Colonisation of gravel lakes by Chironomidae

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With 6 figures and 2 tables

Abstract: The Environment Agency (England and Wales) has constructed a flood relief channel through gravel substrata for the River Thames to bypass the towns of Maidenhead and Windsor. As they were dug, sections of channel flooded with groundwater to create a series of lakes. Colonisation of lakes was monitored by collecting floating pupal exuviae discarded by emerging adult Chironomidae. The same technique will be used for future monitoring of the new channel. Six lakes were sampled four times during 2000. Lake age at the time of the first sample ranged from four months to 3 years, with surface area from 0.2 to 7.0 ha. Despite a contiguous groundwater source, the lakes exhibited significant chemical differences. Sixty-eight species were identified, including some atypical of the region. In common with other lake colonisation studies, there were high proportions of predators although detritivores were dominant. Species diversity was unrelated to lake age, however, the oldest lakes could be discriminated from the youngest lakes on the basis of their species composition. The principal gradient of species change between lakes was correlated with alkalinity. This had been demonstrated in surveys of other lakes in England and Wales, although conductivity was a better discriminator of lake type. Weighted average regression and calibration of chironomid data from established lakes provided good estimates of conductivity for the new lakes. Results suggest these new lakes were rapidly colonised to an extent that predictive models based on mature lakes were applicable.

Key words: Chironomidae, colonisation, pupal exuviae, lakes, conductivity, feeding group.

Introduction

There are 588 species of Chironomidae (non-biting midges) recorded in the British checklist (Chandler 1998), many of which are among the first invertebrates to colonise new habitats (e.g. Cantrell & MacLachlan 1977, Barnes 1983, Milner 1987, Hare 1995). Species establishing themselves in a lake

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