Spirulina: Growth and response to salinity [MAS]

Kelly Burney and Stanley M. Wiatr
Dept. of Biology, Eastern Montana College, Billings

The influence of limited nutrients and salinity on growth characteristics and productivity of the cyanobacterium *Spirulina* were evaluated in laboratory cultures. All trials began with a homogenized suspension of 50mg *Spirulina* added to 150ml Provasoli's nutrient medium with NaCl (0 - 800mM) in 250ml Erlenmeyer flasks. Cultures were grown at 30-31C under continuous light (PAR 70-85 Wm^{-2}) and constant aeration, typically over a period of 7 days. Flat, membranous colonies were observed at low salinity, while flocculent tufts or strands and floating amorphous masses of filaments were more prominent at higher salinity. With continuous nutrient supplementation, a linear increase in fresh weight was observed with increasing NaCl (0-500mM). Dry weight increased to a maximum at 300-400mM NaCl, then declined with higher salinity. In *Spirulina* cultures under a single dose of nutrients, both fresh and dry weight increased in medium up to 100mM NaCl, with a gradual decline between 200-600mM NaCl, and a precipitous reduction in yield above 600mM NaCl. These observations indicate a facultative adaptability of *Spirulina* to salinity, which may be related to the nutrient environment. A broad spectrum of continuously available nutrients favors growth in a saline environment (up to 500mM NaCl), while an environment with limited nutrients favors growth under markedly lower salinity (optimum of 100mM NaCl). Interaction of specific nutrients and their effect on growth of *Spirulina* in a saline environment remains to be investigated.