A Mind Without A Brain: The Science Of Plant Intelligence Takes Root

- The little bit that we have looked suggests that we should look further, we should look deeper.
- The best criticism to any science, experimental science in particular, is experimental science itself.

Do plants have a mind?

“My work is not about metaphors at all,” says Monica Gagliano. “When I talk about learning, I mean learning. When I talk about memory, I mean memory.” Gagliano, an evolutionary ecologist, is talking about plants. She's adopted methods from behavioral experiments used to test animal intelligence and found that plants respond in a similar manner. The results of her research suggest plants might possess intelligence, memory and learning, although the mechanisms at play may be fundamentally different from those of humans and animals. Her book “Thus Spoke the Plant” will be out this fall.

Gagliano’s claims are controversial. She’s received equal amounts of attention and criticism from colleagues and the media. Her work was introduced to the public in an in-depth primer on plant intelligence that came out in The New Yorker in 2013 called, Intelligent Plant. This year, Gagliano and her plant studies were featured on the popular science show, RadioLab. Notably, however, there’s been almost no criticism of the methods or results of her peer-reviewed studies. One critique of her methodology was resolved with a clarification.

Gagliano’s critics instead focus on her use of language. They accuse her of using metaphor to interpret her findings. Yet Gagliano insists she’s not using metaphor. Language is important to Gagliano. She’s a plant scientist making bold claims about plant consciousness and intelligence based on experiments and what she maintains is a clear-cut and literal interpretation of the data. It’s a mistake to lump
her in with plant neurobiologists (a group of physiologists also making claims about plant intelligence) because Gagliano is precise about language and points out: "plants do not have neurons."

If Gagliano’s interpretation of the data is correct, the scientific community may have to reckon with intelligent organisms independent of the traditional brain and nervous system model. If her interpretation of the data is correct, we may be in the early stages of waking up to a world long-populated by considerably more intelligent, sentient beings than previously acknowledged. It would be a major paradigm shift. Critics of plant intelligence emphatically insist this work is a fanciful delusion and that plant behavior is mechanistic, not intelligent. Meanwhile, Gagliano and other plant biologists have sparked a debate about our natural world that mirrors a contentious debate in the tech world: can artificial intelligence ever become, or be recognized as conscious intelligence independent of the traditional model of a biological brain and nervous system?

Since so much of this debate hinges on language, I interviewed Gagliano to talk about the science in her own words:

**Morris:** When did you start to think the behaviors you observed in plants might indicate intelligence?

**Gagliano:** I was a marine scientist first, by training. So I worked a lot with animals first, especially coral reef fishes in the wild as an ecologist. I realized only in hindsight that the same question I had about the animal transferred onto the plant. The main realization for me wasn’t the fact that plants themselves must be something more than we give them credit for, but what if everything around us is much more than we give it credit for, whether it’s animal, plant, bacteria, whatever. So the plants were, I guess, the easiest stepping stone for me as an animal ecologist to translate the same question experimentally. But I’m not necessarily attached to plants in that way. Although, of course plants have taught me a lot and through the process of working with them I have learned a lot about who they are and who I am as well in relation to them, I needed to go through that first phase of interacting with the animal world and realizing that there is much more there than we are allowing them to show. There is more here than we’re actually acknowledging.