
Do green tides affect the trophic ecology of juvenile flatfish? Response through the combination of two complementary methods

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Abstract

Coastal zones are some of the most productive and diverse ecosystems in the world and play key roles as nursery grounds for many commercially valuable fish species like sole, plaice, turbot and brill. They are also subject to numerous anthropogenic disturbances, such as excessive nutrient inputs which can cause green tides (GT) that have been shown to modify zoobenthic communities. One can question their effects on higher trophic levels particularly juvenile flatfish which prey on macrobenthic invertebrates. Our study concerned two macrotidal sandy beach systems located in Brittany (Western Europe), one representing the undisturbed site (no-GT) and the other representing the impacted site (GT). Young-of-the-year individuals of flatfish species (*Pegusa lascaris*, *Pleuronectes platessa* and *Scophthalmus maximus*) were sampled at no-GT and GT sites before, during and after the eutrophication event (*i.e.* the algal bloom). Their feeding ecology was studied through gut content analysis (GCA) and stable isotope (carbon and nitrogen) analyses (SIA). The results of GCA showed that young flatfish did not feed on algae but adapted their feeding strategy when the macrobenthic community was modified by green tides. No diet overlap was evidenced whatever the site. SIA results showed a ¹³C enrichment at the GT site. The isotopic niche (given by the Surface Ellipse Areas) of Particulate Organic Matter as primary source, invertebrate prey and of *P. lascaris* or *P. platessa* were reduced in GT compared to those in no-GT sites. Isotopic niche overlaps were only observed at GT site suggesting part of feeding on the same source. These results tend to demonstrate that green tides affected the trophic ecology of young flat fish through modification of the base of the food web.

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