

## **ESAI Postgraduate of the Year 2022 – Elena Zioga, Trinity College Dublin**

Elena Zioga is a PhD candidate at Trinity College Dublin, funded by the Department of Agriculture, Food, and the Marine. Her supervisors are Professors Jane Stout and Blánaid White, based in School of Natural Sciences in Trinity College Dublin and School of Chemical Sciences in Dublin City University respectively. Elena is originally from Ioannina (Greece), graduated with a BSc in Agriculture and has a MSc in Biodiversity Conservation, both from Aristotle University of Thessaloniki, Greece. Her PhD research aims to address key gaps in the current knowledge of pesticide residues in pollen and nectar and assess whether their presence poses a hazard for bees.

Pesticides applied in agriculture, enter the soil, and may be translocated throughout plant tissues, contaminating nectar and pollen of both crops and non-target wildflowers. Pollen and nectar are the main food source for bee pollinators, constituting this oral exposure of concern for bee health and for the sustainable delivery of pollination services, which consequently may have significant implications for ecosystem function, crop production, and human health. To address gaps in the current knowledge of pesticide contamination levels of pollen and nectar and assess whether their presence poses a hazard for bees, Elena's research involved sampling a minimum of 1000 flowers from two crop and one wild hedgerow species, along with bee collected pollen, from multiple farm sites over Ireland. For her research, she also validated analytical methods for the extraction of the most applied pesticides in Irish agriculture. Her findings provide evidence of widespread pesticide contaminations of pollen and nectar, at levels that could potentially pose a hazard for bee pollinators. Mixtures of some persistent compounds were frequently detected, long after they were applied, implying a continued exposure risk. Overall, the findings of her work have implications for public policy and pesticide management practices both within and beyond Ireland.

These findings are disseminated through scientific journal articles, popular science media, and direct communication with appropriate stakeholders. Elena has published her research in peer-reviewed journals such as the Science of the Total Environment, Heliyon and Environmental Research, and has presented the findings of her work at numerous national and international conferences, where she received multiple prizes. Being very active in the science communication and engagement world, Elena's work was widely disseminated through popular national newspapers (e.g., see <https://www.irishtimes.com/environment/2023/01/18/commonly-used-weedkiller-glyphosate-could-pose-threat-to-bees-irish-scientists-find/> and <https://www.independent.ie/news/environment/contamination-fears-for-bees-and-their-honey-after-weedkiller-chemical-is-found-in-irish-wildflowers-42291528.html>) and online media (e.g., see <https://youtu.be/huyOyGMYdCs>).