

The Curious Case of the Insect Engineer

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Richard Mason, Department of Geography, University of Loughborough, r.j.mason@lboro.ac.uk



Summary

The importance of biology in fluvial geomorphology is often overlooked. The larvae of caddisfly, an abundant aquatic invertebrate, build cases from fine sediment. Thanks to the BSG grant I attended EGU to present my research quantifying the use of sediment by caddisfly and the potential geomorphic repercussions.



The Project

Traditionally, fluvial geomorphology has focussed on physical processes within river systems. Increasingly, however, animals and plants are recognised as having substantial impacts on the erosion, transport and deposition of sediment. Caddisfly (Trichoptera) are sediment engineers. The construction of structures, including mobile and static homes (cases), has enabled this order of aquatic insects to cope with a wide range of environmental conditions and become exceptionally widespread, abundant and diverse. However, the extent and geomorphic consequences of caddisfly case building has received little attention.

Figure 1. Case building caddisfly coating a rock, R. Dove, U.K.

This presentation focussed on a study which quantified the mass and size distribution of mineral sediment used by case building caddisfly in a U.K. gravel-bed stream. The mass of sediment used by case building caddisfly averaged 31.81 g m⁻². This was primarily coarse sand although a wide range of grain sizes were found in caddisfly cases (0.063 – 4 mm). Sediment use was dominated by surface dwelling taxa, significant because these species may alter sediment sorting at the sediment-water interface, potentially important for the fluvial transport of sediments. These results provide an important preliminary step in developing a fuller understanding of the geomorphic impacts of these widespread and abundant ecosystem engineers and the wider importance of biology within fluvial geomorphology.

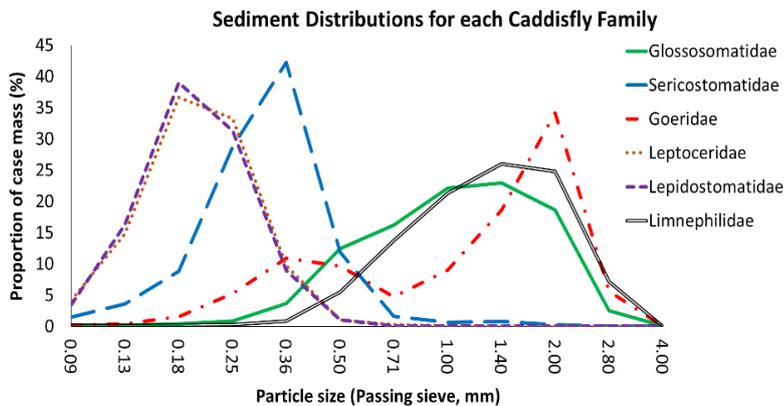


Figure 2. Sediment distributions for constituent particles in the six case building caddisfly families found in this project.



Figure 3. Presenting the research in the Biogeomorphology session at EGU.

Impacts of the grant

The grant from the BSG was gratefully received. The BSG have been important throughout this research with initial findings presented via poster at BSG 2017 in Hull. The presentation was well received and was followed by some useful questions. One question, relating to the longevity of caddisfly cases, has prompted the next project for my PhD research. Furthermore, the conference gave me the opportunity to attend a number of very useful sessions, which, coupled with networking, have helped to shape the future of my PhD. In addition, thanks to the BSG grant, I was able to co-convene a session. Entitled 'Crowd solving problems in earth science research' the session was organised by a group of early career geomorphologists from across Europe. The session aimed to tackle challenges facing geomorphologists via a more interactive and accessible means than traditional conference presentations.

Links;

1. Presentation Abstract: <http://tiny.cc/h7qjwy>
2. Crowd solving session blog post: <http://tiny.cc/99qjwy>