## The effects of extreme intertidal variation on water retention in molluscs

## <u>Abstract</u>

The ability of marine organisms to retain water is fundamental to their survival in the intertidal zone. Varying sea levels as a result of climate change may put strain on this ability as the time the organisms are submerged in water increases.

The Ria Formosa is a tidal lagoon that is highly susceptible to changes in sea level as a result of climate change. The purpose of this study was to investigate the difference in water retention between *Gibbula umbilicalis* and *Mytilus galloprovincialis,* as well as carrying out an interspecies analysis of water loss when exposed to high levels of immersion and emersion respectively. In the study we measured the percentage of mass lost by both species when they were immersed and kept out of water for different periods of time.

Our predictions were that *Mytilus galloprovincialis* would retain more water than *Gibbula umbilicalis* and that both species would lose more water the longer they had been submerged.

The study showed that *Mytilus galloprovincialis* lost significantly more water than *Gibbula umbilicalis* and that both species lost significantly more water when they were left out for long periods of time. We also found that both species retained significantly more water after 24 hours of submersion in water.

These results indicate that gastropod molluscs could be much more effective at retaining wher than bivalve molluscs. They also indicate that the longer both groups of molluscs spend folly submerged in water the better their water retention becomes. This shows that better their precises of mollusc could be very effective at maintaining water balance in the event clarge scalevels as a result of climate change.

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In a previous study in Roscoff, France, *Gibbula umbilicalis* found at higher shore heights were also found to retain higher levels of water than those found at lower shore height. (Pers obs. Colley et al 2015). To extend on this study, the experiment will compare *Gibbula umbilicalis* and *Mytilus galloprovincialis* to see whether gastropods and bivalves can endure extreme changes in water levels, by testing their ability to retain water in different conditions, such as long exposure and long submersion (simulating the extreme tidal range).

With the phenotypic traits of *Mytilus galloprovincialis* considered and the previous observations of *Gibbula umbilicalis*, we hypothesis that *Mytilus galloprovincialis* will retain more water due to its