

## O46.3

### Are coastal mussels affected by artificial illumination at night?

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#### Abstract

Artificial light at night (ALAN) was developed to facilitate people's life but continuous growth of human population and urbanisation have escalated the dissemination of ALAN. As a result, the worldwide increase of lit areas is about 2.2% annually.

This growth of artificially illuminated areas is of great concern for the conservation of organisms that have adapted evolutionarily to natural light and dark regimes for biological processes and behaviours like feeding, breeding and migration. Research thus far has identified wavelength-dependent effects of ALAN on terrestrial organisms including insects, birds and bats, and some marine species like fish, corals, and zooplankton. Because about 22% of the world's coastlines are exposed to ALAN, it is instrumental to investigate the effects of different ALAN wavelengths on more coastal organisms like bivalves.

Coastal bivalves are globally distributed, provide valuable ecosystem services, and are economically important but they may be impacted by ALAN as they possess photoreceptors, display circadian rhythms and have increased nocturnal activity and feeding.

To test the effect of different ALAN wavelengths on feeding and gaping activity, we designed an experiment exposing mussels to 12h of LED natural light and 12h of green, red and white LED ALAN wavelengths and a control dark treatment. Mussels were equipped with a custom-made system connected to a data-logger used to track the duration mussels spent open and their gaping activity. Additionally, their phytoplankton clearance capacity was recorded, and the results are currently being analysed.

Findings from this experiment can help us understand the extent to which ALAN can impact coastal bivalve populations and associated ecosystem goods and services. They will contribute towards finding the optimal ALAN wavelength that could be used for coastal illumination. This knowledge can feed into both policymaking, regarding lighting strategies, and the aquaculture sector for further optimisation of culturing techniques.

#### Keywords

Artificial Coastal Illumination, Bivalves, *Mytilus Edulis*, Ecosystem services