Population ecology of the marine insect, *Halocladius variabilis* (Diptera: Chironomidae) in the rocky intertidal zone of Nova Scotia, Canada

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ABSTRACT

We studied the population ecology and productivity of the little-known marine insect *Halocladius variabilis* (Chironomidae) from the exposed rocky intertidal zone on the Atlantic coast of Nova Scotia, Canada. Larvae of *H. variabilis* are host-specific symbionts of the brown alga *Elachista fucicola*, which in turn is an abundant epiphyte on the dominant intertidal fucoid, *Ascophyllum nodosum*. At our primary study site at Drum Head, *Ascophyllum* frond density was 546 ± 46 (mean ± SE) fronds m^{-2} for fronds greater than 20 cm long. Density of *Elachista* on *Ascophyllum* was highly variable seasonally, with median densities over 20,000 m^{-2} in July. Mean number of *Halocladius* larvae per *Elachista* thallus varied from 0.8 ± 0.1 in November, to 3.9 ± 0.3 in mid-July. Median density of larvae per frond of *Ascophyllum* ranged from zero in November to 246 in July. The latter figure represents a median density of 59,500 larvae m^{-2}, making *Halocladius* one of the most abundant marine insects known. Based on distributions of larval size, *Halocladius* appears to be univoltine or possibly bivoltine. *Halocladius* larvae were largest (6.48 ± 0.17 mm long) in May and smallest in late August (~2 mm), suggesting a mid-summer period of adult egg-laying. Larval production was conservatively estimated at 130 g m^{-2} y^{-1}, making this also the most productive chironomid known from any habitat. The high population density and production suggest that *H. variabilis* is an important, but overlooked, component of marine rocky shores of the north-western Atlantic.