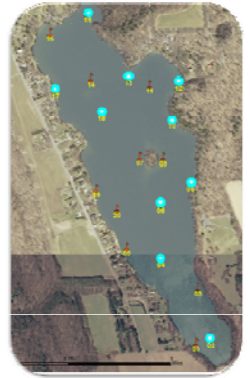


Zooplankton of Song Lake

Ceili Bachman and Emily Ogburn



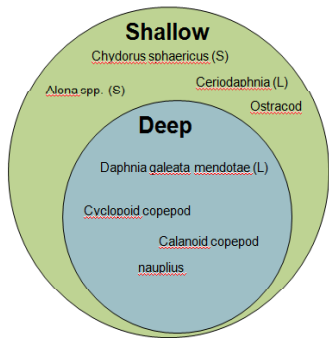
Introduction

Zooplankton are important in lake food webs; they serve as food for fish and are also the main grazers of phytoplankton. Zooplankton in freshwater lakes are known to have a heterogeneous horizontal distribution¹. This so-called patchiness, could be caused by a variety of factors including behavioral responses to other zooplankton or other organisms (social, reproductive or predator-prey relationships)^{1,3}, water movement, differences in reproduction rate¹, or spatial variability in food resources². Also, considerable differences in near-shore and offshore zooplankton communities are common⁴.

Objectives

This study aimed to investigate zooplankton patchiness in Song Lake, NY, and determine whether the historic sampling site (site 6) was representative of the zooplankton community in the lake. Zooplankton in Song Lake have not been sampled as part of the annual Citizens Statewide Lake Assessment Program (CSLAP) monitoring of the lake, so data collected will also serve as a preliminary investigation into the zooplankton that inhabit Song Lake.

Taxa Identified



Methods

Twenty sites were sampled in Song Lake, located in Tully, NY.



The zooplankton sample was poured into a bottle and 90% ethanol was added. Ten preserved samples were concentrated to a known volume.

All the zooplankton in subsamples were counted and identified until 100+ zooplankton were identified for each sample.

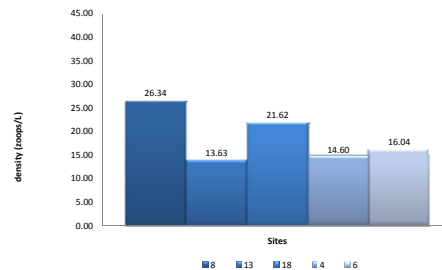
The zooplankton net was lowered vertically to maximum depth.

The net was hauled up at an even rate of about 1 m*sec⁻¹, trapping zooplankton and funneling them into the cod end of the net.

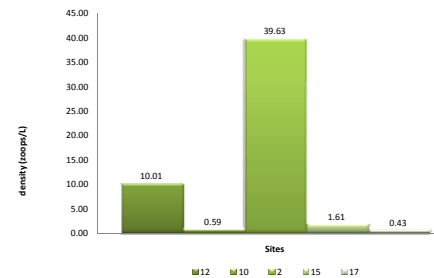
Results

Sites were grouped as shallow (0-2m) and deep (4-6m), as these two depth ranges showed substantial differences from one another.

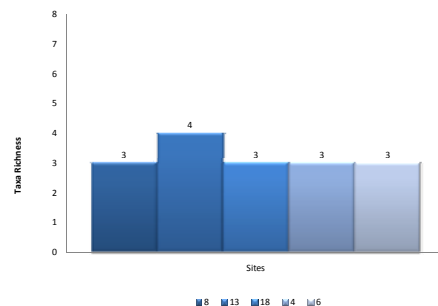
Zooplankton Density at Deep Sites



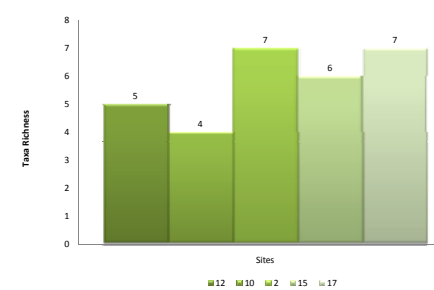
Zooplankton Density at Shallow Sites



Zooplankton Richness at Deep Sites



Zooplankton Richness at Shallow Sites



Discussion

Eight zooplankton taxa were identified in Song Lake. All of the species identified were found at shallow sites, but deep sites had only four of the total eight taxa found. The mean density (zoops/L) of shallow and deep sites were 10.46 and 18.45, respectively, but the differences in density were not significant. Sørensen's index of 0.667 shows that the zooplankton taxa composition between deep and shallow sites are somewhat similar. The taxa richness was significantly greater at the shallow sites (P-Value = 0.014, $\alpha=0.05$). Simpson's diversity index was statistically higher at the shallow sites (P-Value = 0.015, $\alpha=0.05$). Small cladoceran zooplankton were found only in the shallow sites, perhaps because their size allows them to evade planktivorous fish that inhabit the near-shore zone.

Most literature reports that zooplankton distribution in lakes is not uniform^{1,2,3,4}. A detailed study of two kettle lakes in Canada also found that zooplankton were very patchy, but did not find correlation between distribution and depth⁵.

When sampling for zooplankton on Song Lake, patchiness is to be expected, and multiple samples should be taken from shallow, deep, and intermediate sites around the lake in order to collect a complete representation of the community in the lake.

References:

1. George, D.G. 1981. Zooplankton Patchiness. Annual Report of the Freshwater Biology Association 49: 32-44.
2. Neary, J.; Cash, K.; McCauley, E. 1994. Behavioural Aggregation of Daphnia pulex in Response to Food Gradients. Functional Ecology 8: 377-383.
3. Foll, C.L.; Burns, C.W. 1999. Biological drivers of zooplankton patchiness. TREE 14: 300-305.
4. Hall, S.R.; Paulukonis, N.K.; Mills, E.L.; Rudstam, L.G.; Schneider, C.P.; Lary, S.J.; Arrhenius, F. 2003. A Comparison of Total Phosphorus, Chlorophyll a, and Zooplankton in Embayment, Nearshore, and Offshore Habitats of Lake Ontario. Journal of Great Lakes Research. 29:54-69.
5. Malone, B.J.; McQueen, D.J. 1983. Horizontal patchiness in zooplankton populations in two Ontario kettle lakes. Hydrobiologia 99: 101-124.