

## Blog Entry from Alexandra Mystikou

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This is my third visit to the Falkland Islands. This time I am based at SAERI (Stanley) for two months working on taxonomic issues of seaweed species from the Falkland Islands and South Georgia.

In the past our team (Professors Frithjof Kuepper and Pieter van West from the University of Aberdeen, Dr Aldo Asensi from the National Museum of Natural History in Paris, Alexandra Mystikou, who is a joint PhD student between the University of Aberdeen and the South Atlantic Environmental Research Institute, and Melina Marcou from the Dept. of Fisheries and Marine Research, Cyprus) has conducted four expeditions around the Falkland Islands sampling live isolates of macroalgae (seaweeds). Our investigations focus on the molecular taxonomy, ecology and physiology of macroalgae of the Antarctic and Subantarctic regions. During our expeditions we preserve samples of seaweeds for molecular identification, create herbarium specimens and keep cultures of live isolates.

I joined SAERI in October 2012 as a PhD student, co-supervised by Prof. Frithjof Kuepper, Prof. Pieter van West (University of Aberdeen) and Dr Paul Brickle (South Atlantic Environmental Research Institute). My research explores the seaweed biodiversity around the Antarctic Convergence in the South Atlantic and is jointly funded with a scholarship from the University of Aberdeen and the Falkland Islands Government

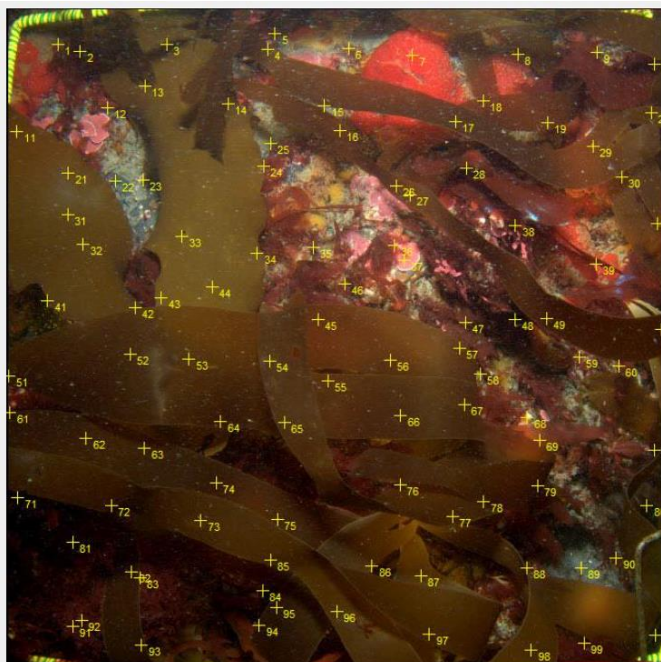
The seaweed biodiversity around the Falklands remains only partially explored. Since the pioneering work of Skottsberg in the early 20th century, few phycologists have visited the islands. More specifically, there are significant gaps in the understanding of the Falklands' deep-water brown algal flora – mainly due to the reason that none of the earlier explorers have dived here.

The two previous expeditions exceeded our expectations as two likely new species of brown epiphytes on the two kelp genus that occur at the Falkland Islands (*Macrocystis* and *Lessonia*) have been discovered. Furthermore, three new records of species that potentially have not been recorded before were made. Another significant finding was the rediscovery of *Cladochroa chnoosporiformis* which had not been seen anywhere in the world for around 100 years.

# SAERI NEWS

Witnessed by many in the Falkland Islands is the “red sand” on various beaches, the cause of which has remained a bit of a mystery. After microscopic observations we hypothesize that this might be due to a mass proliferation of a unicellular red alga (e.g. of the group Porphyridiophyceae). In our explorations, we managed to cover large areas both in East and West Falkland, sampling seaweeds by scuba diving.

In another line of research we explore the ecology of the seaweed communities around the Falkland Islands and South Georgia. In order to identify the seaweed species that form the studied communities we are using PhotoQuad™ software, which is a custom software for advanced image processing of 2D photographic quadrat samples, dedicated to ecological applications (Trygonis & Sini, 2012). The two areas from the Falklands that have been selected are the Jason Islands at the north-western extremity of West Falkland and Beauchêne Island, the southernmost point of the Falkland Islands. These areas have been selected because of their peculiar geographical position, in order to compare the structure of their seaweed communities. The Antarctic Circumpolar Current splits into two main northward streams skirting the Falkland Islands from west and east (Arkhipkin et al., 2013). As a result, there are variations between the productivity and the temperature between the two areas which cause variability between the species composition of the two studied sites.

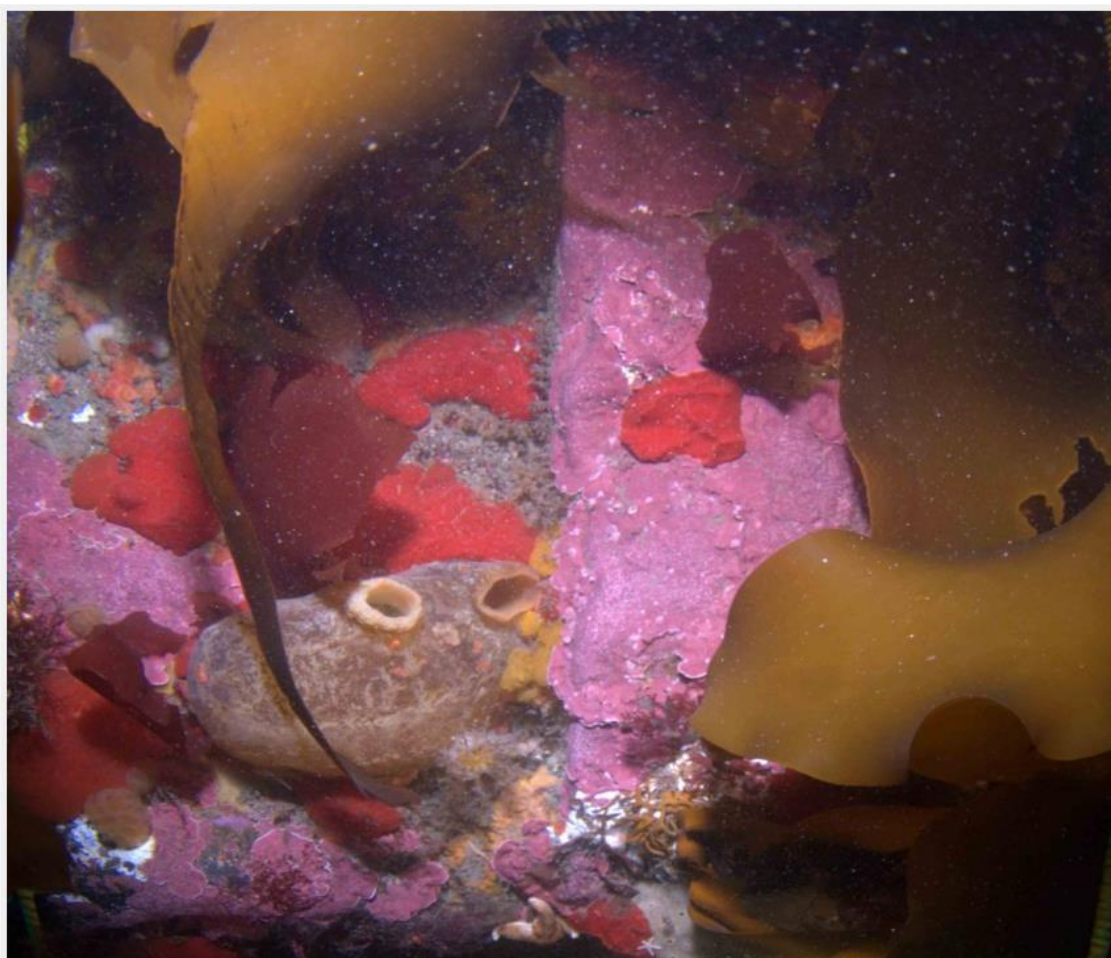


100 random points at PhotoQuad of South Georgian underwater quadrat photo (Photo credit: SMSG)

The structure of a community of species points out the ecological status of an area. We are comparing the number of single species per genus and per family between the three studied areas (Jason Islands, Beauchene Island and South Georgia) where the temperature and the productivity are affected differently by the Antarctic Circumpolar Current. The evolutionary relationships among coexisting species may provide further indicators of the ecology of the habitat. Taxonomic distinctness of a community can be studied by a combination of phylogeny and community structure.

# SAERI NEWS

In the present study we are investigating the phylogenetic structure of the community assemblages by identifying 100 and 200 random points per underwater quadrat image (approximately 300 images per area) and then comparing the genus/species and species /family numbers between the three studied areas. The quadrat photos have been taken at different depths for each area. We are hoping that the outcome from this study will contribute to the knowledge about the ecology of the seaweed habitats of the Falkland Islands and South Georgia and help us understand better the drivers that lead the communities to structure differently.



How many seaweed species can you spot in the picture? (Coraligenous habitat from South Georgia) (Photo credit: SMSG)

Many thanks to the Shallow Marine Surveys Group (SMSG) for collecting and offering kindly to me all the photographic quadrat samples from Jason Islands, Beauchene Island and South Georgia as well as Dr. Paul Brickle and Dr. Paul Brewin for the project (ecology of the seaweed communities around the Falkland Islands and South Georgia) support and guidance. I would like also to thank the South Atlantic Environmental Institute (SAERI) for accommodating and supporting always our research team.