Wine lovers are helping to map biodiversity in Portugal's Douro Valley

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SPECIAL TO THE GLOBE AND MAIL

PUBLISHED JULY 18, 2023

UPDATED JULY 20, 2023

This article was published more than 1 year ago. Some information may no longer be current.

Participants on citizen science tours come away with a deeper understanding of the role nature plays in wine production.

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Anyone who appreciates wine will know that terroir is critical. The valley's shallow

The grapes grown in Portugal's Douro Valley depend so much on the area's unique ecosystem that a large segment of these varietals can't be cultivated anywhere else on Earth. In fact, the Douro Valley is the world's oldest wine region and in 2001 was listed as a UNESCO World Heritage Site.

The Douro River and its tributaries are lifelines for local grape growers. Levadas, the small aqueducts that run through and along the region's mountains, carry water to farmers. The Douro itself was at one time the only way for winemakers to transport their product from the Valley to Porto, where it could be sold and shipped to buyers.

Grapes continue to be harvested by hand on terraces too steep for machine work and stomped by foot in wood or granite vats. But alongside these traditional winemaking practices, solar panels are being installed at quintas, the farms that produce Portuguese wine, and organic growing practices adopted as vintners grow increasingly concerned with sustainability and the environmental impact of their work.

This is where the art of winemaking intersects with the science of biodiversity, and why travel company Exodus has partnered with NatureMetrics, a DNA-based monitoring company, to equip tour groups with water-testing kits designed to collect eDNA samples at destinations like Douro. By harnessing the power of tourism, they hope to address the data gap in biodiversity measurement.

"Until now, biodiversity data collection has been largely based on traditional field monitoring techniques – imagine the trained biologist out in the forest doing point counts for birds or looking for mammal scat or tracks," says Dr. Natalie Swan, NatureMetrics' business development manager in conservation. "Consequently the resulting data has been hugely biased toward the bits of biodiversity we can see, particularly birds and mammals – but biodiversity is so much more."

Traditional biodiversity measurement is very localized and requires a lot of time, effort and resources to conduct. Because of this, it is nearly impossible to collect data from across the entire globe. Now, wine-connoisseurs-turned-citizen-scientists can help.

"eDNA is a game-changer in this context," says Swan. "Both for species coverage and scalability. In one water sample we can collect the fingerprint of an entire ecosystem – data from across the tree of life, and we don't need a specialist to collect it."

Winemakers in Portugal's Douro Valley, the word's oldest wine region, are marrying traditional techniques with climate-friendly growing practices.

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The kits can be used by everyone from tourists to school children out on a field trip. Exodus and NatureMetrics are incorporating water testing into their Citizen Science departures, like the Walking and Wine itinerary, which takes travellers to the Douro Valley to hike among the vines at Quinta Do Tedo and Quinta das Escomoeiras. The latter, which sits high over the Tamega River, a tributary of the Douro, produces an exceptional organic vinho verde, the region's second-most famous wine (port is the first). Following a hike, guests share a bottle and gaze out over the valley while sitting among the vines that produced the wine they're enjoying.

It's a lesson in the ways that the local wine industry and wine tourism depend heavily on the health of the environment around it. A love of wine engenders a love

for the beautiful place that produces it and contributing to the eBioAtlas project is one way visitors can make a meaningful contribution to the region.

"The system that NatureMetrics has developed to collect eDNA is exciting because it brings complicated science down to a simple level," says Exodus' head of sustainability, Rochelle Turner. "We believe we have a responsibility to help ensure that nature and wildlife is protected and we want our adventures to give back far more than they take. The more people in more places collecting this data, the better and stronger the database of species will be."

Travellers who participate are sent findings from their samples about eight weeks after their trip and the data is shared with the International Union for Conservation of Nature's eBioAtlas project, which supports biodiversity across the globe. On a recent trip to the region, travellers collected samples that showed the presence of 15 different species that also depend on the river, including the red fox, the Eurasian otter and the northern straight-mouth nose fish, which is classified as vulnerable on the International Union for Conservation of Nature's Red List.

"In the face of the biodiversity crisis we need to rapidly fill the gaps in our knowledge of species across the globe, so we know where we are starting from, so we can identify priority areas and allocate conservation resources, and importantly, to track our progress," says Swan.

Travellers often return home from a visit to a grape-growing region with souvenir bottles of their favourite wines. Here, they also return home with a deeper connection to the Douro Valley and the health of its ecosystem, as well as a better understanding of how to protect the place they've fallen in love with.

Learn more about the Portugal: Walking and Wine Premium Adventure trip at exodustravels.com.

The writer was a guest of Exodus Travels. The company did not review or approve this article prior to publication.