

in situ experiments to assess the abundance of microflora and micro-meiofauna in mature biofilms, in four rivers located in southwest France, stressing their quantitative importance (averaging 50% of the total number of organisms counted). We highlighted that the balance between microflora and micro-meiofauna depends on local environmental conditions, and specific taxon selection is likely to provide information on river pollution. Indeed, microalgae were directly favoured by nutrients and indirectly by biocides targeting micrograzers. In contrast, micro-meiofauna was predominant in sites where herbicides were found, in particular photosynthesis inhibitors (e.g. in the River Pontails, 97% micro-meiofauna). Although the prey–predator relationships in the laboratory experiment appeared to depend on the initial pools of microorganisms during the first days, they reached stable states within a week. Then, all cultures stabilized around a ratio of $20 \pm 6 : 1$ prey/potential predator. Further research is required to better understand the abiotic (water quality, habitat) and biotic (traits of the organisms present) drivers governing the coexistence of microalgae and their predators across the microbial landscape, and its consequences on the structure and function of the aquatic ecosystem.