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Prelab #4 SLS44-09/Period 4,5

1. Green plants or algae are considered to be the ancestors of land plants because they appeared before life took a foothold on land. Algae are single cellular protists that evolved to be autotrophic by creating food using the energy of the sun. As life advanced, it became more and more complex. Protists eventually evolved into multi-cellular organisms that could support themselves on land. In terms of modern time, charophytes (a group of fresh water green algae such as stoneworts), are closely related to land plants because they have a phragmoplast type of cell division, meaning when they divide, there is persistent telophase spindle and a cleavage furrow with microtubules perpendicular to the plane of cell division.

2. The two adaptations that were necessary for these photosynthetic algae to make the transition from aquatic to terrestrial habitats was dealing with reproduction without the presence of water. When water was present, algae would just eject their embryos into the water. This is not viable on land, therefore terrestrial plants must develop embryos within themselves. The next problem was that terrestrial plants must find a way to prevent drying out while still allowing for gas to be exchanged. The solution for this was a waxy cuticle to limit evaporation and stomata that can open and close depending on the situation to allow for gases to be exchanged.

3.

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|  | Life Cycle | Habitat | Reproductive Method | Method of Digestion | Taxonomic Classification (Kingdom, Phylum, and Class) |
| *Spirogyra* | These algae will arise from spores at the bottom of lakes. They get food from photosynthesis. Once the time is near to reproduce, they will find a partner. | Relatively clean nutrient rich water. | Sexual reproduction by connecting to each other with tubes and dumping some contents of the cell into a zygospore. This algae can also reproduce asexually. | These are algae that are autotrophic. They do not digest food. | Kingdom: Plantae Phylum: Charophyta Class: Zygnematophyceae |
| *Volvox* | This algae begins as a zygote. As the algae grows, it will eventually form colonies. These colonies will grow and spawn more colonies. | Clean nutrient rich water. | In asexual reproduction, *Volvox* form colonies called gonads. Cells grow from the equator of the colony, which eventually flips inside out.  In sexual reproduction, male and female colonies will form germ cells. Male colonies will form sperm cells while female colonies will enlarge to form an ova. | These are autotrophic organisms. They do not have to digest food. | Kingdom: Plantae Phylum: Charophyta Class: Chlorophyceae |
| *Rizopus* | This fungi starts out life as a spore, generally floating in the air. Upon landing on something that it can consume, it will grow. After enough growth, *Rizopus* will start to reproduce and eventually die. | Decaying or live plant or animal matter. | It can reproduce sexually by having a zygospore form from touching together tips and combining positive and negative nuclei. It can also reproduce asexually by reproducing within the spore capsule. | They grow into food as they take in nutrients via absorption. Enzymes may also be secreted to help dissolve the food. | Kingdom: Fungi Phylum: Zygomycota Class: Mucormycotina |
| *Agaricus* | A young mushroom will mature. The adult mushroom will release cells that eventually fall towards the ground. They grow into the ground to find a mate, and spread out. Then, a young mushroom will pop out once again. | Depending on the species, this may vary from already broken down biological matter to wood. | These mushrooms reproduce sexually. Each basidium holds halpoid products of meiosis. As these products fall to the ground, they must find a mate to form a mushroom. | This mushroom is usually a secondary composer that decomposes the products of bacteria and other fungi. Enzymes may need to be secreted. | Kingdom: Fungi Phylum: Agaricomycotina Class: Agaricomycetes |

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