

■ Meet-a-Member: Javier Martínez-Abaigar

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DOI: [10.19232/uv4pb.2018.2.22](https://doi.org/10.19232/uv4pb.2018.2.22) © 2018 The Author, licensed under (CC BY-SA 3.0) 



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Why did you choose to work on plant UV-effects? Since I was developing my PhD, I was abducted by mountain streams and plants inhabiting them, particularly bryophytes. This was due to two main reasons: the extremely dynamic nature of moun-

tain streams, permanently changing (as the Greek philosopher Heraclitus already said in the 5th century BC), and the magic and tiny bryophyte universe under the microscope, plenty of diminutive and fascinating structures. After some years studying the limiting environmental factors for bryophyte life in such harsh ecosystems as mountain streams, we realized that solar radiation, and specifically UV, was surely key to understand the whole story. In Spain, stream bryophytes can live at even 2,000 m altitude, where summer UV levels are really high, and they frequently turn brown or black under these conditions. Surprisingly, they become bright green again from late autumn onwards. This apparent resurrection stimulated us to study the eco-physiological mechanisms underlying the apparent UV tolerance of bryophytes. We were lucky because, at that time, we could contact several very collaborative groups of physicists who introduced us to the basic concepts and instrumentation of this exciting world. After all, solar radiation is the force driving life on the planet and studying how it happens is addictive.

What is your research-specialisation?

Now we are especially interested in two topics:

1. The effects of UV on bryophytes, an evolutionarily important plant lineage because they were the first “true” plants colonizing land from their algal aquatic ancestors, facing new challenges to plant life in the terrestrial environment, such

as high UV and low water availability.

2. Applied management aspects of UV which could allow us to influence the quality of grapes and wine, and the metabolite composition of mushrooms. (do not forget that grapevine is the most emblematic crop in my region, and mushrooms are also of strong commercial importance).

Nevertheless, we are always open to new topics and collaborations, particularly those including innovative ideas, underexplored approaches and collaborative projects.

Of which UV-related accomplishment are you most proud, and why? During the last years we are trying to understand to which extent molecular events related to UV are relevant under field conditions, applying also an evolutionary perspective. In 2018 we have published two papers that try to clear a path in this way. In the first one (Soriano et al., *New Phytologist* 217:151), carried out in collaboration with Prof. Gareth Jenkins, we have demonstrated that the action mechanism of the UV-B photoreceptor UVR8 is very old in evolution, being mostly common from bryophytes to higher plants. In the second one (Monforte et al., *Functional Ecology* 32:882), we propose that the two main bryophyte lineages (liverworts and mosses) use different accumulation strategies of UV-absorbing compounds to cope with UV radiation, which could have been important in the ecological segregation of both groups upon land colonization.

Apart from this, I am particularly proud of the collaborative experiments (and papers!) I have participated in, such as those developed within the Grapevine Ultraviolet Network.

Although I am happy with all these achievements, I hope that better things are still to come.

Can you tell a funny story relating to your work on UV-effects? We have a few of them.

Recently, we designed a frame with UV lamps and assembled it on a tractor to irradiate grapes and analyze potential beneficial effects of supplemental UV on grapes quality. To ensure that every bunch received an adequate and homogeneous irradiation dose, the speed of the tractor had to be very low. The first lamp frame prototype we constructed finished its days crashed against a grapevine plant because the tractor was running so slowly that the driver fell asleep at the wheel. Fortunately, driver, tractor and plant uninjured.

Have you got any hints, tips or other advice to share? In the UV research context, it is crucial to be aware of the basic concepts and technical aspects, such as how to use lamps, filters and UV measurement instruments, and how to apply action spectra, calculation of UV doses, etc. A superb (and freely downloadable!) bibliographic source is available to learn everything about all these aspects and more: Aphalo et al. 2012, *Beyond the visible: A handbook of best practice in plant UV photobiology* (published under the auspice of COST Action FA0906, led by Prof. Marcel Jansen). This book should be the Bible for every UV researcher, both beginners and seniors, to avoid mistakes in the design and execution of experiments. In addition, to obtain good quality and adequately replicated results, and to use appropriate controls, are decisive aspects to build good and reliable UV science.

What made you join UV4Plants? It was an easy decision for me. I had previously been a participant in the COST Action FA0906 UV4Growth (UV-B radiation: a specific regulator of plant growth and food quality in a changing climate), where I found a UV community of scientists ready to share their science and friendship with everybody, something not easy to find in the scientific community. UV4Plants is the second part of UV4Growth and, in this case, second parts



Figure 5.1: Javier Martínez-Abaigar during his PhD, crossing the river Iregua (La Rioja) in spring, carrying pH-meter and other equipment.

are really good. If you need anything related to UV (technical advice, plant material, laboratories to develop short stays, support to young researchers, partners to apply for a project...) you will always find some kind guys in UV4Plants trying to solve your queries. Thus, I had no doubt to join this society and to recommend all my students to do so.

How would you like UV4Plants to develop in the future?

UV4Plants is a solid scientific society with deep and strong roots, a web woven through many fruitful personal and scientific relationships. In some aspects, we are like a family, where the success of one is the success of everyone. Though, we can still improve. I think one of our challenges nowadays is to increase membership and thus critical mass, particularly from outside Europe (although not forgetting European countries where we currently have no or little presence). In addition, we surely can contribute more to the development of applied

aspects of UV research which can be positive for the general society and/or the environment: functional foods, alternatives to chemical pesticides, etc. Innovative and collaborative research traditionally supported by UV4Plants should be greatly and continuously encouraged, particularly to help young researchers and researchers from developing countries.

Who would you like to appear in a future “Meet-a-Member”?

Lars-Olof Björn, an eminent UV scholar from the very first steps of UV science and the first Honorary Member of UV4Plants. He combines the characteristics I have always admired in a scientist: professional expertise, humbleness, good mood and humour, and a collaborative attitude to help other people. All of us can learn a lot from his experience.

Editorial-board-reviewed article.

Published on-line on 2018-12-27.

Edited by: Pedro J. Aphalo.

