

# Report for grant **BFSSG2: Will ocean acidification affect dimethylsulphoniopropionate and dimethylsulphide production in the coastal anemone *Anemonia viridis*?**

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Due to equipment problem, the project was altered so that it could be carried out successfully. The project titled was altered to: **Do rising ocean temperature and feeding regime affect dimethylsulphoniopropionate, dimethylsulphoxide and dimethylsulphide production in the coastal anemone *Anemonia viridis*?**

## **Background**

*Anemonia viridis* is a common ecosystem component in the shallow subtidal and tidepools of Scotland. It captures prey using its stinging tentacles, but also photosynthesizes due to its symbiotic zooxanthellae (*Symbiodinium* spp). *Symbiodinium* spp. are known to be a prolific producers of the dimethylsulphoniopropionate (DMSP), a precursor of the climate relevant trace gas dimethylsulphide (DMS). DMS is the main source of reduced sulphur to the atmosphere and so is an essential link in the global sulphur cycle and is hypothesised to play a major role in the regulation of climate through the formation of clouds. DMSP maybe broken down to DMS which is further oxidised to DMSO as part as a antioxidant cascade in stressful conditions.

## **Incubation carried out**

The Masters student Hayley Bannister successfully performed incubations on *A. viridis* monitoring the effects of temperature and feeding regime on the photosynthetic performance (fluorescence and O<sub>2</sub> production) respiration rates and zooxanthellae characteristics. Rising water temperatures due to climate change may affect the energy balance of the anemone, forcing it to expend more energy to tolerate the warmer waters. Feeding on captured animal prey is also expected to alter their energy balance, leading to less reliance on the photosynthesis of the anemones zooxanthellae.

## **Dataset collected under grant**

To complementary to this, the grant BFSSG2 was used to collect a further dataset to determine the:

- a) DMS, DMSO and DMSP (particulate and dissolved) emission by anemones in the different conditions.
- b) The distribution of DMSO and DMSP between the host anemone and its intracellular zooxanthellae.
- c) Determine the protein content and activity of SOD and catalase with both host and zooxanthellae.

Changes in these parameters may indicate stress created by the temperature and feeding regime. This will also show provide information on how coastal zone sulphur cycling is affected.

## **Status of project**

This dataset has been collected.

DMS was analysed immediately and does not appears to not vary between the different conditions. All other samples have been stored and will be analysed in the coming months.