Line 1 – Plant biodiversity, Evolution and systematics

Exploring diversity of photosynthesis regulation

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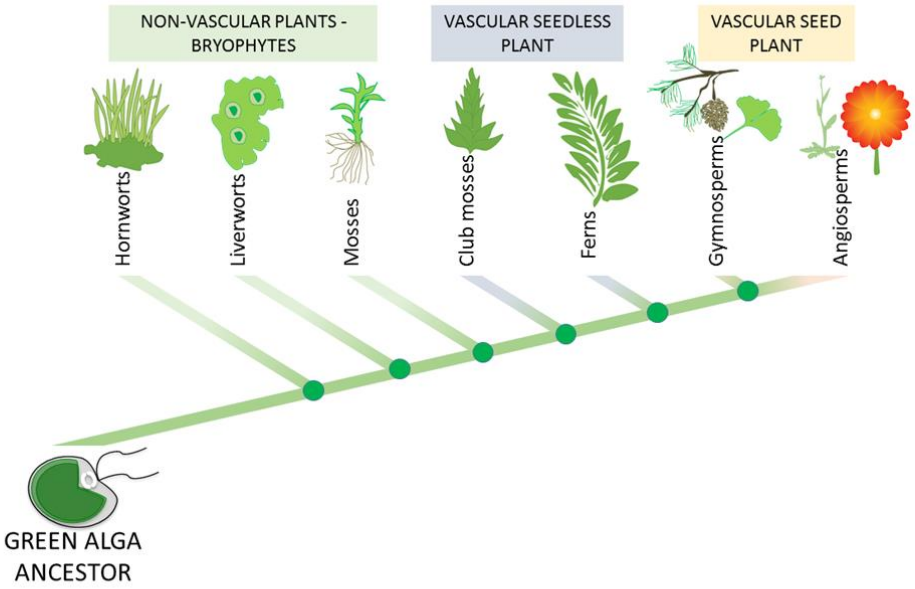
Project description

Photosynthesis is a fundamental reaction sustaining life on Earth. Photosynthetic organisms use sunlight energy and carbon dioxide to produce the biomass that directly or indirectly feeds all heterotrophic organisms. Photosynthesis also plays a major influence on geochemical carbon cycle by consuming carbon dioxide (CO_2) and producing molecular oxygen (O_2).

Regulation of photosynthetic reactions changed during evolution, adapting to the colonization of different environments and their variable physico-chemical conditions. Investigation of plants diversity and adaptation through space and time is thus an extremely valuable tool to investigate how these mechanisms changed during evolution. To this aim we are studying the photosynthetic responses of a large set of plants available at the Botanical Garden of Padova which diverged at different times during evolution (clubmosses, ferns, gymnosperms and angiosperms). We are also analyzing in details the molecular mechanisms for photosynthesis regulation in the moss *Physcomitrella patens*, an extant model bryophyte for the study of water-to-land transition in plants.

- Figure



Simplified tree of Land plant evolution