

Are Low Salinity Waters the Remedy to *Noctiluca Scintillans* Blooms in the Arabian Sea?

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Noctiluca scintillans (*Noctiluca*) is a mixotrophic, green dinoflagellate that for the past two decades has been producing problematic algal blooms in the Arabian Sea (AS). As a mixotroph *Noctiluca* obtains energy from both consumption of other phytoplankton as well as from the large populations of photosynthesizing *Pedinomonas noctilucae* that each individual algal cell harbors. It is this autotrophic and heterotrophic dual capability that has largely enabled *Noctiluca* to be a highly competitive and dominant species at the planktonic trophic layer in the AS. With increasing non-point source/point-source pollution in the AS, ocean acidification, and intensified monsoons/upwelling, ocean conditions have become increasingly more favorable for *Noctiluca* and the algal bloom problem has only been exacerbated. For example, in the winter of 2015 the resulting algal bloom was three times the size of Texas. By depleting the AS of oxygen, clogging the gills of fish, and altering the AS food web, these algal blooms result in mass fish die offs. With many countries surrounding the AS dependent on fishery economies, this fish decline propagates financial and food insecurity issues in countless coastal communities. In this study the salinity gradient from the AS around the horn of India into the Bay of Bengal (BB) was replicated in six pairs of culture bottles. Further, *Noctiluca* was grown in six different salinities including 26, 28, 30, 32, 34, and 38 psu. The experiment was carried out over the course of a month and culture bottles were sampled weekly. Algae grown in the 34 and 38 psu bottles were more abundant and contained more chlorophyll, compared to the other salinity treatments. Moreover this study suggests that *Noctiluca* prefers higher salinity waters, and thus fresh water may be the answer to the *Noctiluca* crisis.