Katie Wilkinson Scholarship Report

The behaviour associated with cleaning stations of Caribbean coral reefs

Eleanor Whittle

A view of Charlotteville, Tobago.

I was lucky enough to be able to accompany a Cardiff University zoology field trip to the village of Charlotteville in Tobago to carry out the fieldwork for my dissertation. I left straight after my exams in June and was incredibly excited (and quite nervous!) about the experience ahead of me.

I spent a total of 2 weeks in Charlotteville taking observations and collecting data. For the first week I joined in with the Cardiff students group projects to allow me to get a firm grasp of fish identification. This worked really well because I got to know everyone, and by the end of he week I was able to instantly identify virtually every species and growth phase of the fish on the reef. I learnt many new skills from both my fellow students and the staff, and I also gave a group presentation on some of our findings.

This first week was also really useful, because prior to arriving in Tobago I had intended to study juvenile french angelfish but when we arrived and started our investigations, I found that there were none of these species on the reef. They had been there in previous years, but obviously certain conditions must have changed and populations had either crashed or migrated away. Due to this, as well as taking part in group projects, I also spent my first week doing some preliminary investigations for my project and discussing with the staff members some alternative projects.

Whilst snorkeling on the different reefs in this first week, a species that attracted my attention was the dusky damselfish, which were vey common on all the reefs. Although they lack the beautiful markings of many of the other reef fish they are very interesting to observe due to their territorial, aggressive behaviour. Despite their small size, they will continuously try to attack individuals and groups of fish that are much larger than themselves until they succeed in making them swim away. This is due to the fact that they occupy and defend permanent territories which contain nest sights or the algae gardens that they feed on. I thought this last point would make them an ideal species to study because if I marked on the reef where each damselfish territory could be found, I could return to it on subsequent days and still observe the behaviour of the same fish.

Dusky Damselfish.

The Cardiff University staff were carrying out research on cleaning stations, which are coral structures that are the home to a species such as the sharknose cleaning gobie. Other species on the reef, such as parrotfish will visit these

cleaning stations in order for the gobie to eat the dead or infected tissue on its body surface. This is thought to be a symbiotic relationship in which the parrotfish (the client) benefits from being cleaned by the gobie, which in turn is provided with a source of food. These cleaning stations are abundant on the reef, and I began to wonder if their presence within a damselfish territory would affect the behaviour of the damselfish. I also wanted to look at the other factors that may make them more aggressive, and whether these are influenced by the presence of a cleaning station within the territory.

I did this by mapping damselfish territories both with and without the cleaning stations within them, and marked their locations on the reef with small sandbags and plastic bottles. At all the different territories, I carried out several 10 minute observations and recorded the species of intruder and its growth phase (e.g. juvenile, intermediate, adult etc.) and whether or not it was attacked by the damselfish. I also recorded the number of intruders of each species (i.e. solitary or group of 14), the size of the each damselfish territory that was observed, and the time of day for each 10 minute observation.

My results indicated that the presence of a cleaning station in a damselfish territory does not increase their aggression. However, aggression is dependent on the species of the intruder, which is likely to be related to the diet types of the intruders, for example, herbivores have an 85% likelihood of being attacked by the damsel due to the fact that they feed on the algae that the damselfish defend. The aggression of the damselfish also increases by over 50% from the morning to the evening, which may be due to the increasing temperatures.

I learnt so many invaluable skills whilst out in Tobago, and I have fantastic memories that I will never forget. I was able to gain so much experience in sampling techniques and field ecology and I also learnt a lot from the Cardiff staff as well as the other students, especially since they were experienced in different skills from me. We were also lucky enough to be able to attend talks from people such as the President of Environment Tobago who was incredibly inspirational, and members of Coral Cay who spoke about reef sampling an their work in

Tobago. We were also incredibly fortunate as we witnessed a turtle laying her eggs on the beach, which was unforgettable.

I met a fantastic group of people and it was amazing to be able to visit a part of the world I have never seen before, as well as being able to carry out a project that encompasses so many aspects of my interests and passions. I am incredibly grateful to The Katie Wilkinson Research Scholarship for allowing me to carry out my research in the Caribbean, which I would not have been able to do without the grant.

Booby Reef, where my data was collected

The Cardiff Students