

EcoVitis

Maximizing ecosystem services in Douro Demarcated Region vineyards

Newsletter

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C.Carlos/ADVID

A very important area of woodland remnants is present at Quinta das Carvalhas.



F.Gonçalves/UTAD

Mortuary at Quinta de S. Luiz.

Introduction to the project

The 'Douro Demarcated Region' (DDR) is the oldest regulated winemaking region in the world. It covers an area of approximately 250,000 ha, of which some 45,000 ha are planted with vines. Its most representative part (about 10% of the total area) is the 'Alto Douro Wine Region' or just the 'Alto Douro' and is a UNESCO World Heritage Site owing to its unique character as an 'evolved continuing cultural landscape'. Unlike other wine growing areas in the world, the Alto Douro landscape offers great biodiversity, because it includes a significant area of non-crop habitats (e.g. woodland remnants, grassy slopes, or terraces with natural vegetation and dry stone walls). About 20% of the vine-growing area is scrub, of which one quarter consists of terraces that were abandoned after the devastation of phylloxera in the late 19th century, called "mortuaries". These former vineyards are now overrun with wild flora, whose importance for the conservation of a wide range of biota in agricultural landscapes is known. However, agricultural intensification, as practiced over centuries in the region, has led to habitat destruction as well as fragmentation of remaining habitat, with negative effects on the occurrence of species and thus on biodiversity.



C.Carlos/ ADVID

Ladybirds are common in Alto Douro vineyards



C.Carlos/ ADVID

Lacewings have a important role in the biological control of grapevine pests



F.Gonçalves/ UTAD

Hoverflies are frequently found feeding on flowers from the family Asteraceae

The EcoVitis project, "Maximizing ecosystem services in Douro Demarcated Region vineyards" is a collaboration of the University of Trás-os-Montes and Alto Douro (UTAD), the Association for the Development of Viticulture in the Douro Region (ADVID) and two participating port wine companies. To preserve and enhance the landscape of the Alto Douro calls for a management model that combines the production of port wine, an economically viable product with strong historic and symbolic significance, and the conservation of biodiversity and ecological services (e.g., biological control of pests, diseases and weeds; maintenance of soil fertility; clean air and water; shelter and food for locally rare birds, reptiles and insects; aesthetic values of the area and the unique nature of the region for marketing purposes).

A grower/technician/researcher partnership was developed over many years and in 2011 'EcoVitis' was born in a partnership of Companhia Geral da Agricultura das Vinhas do Alto Douro, S.A. (Real Companhia Velha – RCV), Sogevinus Quintas S.A. (SGV), Association for the Development of Viticulture in the Douro Region (ADVID) and the University of Trás-os-Montes and Alto Douro (UTAD). Financial support for the project was obtained from January 2011 to December 2014, via a government and EU funded program, namely Program for the Rural Development (PRODER), Action 4.1 Cooperation for Innovation.

EcoVitis represents a step along the way to encourage sustainable farming practices in Alto Douro vineyards, by demonstrating the benefits of linking product quality and environmental quality. In one example, the project is demonstrating that the costs of biodiversity conservation may be compensated by the enhancement of conservation biological control of main pests, with the potential to reduce chemical applications, contributing to both increased economic and environmental sustainability of the wine industry. It is expected that the economic efforts of maintaining aesthetic qualities of the landscape will be compensated by the creation of other activities, such as ecotourism and wine tourism. In addition it is expected that this project will contribute by providing growers with tools to promote products employing environmentally friendly and sustainable practices, and by helping consumers to identify and distinguish them.

The research activities of the project will focus on six study farms, but results will be extended to the whole of the Alto Douro Region, by numerous outreach and extension activities, and dissemination of results.

New approaches for management of European Grapevine Moth, in Alto Douro vineyards

The European Grapevine Moth, *Lobesia botrana* (Denis & Schiffermüller) (Lepidoptera: Tortricidae) is a key-pest of vineyards in Alto Douro, infesting up to 50% of grapes at harvest. Within EcoVitis we are examining innovative plant protection techniques to reduce pest damage with minimal environmental impact, by two main approaches: an enhanced role of natural antagonists, and pheromone-based mating disruption. We aim to improve results using each technique, as well as integrate them into one workable strategy.

The possibility of manipulating the ecological infrastructure of local farms to improve conservation biological control, and to preserve biodiversity, has been under study since 2002. We hypothesize that we can enhance biological control by arthropod enemies and by native entomopathogenic fungi that occur in untreated refugia. To date, seven species of Hymenopteran parasitoids have been identified: the most common are *Elachertus affinis* (Masi), *Brachymeria* sp., *Campoplex capitator* (Aubert) and *Dibrachys cavus* (Förster); also several species of entomopathogenic fungi, mainly from the genera *Beauveria* and *Metarhizium* are being isolated. Rates of parasitism of *L. botrana* of up to 46.9% can occur in local vineyards.

Mating disruption has been tested since 2000 using ISONET dispensers (Shin-Etsu Chemical, Japan) increasing from an initial 9 ha to 214 ha in 2012. Results have been very promising, but infestation often remains above the tolerance threshold, owing primarily to the high biotic potential of *L. botrana*, its extended life cycle, and the mix of vineyards and untreated habitats common in the Alto Douro region. Currently, we are testing an improved dispenser design.

We also plan to develop spatial analysis methods and geographic information systems for improved pest management and to measure biodiversity at the landscape level, relevant to mixed landscapes on highly variable and steep slope terrain.



In Alto Douro vineyards several organisms acts as regulating factors of European Grapevine Moth populations: A - larva parasitized by *Elachertus affinis*; B - larva infected with *Beauveria bassiana*.

Contacts

Professor Laura Torres
Centre for the Research and Technology of
Agro-Environmental and Biological Sciences
University of Trás-os-Montes and Alto Douro (CITAB/UTAD)
Quinta de Prados, PO Box 1013
5001 801 Vila Real
Ph: + 351 259 35 05 42
Fax: + 351 259 35 04 80
Email: ltorres@utad.pt

Cristina Carlos
Association for the Development of Viticulture in the
Douro Region (ADVID)
Quinta de Santa Maria, PO Box 137
5050 -106 Godim
Ph: +351 254 31 29 40
Fax: +351 254 32 13 50
Email: cristina.carlos@advid.pt

Rui Soares
Companhia Geral da Agricultura das Vinhas do Alto
Douro, S.A. (RCV)
R. Azevedo Magalhães, n.º 314 Oliveira do Douro, 4430-
022 Vila Nova de Gaia,
Mobile: +351 96 580 20 38
Fax: +351 254 73 80 51
Email: ruisoares@realcompanhiavelha.pt

José Manso
Sogevinus Quintas S.A. (SGV)
Avenida Diogo Leite 344
Santa Marinha
4400-111 Vila Nova de Gaia
Ph: +351 223 75 19 39
Fax: +351 223 74 66 99
Email: jose.manso@sogevinus.com

Participating properties

Quinta das Carvalhas (RCV)
Quinta de Cidrô (RCV)
Quinta de S. Luíz (SGV)
Quinta do Arnozelo (SGV)
Quinta do Casal da Granja (RCV)
Quinta dos Aciprestes (RCV)

Weblinks

[http://europa.eu/legislation_summaries/agriculture/
general_framework/l60032_pt.htm](http://europa.eu/legislation_summaries/agriculture/general_framework/l60032_pt.htm)
<http://www.advid.pt/>
<http://www.citab.utad.pt/>
<http://www.realcompanhiavelha.pt/>
<http://www.sogevinus.com/>
<http://www.utad.pt/>



Scorzonera hispanica, a rare iberian plant found in the Alto Douro



Native vegetation, such as *Rosa pouzinii* Tratt., provides shelter and food (nectar and pollen) for natural enemies of pests

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