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Density-related dispersal of newly hatched caddisfly larvae (Hydrobiosidae): a field experiment across 10 riffles

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Density-related dispersal of newly hatched caddisfly larvae (Hydrobiosidae): a field experiment across 10 riffles

Recruitment of insect larvae via egg-laying is understudied in streams. Egg-laying can be limited in a density-dependent way by densities of rocks that protrude from the water and provide egg-laying habitat. Riffles with more 'emergent rocks' may receive more egg masses but this may not result in higher densities of larvae if rates of egg mortality, larval mortality, or larval dispersal are also density-dependent.

To test whether egg-laying limits local larval densities we conducted a large field experiment in Taggerty River, Victoria, Australia. In 10 riffles we manipulated the density of emergent rocks to manipulate supply of eggs and prospective larvae entering riffles.

Densities of eggs in each riffle were compared with densities of neonate larvae in the riffle and in the run (no egg-laying habitat) immediately downstream, to determine whether neonates remain in natal riffles or disperse to areas downstream. To measure drift dispersal we collected concurrent samples of neonates drifting into and out of each riffle.

Similar patterns were observed for two common genera. Neonates of *Apsilochorema* were most abundant in riffles with highest densities of eggs, but they were also present in significant numbers in riffles lacking egg-supply. *Ulmerochorema* spp. were most abundant in riffles with middling densities of eggs. Neonates of both genera were present in the drift and, for *Ulmerochorema*, high rates of drift away from riffles may suggest density-dependent dispersal away from sites with high densities of eggs.

These findings offer new insights into factors limiting the initial densities and distributions of aquatic insects.

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