The use of *in-situ* deployments to examine the success of water quality mitigation measures on a watercress farm

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Introduction

Watercress has long been believed to affect macroinvertebrate communities in chalk streams [1]. Harvesting and washing watercress damages plant tissues and releases isothiocyanates which are potential toxicants to *Gammarus pulex* (L.) [2].

This study examined whether impacts on *G. pulex* of watercress farm factory wash water could be mitigated by treating via recirculation through the watercress beds.

Method

Deployments of caged *G. pulex* [3] were made in water carrier channels in peak growing season on two consecutive years. Borehole water only fed beds were used as controls. A 7-day immobilisation endpoint was recorded.

Results

Immobilisation (as % of total organisms deployed) was greatest in the wash water supply on 6 out of 8 occasions.

One way ANOVA with pairwise multiple comparisons (Holm-Sidak Method) was used to compare effects at each location (see table below).

Two way ANOVA on ranks with pairwise multiple comparisons was used to compare the response between and within sites. It revealed a statistically significant difference between responses of organisms in the wash water supply carrier to those in the carrier below the bed on 4 out of 8 test occasions.

Conclusions

Impact to *G. pulex* was variable, but overall reduced to levels comparable to controls after the factory wash water had been fed back through a watercress bed.

Re-direction of watercress wash water through the watercress beds prior to discharge to the receiving water is a positive treatment/measure.

Recent biological surveys [4] of the receiving water at the farm indicate that macroinvertebrate communities are recovering.

References


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