Life-history patterns and spatial and temporal overlap in an assemblage of lotic Plecoptera in the Araglin Catchment Study Area, Ireland

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With 5 figures and 5 tables

Abstract: Irish streams have fewer macroinvertebrate species than those of continental Europe, and thus offer useful natural models for the study of community patterns and processes. Plecoptera distribution and spatial overlap amongst species were examined across 15 sites in the River Araglin Catchment Study Area in southwest Ireland over a three-year period; the larval life histories and temporal overlap of nine species were examined in detail at two of the sites over twelve months. *Chloroperla tripunctata* took two years to complete larval growth, whilst all of the other species – *Siphonoperla torrentium*, *Isoperla grammatica*, *Leuctra fusca*, *L. inermis*, *L. hippopus*, *Protonemura meyeri*, *Amphinemura sulcicollis* and *Brachyptera risi* – were univoltine. Three additional species occur in the Araglin catchment but not at either of the two intensively-studied sites – *Nemurella pictetii*, *Nemoura cambrica* (in smallest streams) and *Perla bipunctata* (in the main river). Apparent temporal segregation between closely related Plecoptera has been reported by others, and two cases were examined in detail in this study. The overlap of observed seasonal growth patterns in three *Leuctra* species was lower than most simulated overlaps based on alternative model permutations of their respective seasonal distributions; under the rather conservative model used, provenance of the low overlap by chance (p < 0.05) could not be rejected. Temporal segregation of larval growth amongst two Chloroperlidae species was also compelling visually but this arose from their differing voltinism, rather than the absolute timing of their specific larval growth periods. An inverse correlation between temporal and spatial overlap of the detritivorous species might be expected if species with contemporaneous growth patterns were competing for similar resources. At the spatial scale of typical benthic samples and at the catchment scale examined here, however, no such relationship was found.

Key words: Plecoptera, life history patterns, niche partitioning, spatial distribution.

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