

## **The impact of plant physiology on environment and ecology before and after flowering plant evolution**

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Ecology must necessarily be the foundation of our understanding of paleoecology and—since extant terrestrial vegetation is overwhelmingly dominated by flowering plants—plant ecology is largely angiosperm ecology. However, the biology of flowering plants is in many ways unique. That presents a problem when considering the earlier evolution of terrestrial ecosystems and the 300 million year fossil history of a vascular plant flora prior to the angiosperm radiation. While covering the physiological differences of angiosperms and their environmental impacts, I'll focus on evidence for low terrestrial productivity in the pre-angiosperm fossil record and evaluate how this revises basic expectations regarding the early evolution of vascular plant ecology. Productivity has often been treated primarily as the result of and a feedback to atmospheric CO<sub>2</sub> concentrations, however productivity was likely to have been consistently much lower prior to angiosperm evolution regardless of CO<sub>2</sub> fluctuations.