component, but many mistook it to mean that people do not see plants at all (which is not accurate). PAD emphasizes that plants are not completely unseen, but rather placed in the background in the visual service of noticing other organisms. This is important because it suggests that this awareness disparity can be changed through education, which is not the case with blindness.

Third, the word “disparity” in the term is especially important. I am often asked why plant awareness or plant unawareness are not sufficient to describe what was previously known as “plant blindness.” The reason I opted to include “disparity” is because the root of the issue is that people do not notice plants in their environment as often as they do other organisms (namely animals). I wanted to highlight that there is, in fact, a disparity between how we notice and treat plants and animals in our visual cognition processes. This disparity is then what causes the other components of PAD: when we do not notice plants as often as animals, we tend to be less interested in them, less knowledgeable about them, and we have a less positive attitude toward them. While all of these components are important, the term plant awareness disparity highlights the original source of the problem similarly to how “plant blindness” used to.

The term “plant blindness” has only been around since 1999 when Wandersee and Schussler first coined and described it, but

the phenomenon it refers to has been around since the 1900s (Nichols, 1919). Here I have summarized a short review on the literature pertaining to the subject, and explanation as to why the term itself is problematic, and a justification for my newly proposed term, plant awareness disparity.

The disparity between how often people notice plants compared to how often people notice animals is what causes plants to be placed in the background and animals to be placed in the foreground of our visual field. This disparity is what is responsible for students lacking interest in plants, lacking a positive attitude toward plants, and lacking knowledge of why plants are important. In knowing the exact nature of plant awareness disparity and its numerous outcomes, we can work to suggest educational solutions to these awareness differentials in our society.

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