

DIATOM LIFE CYCLES: COUNTING THE COSTS.

David Jewson

Freshwater Laboratory, University of Ulster

The number of known species of diatoms has increased from 50 in the early Cretaceous to more than 100,000 at present. One adaptation that has contributed to this increase in diversity is the cycle of size decline and size regeneration (Diatom Sex Clock), which is used to time life cycles longer than one year. However, there are only a very few species where we have a full understanding of the quantitative impact (i.e. 'cost'). Part of the reason for this is that sexual reproduction has evolved in such a way that it does not usually interfere with the increase in cell numbers by asexual reproduction. As a result it is often overlooked or considered unimportant in studies of populations in natural environments. In most other plant and animal groups, the significance of recruitment, mortality, and length of the life cycle are fundamental to understanding population dynamics and evolution. Results will be presented from a range of species, including long-term studies of *Aulacoseira* and *Hannaea* populations in Lake Baikal, to show how the impact of sexual reproduction can be quantified and put into a context of other related factors (such as size decline, nutrient limitation, grazing, sedimentation, etc.) over the length of the life cycle.