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The predatory Chironomidae of an iron-rich stream: feeding ecology and food web structure

ALAN G. HILDREW, COLIN R. TOWNSEND* and AZIM HASHAM
School of Biological Sciences, Queen Mary College, London, and
*School of Biological Sciences, University of East Anglia, Norwich

ABSTRACT. 1. Three species of Tanypodinae (Chironomidae) were found in an acid and iron-rich stream in southern England. Maximum abundance was achieved in summer and they were sparse at other times. Individuals were aggregated on the stream bed and were over-represented in accumulations of leaf litter.

2. The diets of all three species consisted of a mixture of prey (prominently detritivorous chironomid larvae) and detritus. More detritus and fewer prey were taken in winter than in summer.

3. When comparing large tanypod species with small and, intraspecifically, late instars with early, the proportion of guts containing prey increased with increasing body size.

4. Stonefly larvae were more prominent in the diet of *Zavrelimyia barbatipes* (Kieffer) in summer than in winter but for the other two species the reverse was true. A bigger proportion of *Trissopelopia longimana* (Staeger) guts contained prey in early summer than in August whereas more *Macropelopia goetghebueri* (Kieffer) guts contained prey in August. This was apparently a consequence of seasonal differences in the distribution of body size among the populations of these two species.

5. The stream contains two further common predators, *Plectrocnemia conspersa* (Curtis) and *Sialis fuliginosa* Pict. These are important predators of tanypod larvae but might also compete with them since they severely deplete populations of prey taken in common.

6. Analysis of the food-web in Broadstone Stream reveals remarkably high values of connectance (C and C_{max}) and of species richness times connectance (SC_{max}). Such characteristics are theoretically associated with fragile and dynamically unstable food webs, and may be found in 'constant' environments. There is also an apparently unusual prevalence of omnivory in the community.

Key words. Tanypodinae, streams, acid, predators, feeding, ecology, food webs.

Correspondence: Dr A. G. Hildrew, School of Biological Sciences, Queen Mary College, Mile End Road, London E1 4NS.