

■ Participants' report

Experience from 17th Congress of the European Society for Photobiology (ESP): sharing knowledge and insights

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Our research group, led by Pedro J. Aphalo, has long been studying light as a regulatory signal that guides plants' growth and development: on morphological, physiological and molecular levels. Corresponding experiments have been performed either in the field with natural light or in controlled environments with artificial light. In both cases, we attempt to maintain as realistic light conditions as we can for the plants. Since, in the natural environment, prolonged exposure to UV radiation is often followed by drought stress, our research interests also include assessing the interaction between the responses regulated by these two environmental factors. We use a varied variety of plant species ranging from model species such as *Arabidopsis thaliana* and *Medicago truncatula* to horticultural species such as *Vicia faba*, *Pisum sativum*, *Solanum lycopersicum* and *Lactuca sativa*. In the past experiments, we have also used boreal tree species *Betula pendula* and *Betula pubescens*. High throughput Next-generation sequencing have been recently used to identify whole range of transcriptional response regulated by UV and drought. Therefore, the congress of the European Society for Photobiology was really a must-go for our group.

The congress of the European Society for

Photobiology covered all aspects of photobiology at different levels of organization. It is an essential forum to promote new research and technological breakthroughs in photobiology. The congress also offers great opportunities for researchers to have effective discussions, exchange insights and establish new collaborations. The meetings are organized every two years, the latest 17th congress being held in Pisa in early autumn (4th–8th September) of 2017. It was still warm then in this part of Italy, which gave us an opportunity to enjoy the beautiful Tuscany city, in addition to participating in the congress (Figure 7.1).

The conference was huge, in total 30 symposia and 8 keynote lectures, with several parallel sessions. These included a symposium focusing on the recent advances of UV research in plants and organised jointly by ESP and UV4Plants and a Satellite meeting on 'Turning photobiology into commercial reality: exploiting UV radiation for sustainable and innovative food', both jointly organised by UV4Plants and ESP.

Among the presentations in the symposium we found the presentation: "UV-B radiation as a regulator of photosynthesis in *Arabidopsis thaliana*" especially interesting. This research was presented by Rixta Siev-



Figure 7.1: The authors on the *Ponte di Mezzo* over the River Arno in Pisa. From left to right, Neha, Yan and Sari. Photo: Martina Barilari.

ers who is studying for her PhD with Jason Wargent at Massey University in New Zealand. Many studies using unrealistic high UV-B radiation in controlled environment have suggested that high levels of UV-B radiation can lead to deleterious effects on plants: e.g. a reduction in photosynthetic capacity. However, the presenter had found that at realistically moderate levels, UV-B exposure can stimulate an increase in net photosynthesis by regulating a number of genes involved in chloroplast import. This suggests that UV-B might serve as a positive environmental regulator in sunlight that and artificial supplementation when it is absent could enhance food production.

Three PhD students from our research group were able to participate this congress with funding from the fellowship of European Society for Photobiology (Yan Yan) and travel grant from Doctoral Program in

Plant Science in University of Helsinki (Neha Rai and Sari Siipola). Each of us had a poster presentation in interactive poster sessions during the congress. Yan presented her result from an outdoor experiment with two accessions of *Vicia faba* under four different optical filter treatments. Data from morphological measurements and analyses of secondary metabolites indicate that the two accessions used in the experiment, from Sweden and Ecuador, responded differently to solar UV and blue radiation. Neha presented her work from an outdoor experiment assessing leaf metabolic profile of two *Medicago truncatula* cultivars exposed to solar UV radiation and drought stress. Results showed that different groups of flavonoid compounds and their derivatives identified in the leaves of *Medicago truncatula* depend on the cultivar and that there was an interaction between solar UV and drought



Figure 7.2: The conference dinner provided to ESRs opportunities for informal discussions among them and with experienced researchers. Chats on subjects related to their thesis work and future career development can lead to opportunities for collaboration and/or future employment.

stress. Sari presented her results from an outdoor experiment with *Arabidopsis thaliana*. The data from the experiment showed that accumulation of flavonoids, both in the wild type and several photoreceptor mutants, can be detected already after 6 hours of exposure to natural sunlight and that both cryptochromes and UVR8 are involved in this accumulation. Also, concentrations of aglycones and sugars vary at different time points.

We had lively discussions in the poster sessions and dinner (Figure 7.2). Some of the conversations provided us new perspectives to interpret our results. The congress also offered a chance to meet our collaborators: Dr. Andreas Albert and Dr. Barbro J. Winkler from Helmholtz Zentrum in Munich, Melanie Wiesner and Susanne Baldermann from Leibniz-Institute of Vegetable and Ornamental Crops in Berlin. We utilized this

opportunity to discuss experiments done in collaboration with the two German institutes and possible future collaborations.

We also attended a few sessions which were not specific to plant photobiology, but were however interesting to us. One such session was about benefit and hazard of sunlight exposure to human skin. The different fields of research presented in the congress widened our knowledge and educated us about recent scientific developments in photobiology as a whole, which will benefit our scientific career in the long run.

We enjoyed the participation in this four-day congress: the joy of sharing scientific knowledge, making new connections and last but not least the beautiful late-summer weather in Pisa.

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