

Does symbiosis change sensitivity to pollution? Effects of fluoxetine on *Cassiopea xamachana*

Pharmaceutical contamination is an increasing concern in aquatic environments. Among these emerging pollutants, fluoxetine, a widely prescribed antidepressant, is regularly detected in coastal waters. Although its effects have been investigated in several aquatic organisms, little is known about how photosymbiotic organisms respond to this contaminant and whether the presence of algal symbionts can modify the sensitivity of their host.

The upside-down jellyfish *Cassiopea xamachana* offers a unique model to address this question. During its benthic polyp stage, the animal can be maintained either without algal symbionts (aposymbiotic) or in association with dinoflagellates of the family Symbiodiniaceae. This makes it possible to separately investigate the response of the host, the symbiotic algae and the complete holobiont to the same environmental stressor.



In this project, we will investigate the effects of a gradient of fluoxetine concentrations, ranging from environmentally relevant to higher concentrations, on three biological levels: free-living Symbiodiniaceae, aposymbiotic polyps and symbiotic polyps of *C. xamachana*. The effects of fluoxetine will be assessed through complementary physiological endpoints, including oxidative stress and growth. In polyps, asexual reproduction will also be monitored through budding and, in symbiotic individuals, strobilation. Concentration–response relationships will be used to compare the sensitivity of the isolated partners with that of the complete symbiotic association.

Through this project, you will contribute to understanding whether photosymbiosis can modify the response of marine organisms to chemical pollution and whether the sensitivity of a holobiont can be predicted from that of its individual partners. You will develop skills in cnidarian husbandry, microalgal culture, marine ecotoxicology, cellular ecophysiology and quantitative analysis of concentration–response relationships.



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