ECR SPOTLIGHT

ECR Spotlight – Pedro Duarte

ECR Spotlight is a series of interviews with early-career authors from a selection of papers published in Journal of Experimental Biology and aims to promote not only the diversity of early-career researchers (ECRs) working in experimental biology but also the huge variety of animals and physiological systems that are essential for the ‘comparative’ approach. Pedro Duarte is an author on ‘Tracking lipid synthesis using $^{2}$H$_{2}$O and $^{2}$H-NMR spectroscopy in black soldier fly (Hermetia illucens) larvae fed with macroalgae’, published in JEB. Pedro is a PhD student in the lab of Ivan Viegas at the University of Coimbra, Portugal, investigating edible insect metabolism and nutritional value, and their role in the bioconversion of organic waste and improving food security.

How did you become interested in biology?
I feel like I was always curious about the natural world, science in general and rural life, despite living in a city. I enjoyed being outside and interacting with all kinds of animals, especially the smaller ones, but it was only in my last year of school that I realized that I wanted a career in biology. I was already very aware of taxonomic bias and zoophobia among my colleagues back then, so it was pretty clear that I wanted to study entomology.

Describe your scientific journey and your current research focus
When I entered university, I was very interested in spider research, and I actually did an internship focused on spider identification. I quickly realized that taxonomy was not for me, unfortunately, but I still wanted to study terrestrial arthropods in general. I then searched for entomologists near my area, and that’s when I met my current co-supervisor, Dr Olga Ameixa, who was conducting a study on fatty acid trophic markers in wild insects. That work defined my shift from classical taxonomy to insect biochemistry. Eventually, we had a bigger project, aimed at studying fatty acids in the context of insects as feed for fish. Thus, I decided to pursue a PhD in black soldier fly metabolism, to go beyond classical nutritional profiles, and provide a deeper understanding on the physiology of this edible insect.

How would you explain the main findings of your paper to a member of the public?
In this paper, we establish a method to measure the production of fats (=lipids) in black soldier fly larvae. One of the reasons black soldier flies are used for animal feed production is that the larvae accumulate considerable lipid reserves prior to metamorphosis, and we are interested to know if those lipids are sourced from the larval diet directly or produced by the insect from other nutrients, such as sugars. Moreover, as a proof of concept, we wanted to see if this process was impacted by changing the diet of the larvae, and if we were able to quantify that change.

Why did you choose JEB to publish your paper?
I mostly followed the advice of my supervisor, Dr Ivan Viegas, who had previously published in JEB. I was convinced that in JEB my work would have the proper visibility and share in the good reputation of the journal itself. This method is actually the cornerstone of the following work I have planned and was developed for me and hopefully others to use, so I wanted it to be a trustworthy, peer-reviewed, open access paper. Also, JEB allows methods papers, and uses an [Author, date] citation style, which I prefer.

What is your favourite animal, and why?
I have too many options to choose from, but today I will pick the bee flies (Family Bombyliidae). While much has been done to promote bee awareness, not many people are actually conscious of the incredible biodiversity of wild insects, and pollinators in particular, which have a huge role in food safety and ecosystem function. The bee flies are flies that look like bees, and some are very fuzzy and cute looking. They are Batesian mimics, which means they resemble a dangerous animal for protection against predators but are actually harmless in the adult stage. I strongly believe they could be a flagship for unpopular, unrecognized insects, pollinators in particular.

Do you have a top tip for others just starting out at your career stage?
Although I don’t feel confident advising other PhD students, I always recommend to my younger colleagues trying to publish
their first paper as soon as they can. I say this because publishing takes time, and publications are a major requirement to apply for grants or positions. I have seen many master’s students that do remarkable original research work but postpone article writing. After delivering their thesis, some end up working on something else, giving up on a scientific career prematurely, which may be a loss to all of us.

Reference

Egg laying in black soldier flies. Black soldier flies don’t lay their eggs directly in the food source, where they could be vulnerable to other predators and to mould, which quickly colonizes dead matter. Instead, they find small cracks nearby to hide them in. In captivity, two wood planks tied with a rubber band provide the perfect environment.