Efficiency of fish feeding on plant-attached prey: Effects of inorganic turbidity and plant-mediated changes in the light environment

Nurminen, Leena, Jukka Horppila

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ABSTRACT: We studied the effects of inorganic turbidity on the efficiency of perch (*Perca fluviatilis*) feeding on the cladoceran *Sida crystallina* attached to floating macrophyte leaves together with the effects of the floating leaves on the light environment. We expected feeding efficiency to decrease constantly along an increasing turbidity gradient without an enhancement in moderate turbidity values, as observed with planktivores feeding on free-swimming prey, because the inherent contrast between the prey and its background should not be affected by water quality when the prey is attached to a floating object. In the 2-h feeding experiments, the average feeding rate of perch at 0 NTU (nephelometric turbidity units) turbidity was 6.5 *S. crystallina* fish^{-1}, whereas the feeding rates at 15 and 20 NTU were 1.1 and 0.4 *S. crystallina* fish^{-1}, respectively. At 30 NTU, no *S. crystallina* were captured. The results thus supported our hypothesis. Additionally, the low feeding rate of perch even in clear water suggested that the feeding conditions underneath floating macrophyte leaves were inherently unpropitious for perch because light environment underneath a floating leaf is dominated by harmful sidewelling light. The effects of macrophyte leaves on the spectral composition of light may also be unpropitious for fish feeding. Additionally, with motionless plant-attached prey fish cannot use their lateral line in prey detection or change to filter feeding when their visual field is reduced by increasing water turbidity.