How Did We Get Here? (OR Why all Life on Land Depends on Fungi!)

The Evolution of terrestrial plants and all life dependent on plants may not have been possible without Fungi. There have long been suspicions on how plants went from aquatic environments to terrestrial ones (land) where functional roots and vascular systems, including the ability of a plant to stand upright, were fully developed. Scientist couldn’t figure out how (aquatic) plants survived long enough for this change to happen. In order for a trait to continue to the next generation, the plant has to be able to successfully reproduce. This seemed impossible given the previous assumptions.

The fungi responsible for helping plants get from water to land are classified as Mycorrhizal. More specifically, they are Arbuscular Mycorrhizal Fungi, or AMF. The Mycorrhizal part explains the key component to how this symbiotic relationship works. The Fungi form a relationship in the root system of the plant, exchanging nutrients for carbon. We have known about this fungi for a long time, but studying it has proven difficult because of the nature of its purpose and dependency on the roots of a living plant. The interesting part is that scientist knew about the AMF in terrestrial plants, but didn’t think about looking for them in fossilized aquatic plants. When they did find AMF in aquatic plants, they found a clue to the history of life on planet Earth.

The implications of these findings are vast. The earth’s atmosphere depends on Oxygen, which depends on the land plants that produce that oxygen, which we now know may not have been possible without fungi associated with the roots of these plants. All animal life depends on plants and a breathable atmosphere. The conclusion that we come to is simple: All human life as we know it, along with all other terrestrial life, is owed to the Fungi Kingdom. This underrated lifeform that many of us only think of while figuring out what kind of pizza toppings we want, is responsible for it all! By no means did they do it alone, but they are the missing link that so many biologists have been looking for. Biologists have suspected this fungi to have a role for over 30 years, and now the evidence is in. The reason it took so long is that tracing genomes back to earth before any land plants is no easy task. Can you imagine it? No atmosphere, a bare landscape, and some water. The only life on earth was in that water. Since there was no atmosphere yet, it didn’t rain, there were no clouds just dirt, rock and water. It’s only natural to wonder how this planet developed into what it is now from what it was then. Each step in between being vital for the next, and how many things could and may have gone wrong.

The story of our world is far from over and there are many questions that still are unanswered but this one has opened the door to more inquiry into the underrated and understudied Kingdom known as fungi. Further research will aid in our understanding of life on earth, and how life on other planets may be possible given the right conditions.

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