

A completely normal title about scientific research, not stolen from another conference

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The oxygen in the present-day atmosphere was produced by cyanobacteria and similar organisms 2.5-3.5 billion years ago. Early photosynthetic organisms evolved in an atmosphere rich in CO₂ and poor in O₂. We are currently investigating the tolerance of several cyanobacterial species to very high (>20%) concentrations of atmospheric CO₂. Cultures of *Synechococcus*, *Synechocystis*, *Plectonema boryanum* and *Anabaena* were grown in liquid culture and bubbled with CO₂-enriched air. Culture growth was monitored by measuring optical density at 750 nm. Damage to photosystems I and II was monitored by redox-dependent differential absorbance ($\Delta A_{830\text{ nm}}$) and variable fluorescence (F_v/F_m), respectively. *Synechococcus*, *Plectonema*, and *Anabaena* tolerated CO₂ concentrations up to 100% when the CO₂ content was gradually increased from ambient by 10-15% per day. However, *Synechocystis* did not tolerate high CO₂. Strains that were sensitive to high CO₂ were also sensitive to low initial pH (pH 5-6), indicating that the formation of carbonic acid was partially responsible for the inhibited growth in high CO₂ environments. Cyanobacteria that were sensitive to high CO₂ environments (e.g., *Synechocystis*) exhibited rapid inhibition of photosystem II as indicated by decreased F_v/F_m . The results of photosystem I experiments (in progress) will also be presented.