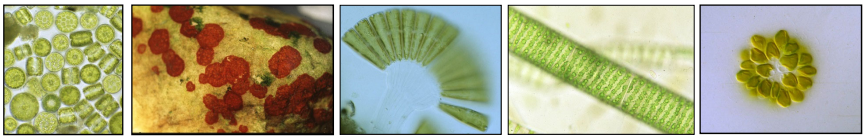
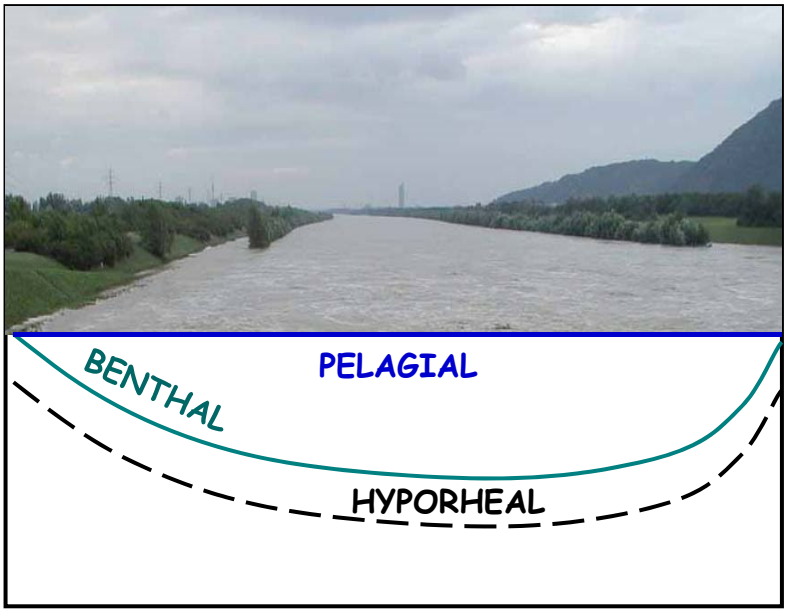
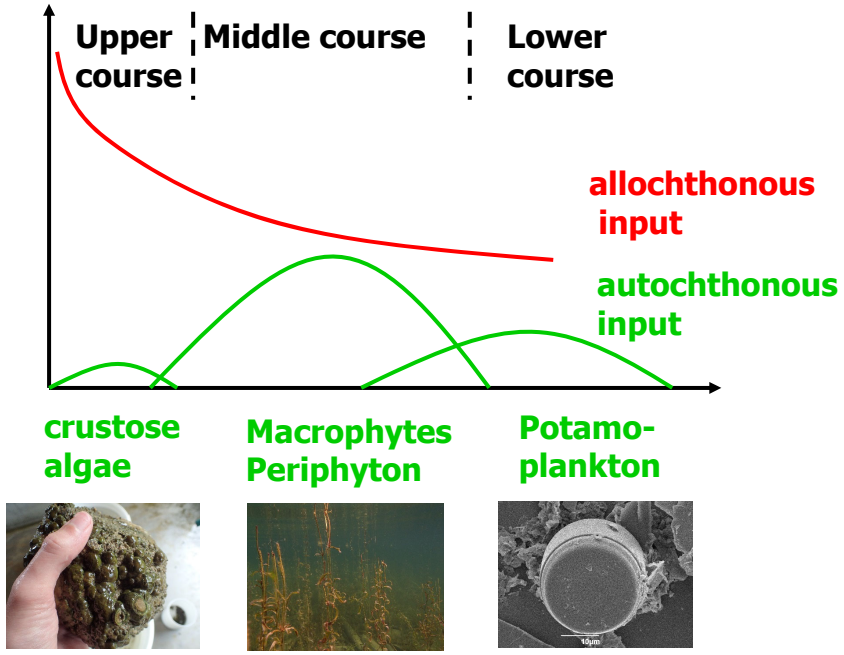


Algae in running waters

Freshwater Biodiversity
ao. Univ. Prof. Dr. Michael Schagerl





Adaptations to litoral of fast-flowing streams

Flexible thalli

Gelatinous stalk systems

Gelatinous pads

Crusty coats

Pustule/blister-like, carbonate-incrusted habitus

Key variables for colonization of stream litoral

Geochemical properties

- Hydrogen carbonate-type
- Silikate-type
- Chloride-type
- Sulfate-type

Geochemical properties

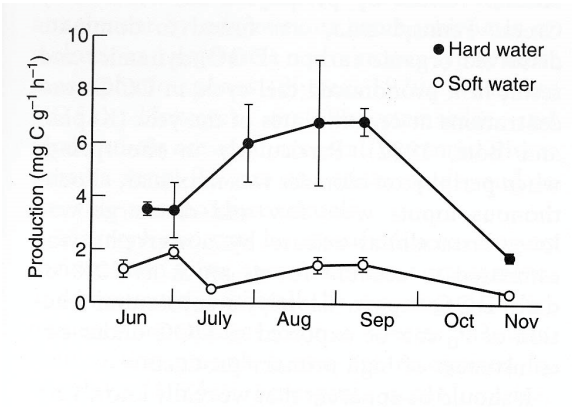


FIGURE 4.11 Primary production of periphyton measured by ^{14}C uptake using substrate placed in recirculating chambers, at two sites in the New River, Virginia. The river has a wide, shallow, bedrock channel and swift flow; the soft-water site has about 15 mg l^{-1} $CaCO_3$, compared with about 45 mg l^{-1} at the hard-water site. (From Hill and Webster, 1982a.)

Temperature

- Summercold (0 - 17°C)
- Summerwarm (17 - 29°C)
- Warm (29 - 40°C)
- Hot springs and streams (> 40°C)

Current

- Holdfasts (rhizoids)
- Lenght of glatinuous stalks

Substrate

Surface (rough versus smooth)

Nutrient release from substrate

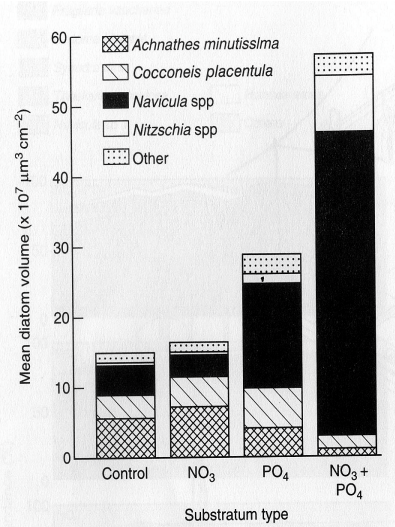
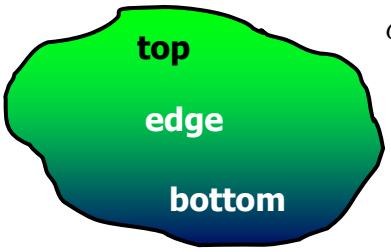


FIGURE 4.8 The relative biovolume abundance of diatoms colonizing nutrient-releasing substrates made of a sand–agar mixture and placed in a nutrient-poor stream in northern Michigan. The response was due to two motile pennate diatoms, *Navicula* and *Nitzschia*, and occurred only with phosphate enrichment. (After Pringle and Bowers, 1984.)

Light supply

- characteristic zonation along pebbles

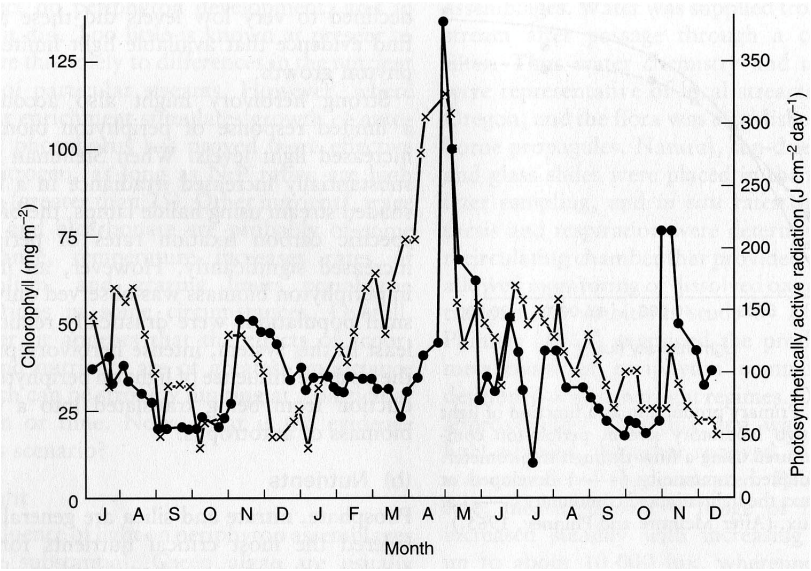


Gongrosira, Hildenbrandia,...

Pleurocapsa,...

endolithische Algen

Light supply



Nutrient supply from water column

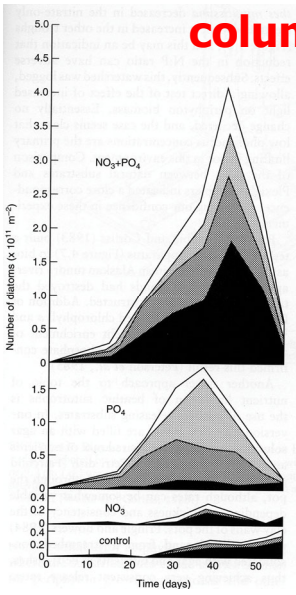
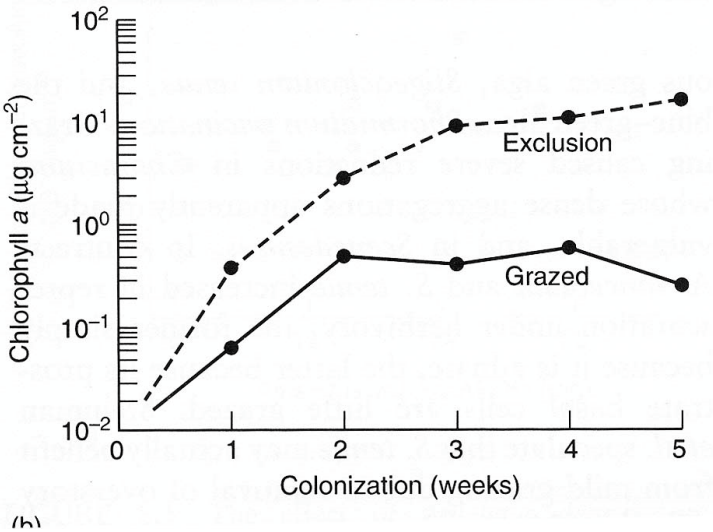


FIGURE 4.5 Changes in the numbers of the dominant diatom species in troughs enriched with NO_3-N, PO_4-P, or both in combination. Troughs were placed in Carnation Creek, Vancouver Island, allowed 4 weeks to colonize, and then fertilized for 52 days. Note that periphyton populations peaked after 30–40 days, and then declined sharply, prior to termination of the fertilization experiment. (After Stockner and Shortreed, 1978.)

Grazing



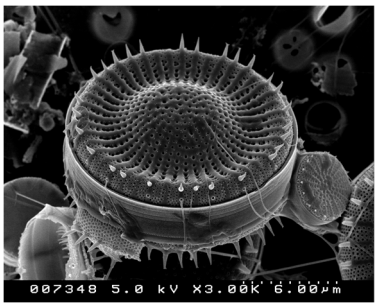
Potamoplankton

self-sustaining populations reproducing in streams and rivers

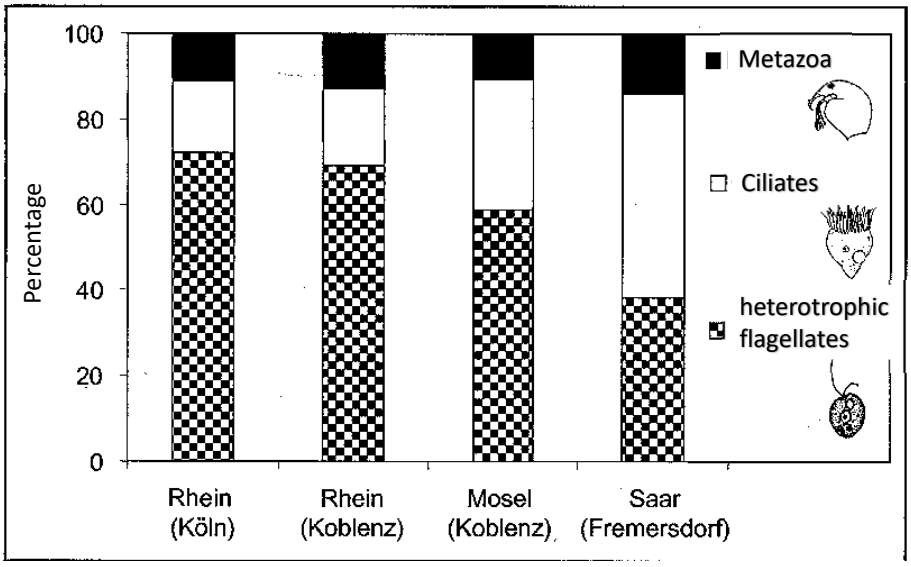
do not mix up with Tychoplankton: imported from adjacent systems

Typical zonation along a river course

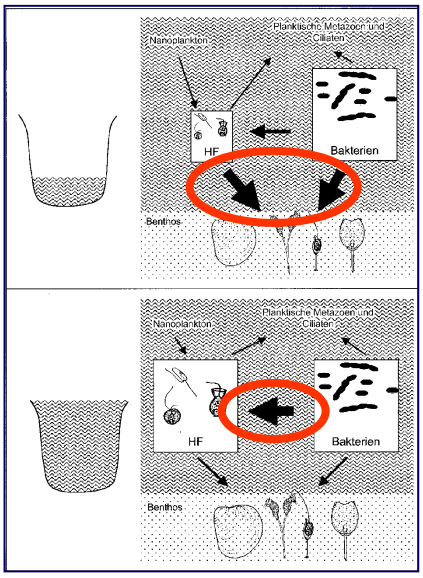
- headwaters plankton-free
- mid-sections with tychoplankton
- lower reaches with potamoplankton (e.g., *Cyclotella* sp.)



Potamoplankton



Potamoplankton – control mechanisms



Low water level

High water level