Ecological speciation in a Japanese three-spined stickleback species pair

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Left: Pacific (upper) and Japan Sea (lower) anadromous three-spined sticklebacks, freshly caught in Hokkaido. Right: Eating a Japanese meal in a traditional restaurant close to the NIG.

I was honoured to receive a JSPS Short-term postdoctoral fellowship for six months to work in collaboration with Dr Jun Kitano at the National Institute of Genetics in Mishima, Shizuoka. During my time in Japan, I focused on testing whether divergent natural selection is driving reproductive isolation between the Pacific and Japan Sea forms of the three-spined stickleback in the waters surrounding Hokkaido.

Although a small and unassuming fish species, the stickleback has become an evolutionary supermodel over the last decade and is a major focus of speciation research across the world. The Japanese stickleback system is unique within the wider distribution of the species as the two forms produce sterile hybrids when interbreeding. Jun Kitano's laboratory focuses on assessing the ecological, behavioural, physiological and genomic factors that have led to the evolution of reproductive isolation.

My work focused largely on the role of natural selection in this instance of stickleback speciation. To do so, I conducted fieldwork in Hokkaido to collect sticklebacks from several sites and used stable isotope analysis to assess dietary divergence. In addition, I set up an experimental assay to test whether foraging behaviour differed between the species. The results we have generated during this short time are exciting and suggest that ecologically mediated selection does play a role in maintaining divergence between the species. We are hoping to produce several publications in the near future and I am sure my connection with the laboratory will result in fruitful research collaborations in the future.

Research aside, my time in Japan is something I will always treasure. I have had the opportunity to meet many wonderful, friendly people both at work and outside. I have managed to travel quite extensively and see many of the fascinating cultural practices and beautiful landscapes that the country holds. I would highly recommend the JSPS short-term fellowship to other researchers in the UK and Europe. My main suggestion for anyone embarking on a research visit here is to learn a few words of the language and to teach yourself hiragana and katakana (not as daunting as that might seem). Just a smattering of the language can get you a long way and the already warm and friendly people become more so when you make the effort.

It is a testament to how much I enjoyed my time in the Kitano laboratory and Japan that I have applied for a full postdoctoral fellowship from the JSPS. If successful, I hope to move towards understanding the genomics and evolutionary history of speciation in this interesting study system. That and further exploring Japan!