



CADDISFLIES: RIVER ENGINEERS

Net-spinning caddisflies may prove to be a key indicator of river health, as climate change leads to reduced flows in Victorian streams. Brett Downey, a PhD student in the School of Life and Environmental Sciences at Deakin University, is studying these creatures, to discover their role in the river ecosystem.

“They are ecosystem engineers,” he explains, “they build themselves a retreat with a dome-shaped net spun out of silk”. They use the net like a sieve to filter the water column for food particles. A single rock the size of your hand might have 100 or 150 caddisfly nets on it, and the aggregation of nets affects water flow.”

By comparing sites where the larvae are present with sites where the larvae have been removed, Brett has found that during summer, when the river bed is choked with algae, the presence of caddisfly nets increases water flow over the stream bed.

“I injected dye onto the substrate and measured its residence time. Without the caddisflies, the dye took much longer to flow through an area – about 25 seconds compared with five seconds when the nets are present,” he says.

A higher flow rate means that oxygen availability may be higher at net sites. At the same time, the nets increase nutrient retention, supplying more food to the benthic (bottom-dwelling) animals.

The net-spinning caddisflies only live in stream sections with fast water flow. Brett’s results show that their presence helps to maintain flows over the stream bed, where the water column interacts with the benthic community.

Other species, such as the larvae of stoneflies and black flies, are also dependent on water flow. Understanding the relationships between the caddisflies and the wider benthic community is important as these invertebrates are vital links in the food chain, which supports larger insects, fish and birds.



Brett Downey

“The presence of the caddisflies may be what makes an ecosystem suitable for some of these other species,” says Brett. “As river flows decrease with climate change and water extraction the level of stress on the ecosystem increases. If a suite of benthic invertebrates rely on habitats created by caddisflies, then the presence or absence of caddisflies may be used as an indicator of river health. If caddisflies can no longer survive in a stream, then the ecological implications may be far-reaching.”

At the end of his research project, Brett will know exactly how important the net-spinning caddisflies are.

‘The presence of caddisfly nets increases water flow over the stream bed.’



Net-spinning caddisfly net
Image: N. Thomas

FURTHER INFORMATION:

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