

Pollution as a result of human activities damages ecosystems around the Globe. Oil pollution more specifically causes detrimental effects upon communities due to its high toxicity. Yet, we still only have a limited understanding of how it affects exposed organisms. For my Masters by Research project, I was looking into how oil pollution in Trinidad is affecting a common freshwater guppy, *Poecilia reticulata*. The Trinidadian guppy is a particularly interesting study organism as it is able to adapt to extreme environmental conditions, and is one of the few fish species that tolerates extensive pollution. Trinidad is home to the largest site of natural oil pollution in the World, the so-called Pitch lake, as well as numerous waterbodies that are subject to anthropogenic oil pollution. In both kinds of habitats, the Trinidadian guppy remains seemingly unaffected, and populations are able to thrive. Therefore, my masters project aimed to investigate the guppy's phenotypic divergence in body shape and life histories caused by oil pollution, with the aim to make significant contributions to our understanding of how animals adapt to extreme environments.

For my project, guppies were sampled across Trinidad in 2018, from 6 anthropogenic oil-polluted waters, and 5 unpolluted sites as the control. These were then brought to Royal Holloway by PhD student Francesco Santi, and thus I began carrying out a morphological and physiological analysis for my project. 367 guppies were photographed and subsequently uploaded to computer software to quantify their body-shape variation. Life-history dissections were then carried out on the guppies, in order to uncover their phenotypic responses to oil pollution. Furthermore, I investigated whether there were unique population-specific responses. The work which I conducted during my master's project allowed me to investigate a topic of great personal interest, which coincides with a significant yet understudied field in ecology. Although I gained many independent research skills during my year, something was missing: unfortunately, the Royal Holloway schedule meant I could not partake in the necessary field work, as my masters started in September which is outside the guppy main reproductive season, when sampling would take place. Fieldwork is crucial for students who wish to follow a research path, as it allows them to come face-to-face with the subject being studied. Through this, students are able to obtain a greater understanding of their study system, develop sampling techniques, and it also renders students more enthusiastic about their studies. Therefore, I applied to the Royal Holloway and Santander travel award to assist Francesco with his PhD project in Trinidad, in collaboration with the University of the West Indies, where I could gain important field work experience and broaden my knowledge of the guppy study system. The purpose of Francesco's research trip was to determine whether female guppies had a sexual preference for males from polluted or unpolluted habitats. Although his research question differed to that of my master's project, it nonetheless provided me with an invaluable field work experience. During my time in Trinidad, I assisted Francesco in preparing the laboratory equipment for his project. This included cleaning the fish tanks that we would keep the guppies in, ensuring all was safe for them. Once everything was ready for their arrival, we headed out to the field and used seine nets and dip nets to collect guppies from the same sample sites that were visited in 2018, comprising of 6 oil-polluted habitats and 5 unpolluted habitats. We tried to collect even numbers of males and females, and these were then transported to the laboratory. Once back in the lab, we placed guppies from different habitats in separate tanks, and began behavioural experiments. For this, we placed one male guppy in a small fish tank, with females from differing habitats in separate tanks,

either side of the male. The amount of time the male spent at each side determined which female he was more attracted to, and thus whether he preferred females from polluted or unpolluted habitats. While I was busy with observational experiments, Francesco was carrying out capture tests on the guppies, which I was also able to learn about. These tests would determine the guppy's ability to evade predators, again, seeing whether this would differ based on the guppy's habitat type.

Francesco was in Trinidad for four weeks running experiments, and I was able to help for just over two weeks, after which I came back to the UK. My time assisting Francesco meant that he was able to carry out more experiments than if he were alone, and I also gained many important field-work skills. I thoroughly enjoyed my time in Trinidad, and would like to thank the Royal Holloway Travel award, as well as Amy Deacon at the University of the West Indies, and Francesco Santi, for helping to make this possible.

