

Austalian Mayfly (Ephemeroptera) Burrowers: Their Systematics, Burrowing Behavior, Adaptation, and Evolution

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Burrowing mayflies from the Ephemeroidea are absent from Australia but several taxa, mainly within the Leptophlebiidae, e.g. *Jappa* and *Ulmerophlebia* (Leptophlebiidae), have adapted to freshwater hyporheic habitats. *Jappa* bears paired head frontal processes or horns superficially similar to the mandibular tusks in Ephemeroidea, while *Ulmerophlebia* lacks any such structures. In the present study, the Australian mayfly burrowers are comprehensively treated in terms of their biodiversity, habitats, types of burrowing, functional morphology of burrowing devices, behavioral and ecological adaptation, and evolution. Particular discussion is given to the morphological and behavioral convergence between the Australian burrowers (*Jappa* and *Ulmerophlebia*) and their Holarctic counterpart the Potamanthidae (Ephemeroidea). Other Australian mayfly burrowers, e.g., *Tasmanophlebia* (Oniscigastridae), and *Tasmanocaenis* (Caenidae), and their burrowing habits are additionally discussed as is *Kalbaybaria* (Leptophlebiidae).