Tiny plant, big potential: Researchers raise money from public to sequence 'superorganism' genome

June 12 2014

Azolla can comfortably sit on your fingernail. Credit: Duke University

Scientists from Duke University and Utah State University are raising money through crowdfunding platform Experiment to sequence the genome of a promising little fern called Azolla. Understanding this unique plant could be a huge step towards decreasing Earth's CO2 levels, improving biofuel production, and lowering food prices.

For centuries, Asia's farmers have been growing Azolla together with rice to bolster rice output. That's because Azolla isn't just a plant, it's a 'superorganism,'—it consists of both the fern and a diverse array of symbiotic bacteria. It has the power to capture all the nitrogen fertilizer it needs to grow from the air around it, making it the perfect bio-fertilizer.

But scientists are also taking cues from Azolla's powerful history. Fifty million years ago, the Earth was so warm that the North Pole was almost entirely covered with the floating fern Azolla. As these Azolla plants died and became part of the sediment, they took atmospheric carbon down with them. Global atmospheric levels of CO2 fell significantly.

Though a single Azolla plant could fit on your fingernail, it can double its entire body mass in just less than two days, making it a promising alternative for biofuel production and carbon-capture efforts.

"Azolla and [its microbes] can combat global warming and produce precious nitrogen to help feed the world," said lead researcher Dr. Kathleen Pryer. "Wouldn't it be great to understand this symbiotic relationship better? To be able to decipher the biological 'conversation' between the host and the microbe?"

Through Experiment's platform, Pryer and her team are sharing progress reports in real-time. When backers give money to the project, they receive behind-the-scenes access to research updates, and recognition in the published results.

Azolla in a rice paddy in Philippines. Credit: Duke University

If fully funded, the researchers will draft the first ever sequence of a fern genome. This will provide not only a framework to examine evolutionary patterns in land plants, but also a critical resource for nitrogen fixation, biofuel production and symbiosis research.

The project has 32 days remaining to meet a funding target of $15,000. So far, they have raised $1,700 with the help of 36 backers.

Experiment recently surpassed $800,000 in total research funding raised. The site has been featured in The Economist, Forbes, Nature, and The New York Times.

More information: Project Link: experiment.com/projects/azolla … sive-green-potential