

Chapter V.1  
ZOOPLANKTON

Introduction

Zooplankton assemblages show a variety of responses to acidic inputs. Surveys conducted in Scandinavia, Canada, and the United States show that the number of zooplankton species declines with decreasing pH (Sprules 1975, Almer et al. 1974, 1978, Leivestad et al. 1976, Wright et al. 1976, Roff and Kwiatkowski 1977, Raddum et al. 1980, Confer et al. 1983, Yan and Strus 1980, Fryer 1980, Brezonik et al. 1984, Siegfried et al. 1984, Carter et al. 1986, Keller and Pitbaldo 1984). A number of studies also indicate that zooplankton abundance or biomass is lower in acidic than in non-acidic lakes (Yan and Strus 1980, Roff and Kwiatkowski 1977, Almer et al. 1978, Dillon et al. 1979, Brezonik et al. 1984, Confer et al. 1983).

Experimental and survey data show shifts in zooplankton community structure with decreasing pH. Among microcrustaceans, daphnids, Epischura, Leptodora, and Tropocyclops appear to be very sensitive to acidic inputs (require pH > 5.0); Holopedium, Diaphanasoma, Mesocyclops, and Cyclops seem to tolerate pHs to the mid to low 4's; and bosminids and some diaptomid copepods often dominate in the most acidic conditions (Almer et al. 1974, 1978, Raddum et al. 1980, Sprules 1975, Roff and Kwiatkowski 1977, Carter 1971, Marmorek 1984, Janicki and DeCosta 1979, Yan and Strus 1980, Keller and Pitbaldo 1984, Brezonik et al. 1984, Confer et al. 1983, Carter et al. 1986, DeLisle et al. 1984, Blouin et al. 1984, Chengalath et al. 1984). Polyphemus pediculus and Chydorus sphaericus are also commonly collected in acidic waters (Sprules 1975, Roff and Kwiatkowski 1977, Yan and Strus 1980, Keller and Pitbaldo 1984, Confer et al. 1983). There are many exceptions, however, to this general tolerance scheme. For example, Daphnia catawba and Daphnia ambigua seem relatively tolerant of low pH, whereas most other species of daphnids are absent in acidic waters (Keller and Pitbaldo 1984, Sprules 1975, Carter 1971, Brezonik et al. 1984). Diaptomus sicilis, D. tyrrelli, and D. oregonensis often disappear as pH decreases, whereas D. minutus, D. reighardi, D. floridanus, and D. gracilis often dominate in acidic lakes, depending on geographical area (Sprules 1975, Carter 1971, Almer et al. 1974, 1978, Marmorek 1984, Keller and Pitbaldo 1984, Confer et al. 1983, Brezonik et al. 1984). In Norway, the large copepod Heterocope saliens often dominates acidic lakes, whereas in Sweden, H. appendiculata is restricted to