

Strategic Analysis and Phytoplankton Ecology

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Experiments were begun to test the hypothesis that algae from eutrophic lakes produce substances which make zooplankton avoid the algae, while algae from oligotrophic lakes do not produce such substances. The experiments were conducted in a 15x5x4 cm (LxWxH) plexiglass box with a movable vertical partition in the center. Six Daphnia pulex were placed on each side of the box with the partition completely to the bottom. After 10 minutes 1 ml of filtered lake water or fresh culture medium, or 1 ml of algae concentrated from lake water or cultures, was added to the left portion of the box and the partition raised 8 mm from the bottom. After 15 minutes the partition was dropped and the number of Daphnia on each side of the partition recorded. The expected distribution of animals (from experiments adding 1 ml of lake water) was compared to the distribution after treatment (from experiments adding 1 ml of algae) with the Wilcoxon two-sample test.

Results showed that Daphnia avoided Anabaena flos-aquae and Microcystis aeruginosa taken from pure cultures growing in the log phase ($\leq .01$ level), but not algae from senescent cultures. The Daphnia did not avoid filtered culture medium from either log or senescent cultures. Daphnia avoided algae concentrated from the Jackson Lake Lodge sewage ponds (≤ 0.05 level), but not algae from Jackson Lake.

Nutrient Limitation of Aquatic Primary Production
in Grand Teton National Park
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Samples of water were collected from Jackson Lake for use in the Algal Assay Procedure Bottle Test. Selenastrum capricornutum is being used as the assay organism. Assays using lake water, lake water plus additions of PO_4^{3-} , NO_3^- , PO_4^{3-} and NO_3^- , and filtered water from the Jackson Lake Lodge sewage ponds are presently underway. No data are available yet.

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