

Evolution of Plants Essay...With a Tad Bit of Skateboarding

By Nico

This paper is about the evolution of plants. The phylogenetic tree is a diagram that shows evolution. It is a family tree in other words. It shows what species are related and what characters they have in common. You might ask how? Well, by identifying the origin of the plant, which are the charophytes, because they are at the very bottom of the tree. You can see what characters they have in common by the boxes at the bottom of the branches. The characteristics of plants are chloroplasts, cell wall, and photosynthesis. This basically means these are the main traits. The plants need all 3 of these traits to be called a true plant. Chloroplasts are organelle inside plants and causes photosynthesis to occur. It also makes the plant green. They are filled with chlorophyll, this collects sunlight. Cell wall supports and protects the cell. It has a cell membrane. Photosynthesis makes the energy for the plant. CO₂, water, and sunlight go into the plant and produce sugar(energy) and oxygen(a waste product). It also makes sugar and oxygen. The plants are at the bottom of the food web. The food web is a more accurate and complex chart than as the food chain. Plants feed everything...with themselves. Even indirectly. What would happen without them? Well, everything would die without oxygen. The animals would suffocate and without the plants they would starve.

The common name for charophytes is green algae. They are not true plants, meaning they are ancestral. They don't have all the plant characteristics but they have all the ones we are discussing.

Charophytes are the possible ancestors. Ancestral means often less complex, like prokaryote cells compared to Eukaryote cells. An ancestral plant will be old, less complex than the other plants. They live in water, sometimes they float on top, but usually in the water.

Symbiosis means really close to each other which I suppose you could

call mutualism. That is, unless they are lichen. Lichen is algae and fungus combined. The fungus supplies the protecting and the algae supplies the food. Unfortunately for them, there are no tubes to transport water. Now you might just ask, how do they deal with non vascular tissue? Well, by swimming in water because they are surrounded by it. Another fun fact is it also has a lot of surface to volume area and that they are tall and skinny. For example, Ulva is only one cell thick. Moving on to Spirogyra. Spirogyra is a very interesting charophyte. Especially its image. It is a green algae. You might question why it is called lichen. Well, because it is filled with spiral chloroplasts. Man, ever since this project started I've started a lichen towards it. Skateboarding wise, the charophytes of skateboarding is the first board ever made. Basic, no graphic, and a role model to base everything else off of.

Bryophytes are commonly known as moss, liverworts, and hornworts. They live on the land, unlike most charophytes, which live in water. They absolutely need water to reproduce. Which is a pro in there situation because most plants do. They are non vascular. Their shape is short and fat but this helps them with osmosis. Now you might ask about Hyaline Cells. Well, they are dead cells. Thats right, deceased! They work by holding buckets of water when it is dry out. Why can we not call their parts stems, leaves and roots? Well, because they have different functions that are very similar. Such as: The phylid (like a leaf), to make food, a rhizoid (like a root), to hold it in the ground, seta (like a stem) holds up the spore pad for photosynthesis, and a capsule (like a seed pod), that holds spores. They have NO seeds. So instead for reproduction they use spores. Spores differ from seeds because they are smaller, Don't have as much resources for the baby plant. and don't need to be fertilliezed to grow into a plant. Oh skateboarding, it just gets better and better. Bryophytes for skateboarding is the board with griptape finally. A whole new

experiment adding new little aspects of it on at a time.

This paragraph is going to be formed around plants adapting to their environment. The plants main concern is drying out. There are a couple ways to not dry out. Hold water in using the cuticle and the stomata. Cuticle is waxy covering over leaves and seals in water. The stomata allows gas to exchange when open. It reduces evaporative water loss when closed. Then there is moving water. This all falls under the category of vascular tissues. The Xylem conducts water and dissolved minerals. It goes upward from the roots. The Phloem conducts sucrose (food). It goes downward from the leaves. You might wonder how to move water. Well, that is simple...Transpiration. Transpiration is the process of water loss to evaporation at the top of the plant. This equals plant sweat. Plants don't want this, they are selfish and want to hold on to their water. You know, skateboards can adapt to their environment too. Like certain wheels meant for certain terrain. It also absorbs water into itself and becomes a much more heavier skateboard. Interesting how all this can relate to so many different things.

The Pterophytes are commonly known as ferns or horsetails. Mosses and ferns are alike because they are seedless. They live on land, just like most of these plants I have discussed. This one lives mostly in moist areas though. They can handle more dry areas than mosses can. They need to be near damp areas and near water because of their spores. They also need H₂O(water). Sori are the little structures that hold and create the spores. They are located on the underside of the leaves. The seeds are different from the spores because they are smaller, don't have as much resources for babies, and don't need to be fertilized. They have vascular tissue meaning that they can move swiftly in water. The shape changes to change though. It becomes no longer constrained to have maximum SA for osmosis, it can become tall. Sometimes they are called "walking ferns." The skateboarding factor of this refers to the object griptape. Griptape is spiky and sticky and,

well, grippy. The grip almost feels like tiny needles too.

Now these common plants are known as Conifers/Pine trees. They are called Gymnosperms. They live on land and are vascular. This has a massive impact on their shape. An interesting fact on gymnosperms is that their cones can trap the fog making a small delusion as if it was foggy and grey whereas on the other side of the tree it was bright blue sky. Interesting. They can grow really tall and why? Well, because they have amazing vascularity. They move in water all the time and use their xylem for gathering water and phloem for gathering food. The seed-bearing plants that lack the combination of specialized features that characterize the flowering plants. Because of this their seeds are limited. They do not rely on water for reproduction because they can live farther from water. Now skateboards can relate to the gymnosperms because of how new and more complex they are with graphics, stickers, extra places it can travel, how long it lasts, how it can get smaller and taller, the more advanced. This is skateboarding today

Now Angiosperms are identified as Flowering Plants. They all live on land like the gymnosperms. They are vascular as well, and with this being said, their vascular tissue makes it so they can grow very very tall. They can grow tall and do the exact same thing that gymnosperms do to gather water and food. They use the xylem and phloem. They do not rely at all on water for reproduction. They are geared to dry land. They reproduce with their seeds, flowers, and fruits. The seeds are the second to evolve seeds, the flowers are to attract the pollinator and the fruits are to move the baby far away from the mom so they aren't in competition. The goal to attract pollinators is to get much better genetics. The flowers are one of the main causes to attracting pollinators. 1. They are pretty 2. They smell great 3. They have UV 4. They are great with trickery. Because of the pretty color they have they can attract different species. Smelling good for any

living species is important because they can attract species by scent rather than sight. The UV is of mass importance because the bees can see UV. The trickery is tricky because some flowers are meant out to look like wasps or bees and have a small little coat of fur on some. Overall, wasps and bees are very horny. Now onto the skateboarding factor. No, I'm not going to say that the skateboard is horny but it craves a skateboarder to be on it. Meaning, when a skateboarder sees a skateboard, well, there is no turning back. Thanks to skateboarding we are who we are today. Amazing organisms.

Evolution. The process by which different kinds of living organisms are thought to have developed and diversified from earlier forms during the history of the earth. All organisms evolve over time. Evolution occurs to plants because it allows them to become more complex. They change to better fit the environment and evolve to get somewhere new. The scientific word for new places is pronounced "niche." Evolution is a very slow process and takes many small steps. It happens over a very long amount of time and you don't notice it when it takes place. Also, Evolution is happening every second every moment around us. Now, evolution being what it is connects to the term "adapt." For an organism to evolve over time, it also needs to adapt to its changes. When adapting it can go through some harsh changes, and is derived from its habitat, eating habits, general everyday things it needs. The ancestral plants are the most evolved because they were the first plants. Other plants added on from these ancestors and became what their species are today. The ancestors have been around for a long long time and are definitely the most evolved plants. Fascinating. Skateboarding and many different organisms/objects evolve over time becoming more and more complex. Even us humans do. Plants keep it a lot more simpler though and help keep us alive and well. Thank you plants!