

GROWTH AND LONGEVITY OF NAIADS FROM FISHERY BAY IN WESTERN LAKE ERIE

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(ABSTRACT)

The pearly freshwater mussels or naiads of Lake Erie have long been noted for the distinctness and consistent periodicity of the growth lines laid down upon the periostracum of their shells. The stabilizing effect of this large mass of water insures relatively slow uniform temperature changes. This eliminates the primary cause of the numerous false annular rings found so commonly in stream naiads.

A total of nearly a thousand specimens of the three subfamilies of the Family Unionidae found in this area were used in this study. All twenty-seven species present were studied, using the annular ring method of Chamberlain (1931).

An examination of the resulting data and the growth curves drawn from them demonstrated that for *all* species:

1. Growth was most rapid during the first 2-5 years of age regardless of habitat.
2. Individuals living in deeper water having less current and finer sediments grew more slowly than the same species living in shallower water having more current and coarser sediments.
3. Growth rate decreased slowly and steadily after the first 1-3 years of life even though the individual may have lived to 40 years of age.

It was found that the three subfamilies of the Family Unionidae could be characterized as follows:

Ambleminae Morrison, 1955. (= Unioninae Ortmann, 1910, in part.)

Species of this subfamily usually have heavy sculptured shells, a complete hinge, are summer breeders and found more abundantly in the substrates of riffles or shoals (i.e. swift waters) of our streams.

These naiads are typically slow growing but live to be very old. All seven species of this group in this study commonly live to be over 20 years of age and several having over 40 annular rings were found.

Subfamily Anodontinae (Swainson, 1840) Ortmann, 1910.

Species of this subfamily are usually thin-shelled, lack shell sculpture, have incomplete hinge dentition or none, are winter breeders and are

the naiads most characteristic of fine sediments and quiet waters (i.e. our true ponds and lakes as well as the pooled portions of our streams).

These naiads are typically rapid growing, early maturing species having a relatively short life span. The extreme of this group in Lake Erie is apparently *Anodonta imbecillis* Say, which matures in its second year but rarely lives to be 5 years of age.

Subfamily Lampsilinae (von Ihering, 1901) Ortmann, 1910.

Species of this subfamily seem to be generally intermediate between the Unioninae and the Anodontinae. The shell is intermediate in weight, seldom sculptured and having a complete, if sometimes weak, hinge dentition. These species are typically winter breeders and, while at least some are found in all three stream habitat areas (riffle, run, and pool), they are most abundant in the firm, sand-gravel substrates of the runs.

These naiads are, as a group, intermediate in both growth rate and longevity although a few species could easily be grouped with one or the other subfamilies with respect to these characteristics. It is only in this subfamily, however, that sexual dimorphism is the rule in both shell form and growth rate. In length the males, with rare exception, grow faster after maturity than the females of the same species. It appears that what the males gain in length is gained by the females in width, and in weight there may be little if any difference. The age of maturity was found to be 3 years for all the species of this subfamily collected gravid from the shallow parts of Fishery Bay. Specimens of the same species from the deeper waters (30'-50') and finer sediments of western Lake Erie were not found to mature until 4, 5, or even 6 years of age though they might live much longer.

Because the growth rate is most rapid in juveniles, slower in mature adults, and slowest though persistent during senility, the reproductive life history of the individual is recorded in the annular rings upon the surface of the shell of most genera of the Lampsilinae.