

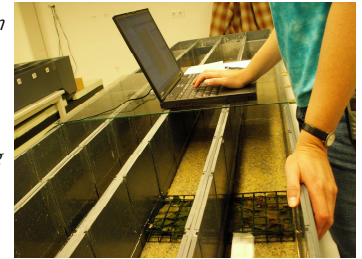
# HYDROMORPHOLOGICAL DISTURBANCE in sandy lowland streams - an experimental approach

Dorine T.B.M. Dekkers<sup>1</sup>, Piet F.M. Verdonchot<sup>1</sup>

## Introduction

Hydromorphological conditions in lowland streams will change due to an increase of discharge peaks induced by climate change. Substrate stability, a key parameter at habitat scale for macro-invertebrates, will decrease. The effect of substrate disturbance on Trichoptera that represent three stream specialists (*Halesus radiatus*, *Micropterna sequax* and *Chaetopteryx villosa*), and three stream ubiquitous (*Anabolia nervosa*, *Limnephilus lunatus* and *Mystacides longicornis*) were tested, using laboratory experiments (figure 1).

fig 1. Experimental unit: an artificial stream with 4 gutters, each with one substrate compartment. The substrate is manually disturbed by current velocity changes, covering with sand or stirring the substrate. Behavior of individuals (n=20) was scored.



## Current velocity

The number of animals leaving the substrate during disturbance depended on current velocity and differed between species (figure 2). E.g. during substrate disturbance at high current velocity more *H. radiatus* left (figure 3). *M. sequax* appeared least sensitive, and *A. nervosa* most sensitive to current velocity.

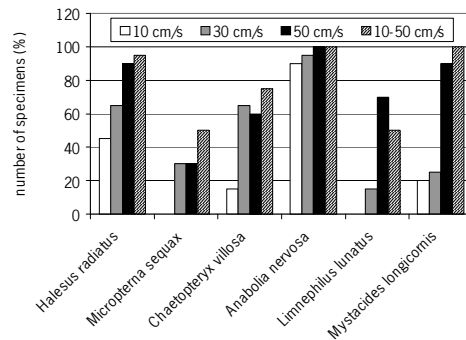


fig 2. Number of specimens leaving the substrate during disturbance by different current velocities.

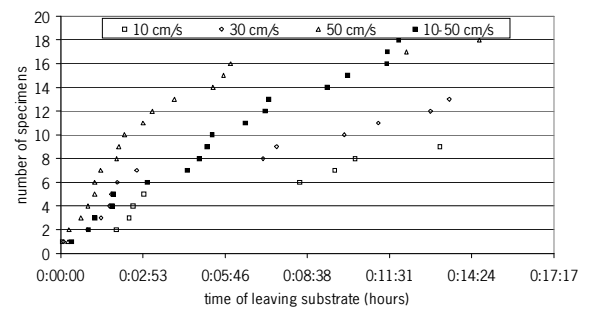


fig 3. Response time of *H. radiatus* specimens leaving the substrate during disturbance by different current velocities.

## Stirring substrate and covering substrate with sand

The effect of stirring or covering the substrate with sand depended on the species. All *H. radiatus* left the substrate within 2 minutes when stirred (figure 4). Whereas more than 50% of *M. sequax* and *C. villosa* remained in the substrate when stirred. *H. radiatus* and *M. sequax* did not respond to sand cover (figure 5). The other species showed a death rate of almost 50% after sand cover.

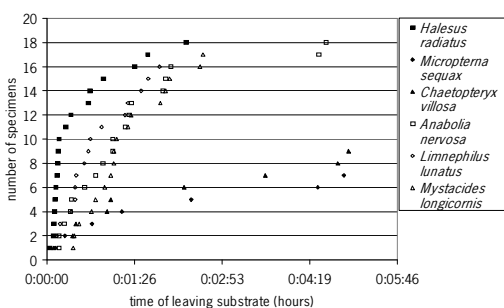


fig 4. Response time of specimens leaving the substrate during stirring.

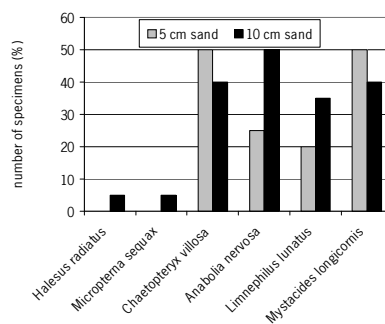


fig 5. Number of dead specimens (at t=14 days) after a 5 or 10 cm of sand cover.

## Conclusion

Response to disturbance differed between type of disturbance and species. No general response pattern related to either stream specialists or ubiquitous was detected. E.g. *H. radiatus* appeared sensitive to substrate stirring but did not respond to sand cover. On the contrary, *C. villosa*, another specialist, did not respond to stirring but appeared very sensitive to sand cover. Only one of the six species, *M. sequax*, did not respond to any of the disturbances.