

PHOTOSYNTHETIC CHARACTERISTICS OF *MYRIOPHYLLUM SPICATUM* AND SIX SUBMERSED AQUATIC MACROPHYTE SPECIES NATIVE TO LAKE GEORGE, NEW YORK

Authors: J.D. MADSEN, C.F. HARTLEB, AND C.W. BOYLEN

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Abstract:

1. The macrophyte community of Lake George, New York is diverse, composing of forty-eight submersed species representing a wide range of habitats, depth ranges and life-history strategies. The photosynthetic rates of seven representative submersed aquatic macrophytes were determined in laboratory studies using measurements of short-term changes in oxygen concentration at eight light intensities from 0 to 1000 $\mu\text{mol m}^{-2} \text{s}^{-1}$ at 20°C. The species examined were: *Elodea canadensis*, *Myriophyllum spicatum*, *Potamogeton amplifolius*, *P. gramineus*, *P. praelongus*, *P. robbinsii*, and *Vallisneria americana*.
2. Comparisons of maximum net photosynthesis, Michaelis–Menten V_{max} and K_m for photosynthesis versus irradiance, and dark respiration rates correlated with changes in community composition and species distribution with depth.
3. In particular, *Myriophyllum spicatum* exhibited a high photosynthetic rate (V_{max}) and high light requirement (both in compensation point and higher half-saturation constant (K_m) indicative of a high light-adapted species. In contrast, the native species exhibited shade-tolerant characteristics.
4. Simple daily carbon balance models indicate that *M. spicatum* has a higher positive carbon balance near the surface than the native species, but carbon balance decreased more rapidly with decreased light. All species showed greatly reduced carbon balances under a simulated *M. spicatum* canopy, indicating that native species might not survive. *Myriopyllum spicatum* leaves would experience self-shading and eventual sloughing.

Full article can be found at: <http://dx.doi.org/10.1111/j.1365-2427.1991.tb01732.x>