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Biology B

### **Biology Plant Essay**

Plants play a vital role in the world's existence, they're hard workers in what many of all of us on this planet need to be able to survive. The evolution of plants has progressed massively overtime with adaption and gaining complexity. The plant evolution was formed by a series of progresses, many taking place inside the plant. A lay out called the Phylogenetic tree shows much of its progress over periods of time.

The phylogenetic tree is a diagram that shows evolutionary relationships between the plant species.. It can be described as being much like a family tree, its branches reaching out, connecting one person to another, in this case it would be connecting one species of plant with another. Its job is to show how closely species are related by the characteristics of plants, and what they have in common with each other and don't.



Characteristics of plants are the traits that all plants have in common with each other. Chloroplast is one of them.

Chloroplasts is an organelle in the cell that is usually green and makes photosynthesis for the plant. In order for the plant to have food and energy, to keep the plant alive and happy.

The process of plants making food and energy is through a process called Photosynthesis. During this process the plant takes in carbon dioxide(CO<sub>2</sub>) and water(H<sub>2</sub>O) and sunlight, the process of photosynthesis changes it into food and energy for the plant to live.

What protects the plant cells is a surrounding wall called the Cell wall, the cell wall surrounds the cell membrane and its job is to support and protect the plant cells from any harm. Unfortunately the cell wall can not the protect them from being eaten by mammals and the mammals feathered friends.

Representing the animal food chain is a diagram called the Food web, it is a more complex and fancy version of the food chain. A food web is much more accurate and provides more information than a standard food chain chart would. On the food web plants are at the bottom. Reason why, obviously, they don't eat animals or other plants. Plants are producers instead of omnivores or carnivores. Plants' jobs are to provide food for everyone. Little animals feed on them, the little animals are then eaten by the bigger animals, and so on. The food web's exact purpose!

Without plants on this earth most species would not be able to exist, including humans. We need oxygen to breath and plants are our only natural providers of oxygen. If there is no air, obviously we wouldn't be able to stay alive, even if we had air to sustain ourselves the animals would not. Then they would starve to death, and then we would starve to death as well. We need plants and trees to be able to live. Without them life would be very difficult to live in.

Sometimes you might ask yourself what is green algae, what is that stuff that you feel against the bottom of your feet when you go swimming in ponds sometimes, what is it? Green algae is a single cell organism that lives in water, also known as charophytes. It has a huge variety of form with many different names. In general it is long and thin, although others can look like trees, circles, and blobs.

Evidence suggest that charophytes( green algae) evolved about 700 million years ago. They are believed to be some of the ancestors of many plants today. How do we know this? Green algae does not have all characteristics that all plants have in common with each other, making them not true plants. Green algae is not a true plant unlike vascular plants like mosses or flowers. True plants have all the characteristics of a plant while charophytes does not because they are the oldest. Everybody but charophytes are true plants.

Green algae lives in the water, in fact, they are the only aquatic plant that can. All others live on land unless they are lichen.

Lichen a sybiosis, a fusion of algae and fungus. The algae provides it with food and protien, while the fungus provides a shelter. It allows algae to live out of the water by living on trees and rocks while living inside the fungus.

Algae is a non-vascular plant so it is not able to move water through little tubes for vessels like some other plants do. Algae absorbs water like a sponge, soaking in all the food and protein it needs.

Spirogyra is a type of green algae. It looks much like a long stick with green squiggles. The green squiggles are filled with chloroplast that allows the cell to have the process of photosynthesis. Spirogyra was named after its spiral looking green bands of chloroplast.

Bryophytes are small flowerless, non-vascular plants that live on land and belong to the division of Bryophyta, including mosses, liverworts, and hornworts. Bryophytes grow in clumps and do not have roots, instead they have root-like growths called rhizoids that help anchor them. Because they don't have roots and stems to carry water, mosses can dry out quickly, and that is why they are most usually found in moist areas near water.

Bryophytes are able to live on land due to a number of characteristics. First, let's make something clear, Bryophytes do not take in water by roots, Bryophytes are like sponges that absorb the water. Their body size is another role in this. Bryophytes are short and fat, this allows them to transport nutrients and food to be stored inside the Hyaline cells. Hyaline cells are dead cells that hold the stored water like buckets. Bryophytes do lack special structures that allow them to carry water long distances. That is why they live in damp areas. Bryophytes tend to be very small. They have leaf-like structures or phyllids that are basically the type of leaves.

Bryophytes rely on water to reproduce. They do not have seeds, instead they have sperm. They need water because when the male plant releases the sperm into the water they need to swim to find the female plant so it can reproduce. That is why Bryophytes depend on water to reproduce.

Over the thousands of centuries on this planet plants have made massive adaptations to their environments. The first plants to ever exist started out living in the water, and then slowly began to make their way onto land by learning how to adapt with different environments. For example, a major adaptation to some land plants is the cuticle, to help reduce water loss, and the vascular system!

A cuticle is a protective layer covering organisms on a plant's leaves. It consists of lipids and hydrocarbon polymers. It has resin that is sticky that helps fend off parasites. Its main job is to use its wax-like surface they have helps hold the water in and keep it from all escaping the plant with the help of the stomata.

Tiny pores in a plant leaf that is surrounded by pairs of guard cells are called Stomata. The job of the stomata is to open and allow CO<sub>2</sub> to enter the leaves of the plant, which will then go into the process of photosynthesis. The stomata serves as the site for gas exchange, CO<sub>2</sub> and H<sub>2</sub>O evaporation through transpiration. However, plants are selfish creatures and do not want to give up the water evaporation which is why they work together with the cuticle who have the wax-like cover on the leaves, made to prevent water loss as much as possible.

Transpiration is the act of transpiring water through the stomata of the plant tissue into the air. In other words, the process of water evaporating into the atmosphere. Transpiration is an important and essential process. It helps keep the plant healthy and therefore contributes to our survival, since photosynthesis must take place in order to supply our oxygen.

Vascular tissues are types of tissues that transport fluids through the plant, evolving when the vascular system formed. Xylem and Phloem are two vascular tissues found in plants. Both serve the plant as transporters for its system. Xylem's responsibility is to transport water from the roots to all parts of the plant. Phloem is responsible for transportation for all the food and other nutrients that the plant needs. Xylem transports water and minerals while phloem transports water and food.

Plants have evolved over time and gained many complexions and differences from what they once came from. The adaptations have taken thousands of years but they have been able to move from water to land with the adaptations of the vascular system and leaves with waxy covering and many other advancements.

Also in the early stages of plant evolution we have Pterophytes. Pterophytes also known as ferns and horsetail are seedless plants like mosses. One thing both have in common is that they both have spores and are land plants that live in moist areas.

Pterophytes live on land, and were the second plant to make it on land. They live in moist areas. They can handle drier areas than mosses can because they don't rely on

osmosis. They have to live in moist areas because of their spores. Pterophytes need water in order to reproduce because the sperm swim from the male to the female plant.

Pterophytes also have the vacular system, meaning they can move water. Since they no longer are required to constrain water for osmosis they don't need to be fat or skinny or long or short. They can be tall because they can move water, and the taller they are the better the process of osmosis.