

How effective are different lights for collecting adult aquatic insects?

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Eligible for student prize

Light-trapping is a common method used to collect flying insects, including adult stages of aquatic species. Most commonly, a light for attracting insects is suspended over a dish of liquid into which they fall, or the light is positioned inside a trap and insects are directed into a container of preservative. The light used to attract insects ranges from low-intensity fluorescent tubes run by batteries, to high-intensity vapour lamps run by a generator. Light in the ultraviolet spectrum is preferred, and an assumption of 'the brighter the better' is generally made. A literature review revealed little useful information on the effectiveness of differing wavelengths or intensities of light for trapping aquatic insects. We therefore decided to examine the effect of differing light configurations on capture rates of adult stages of aquatic insects. In a field trial using five Northland forest streams, over eight consecutive nights in late October 2013, we tested the effectiveness of different lights - Blacklight (BL), Blacklight-Blue (BLB), Cold White light (CW), and a BL/CW combination - to attract adult aquatic insects. We tested these at two low intensities (16 or 32 watts). Catches were analysed for species richness and abundance of Ephemeroptera and Plecoptera, and abundance only for Trichoptera (caddis identification still in progress). All light types attracted adult Ephemeroptera, Plecoptera and Trichoptera but BLB and BL lights were most effective. 32 watt lights were more effective than 16 watt, however differences were not significant ($P > 0.05$). Also, in the interest of reducing non-target taxa we investigated the abundances of terrestrial Coleoptera, Lepidoptera and Diptera. Terrestrial insect results mostly mirrored those of the aquatic taxa, however BL outperformed BLB for Lepidoptera. This may indicate that BLB could be more useful in aquatic studies, producing good aquatic insect catches with less by-catch, though more testing is needed.

