A Botany Field Course exploring the biodiversity of Tenerife, funded by the Santander Travel Fund

With £500 each from the Santander Travel Fund, Maisie Vollans and I were able to fund and attend a 6-day field course on Tenerife, the largest of the Canary Islands. Accompanied some of Oxford University’s best botany professors, we travelled all over the island, exploring the huge diversity of plants and habitats across the oceanic island, from the arid scrub of the coastal Badlands to the temperate laurel forests in the north of the island. Alongside this we were given an intensive course in the basics of botanical fieldwork and saw first hand how modern biotechnology such as tissue culturing is helping to maintain Tenerife’s banana industry in an increasingly competitive market and an ever-changing climate.

At the face of it, Tenerife seems an unlikely choice for a botany field course – it is synonymous with beach holidays, large resorts and, most of all, for being hot and dry. Despite this image and its relatively small size however, Tenerife is a hotspot for diversity, hosting nearly 1500 plant species and the largest number of endemic species in Europe. This is mostly due to its relief and topography.

The imposing peak Teide, formed from the collision of three shield volcanoes, rises 3700m above sea level, and altitudinal variation in conditions allow a broad range of habitats, including temperate woodland, pine forests and sub-alpine scrub, to establish on its slopes. The mountain also creates a sharp divide in rainfall between the north of the island, with receives wet northeast tradewinds, and the south, which experiences a much drier current. These combining factors lead to a broad range microclimates and habitats, each with their own diverse range of flora are adapted to their setting, and make the oceanic island a fascinating place not only for botany, but also for biogeography and for studying evolutionary processes such as adaptation.

The course began with a crash-course in botany, helping us get to grips with the seemingly overwhelming diversity of forms and structures of the native plants on the island. With the aid of our highly knowledgeable tutors, we progressed within a few days from complete bewilderment to being able to classify species with a scientific key and even recognize some of the major plant families.

With this knowledge under our belts we visited each of Tenerife’s diverse and bountiful ecosystems to study how plants are adapted for each environment. In the dry scrubland we saw how genera such as the Euphorbia were adapted for the arid soils with their many water storage structures; in the pine forests we found the endemic pine Pinus canariensis, which
has thick spongy bark to help it survive the periodical forest fires that pass through in drier years; even up in the rocky caldera around the imposing Teide volcano, we saw the few species of Fabaceae and *Echium* that were so well adapted to survive plummeting temperatures and nutrient poor soils, rising far above the breathtaking “Sea of Clouds” (formed from condensation of tradewinds on the northern slopes) and up towards the peak itself.

While exploring the current diversity of the island was as exciting as it was educational, it was also important to understand the dynamism of Tenerife’s biogeographical and evolutionary history, and how the two have interacted to produce the stunning plethora of life seen today. At the University of La Laguna, we received a talk on Tenerife’s important role as a refuge for relic temperature forests that once stretched across Europe, and how such relics are important for studying evolutionary history on wider scales. In the field we saw first hand how island chains allow species to radiate and fill a broad range of different niches, exemplifying adaptation – had Darwin been able to in Tenerife rather than progressing to the Galapagos, we would be talking of “Darwin’s Lizards” not finches. All of this built upon our pre-existing knowledge from the last two years of the course: it is one thing to study evolution and adaptation from lecture slides back in Oxford, but seeing the processes and examples we’d heard about in person was a different experience entirely, and one that helped put it all into context.

When we weren’t stumbling around the scrub with our hand lenses, we set our sights on how man has shaped the island, focusing in particular on Tenerife’s ever-growing banana industry. We visited a banana plantation and learned how farming practices have helped increase yields and provide the 6000l of water needed to produce each bunch of bananas. We also visited the labs of Cultesa, a company that provides 90% of Canary Island’s farmers with new banana plants. The company was leading the way with tissue culturing, growing banana cuttings in aseptic conditions to prevent infection with viral or bacterial diseases (normally passed from parent to offspring in the plantations) and providing farmers with young plants from a broad range of different sources, helping to increase the genetic diversity of their crop. In a world with increasingly unpredictable weather patterns and, especially on Tenerife, ever drier soils, maintenance of genetic diversity will be vital as a source of new stress tolerant genes and to ensure the industry’s stability in the decades to come.
Both of us enjoyed the trip and found it immensely informative. The staggering diversity of Tenerife’s native (and often endemic) flora, found across such small distances, inspires great appreciation and awe of the plant kingdom that it is difficult to experience from within the four walls of a lecture theatre, and both of us feel so lucky to have had the opportunity to get out there. For me the course was especially fascinating, and has sparked an interest in botany that I hope to continue in education beyond my undergraduate degree. The Santander Travel Fund covered almost all of the costs of the field course, making this amazing trip possible, and for this we are very grateful. Thank you!