

NEWSLETTER

Editorial



Photo Anett Hofmann

Since 2010, the Zurich-Basel Plant Science Center has been pioneering PhD education at the Plant Science & Policy interface. The ProDoc PhD program has raised awareness among our members of the policy dimensions in new research proposals. It has improved our understanding of the role of scientists in the public dialogue – a learning process we share with our PhD students. It has allowed us to bring PhD students into direct contact with a diverse network of policy-makers and professionals.

The PSC is proud to provide PhD students with the competences they need on their way to becoming independent researchers and professionals. In 2012, we can again look forward to exciting workshops and public events at the interface of plant science and the policy decision-making process. Beyond 2012, the PSC will continue its efforts to anchor the program in both national and other networks, thereby helping PhD students, post-doctoral fellows and professionals to establish a voice at the interface of plant sciences and policy.

Dr. Melanie Paschke – PSC Managing Director – Education

Upcoming events

PLANT FELLOWS Kick-Off Meeting,
21 March 2012, *uniTurm, University of Zurich*

PhD Workshop "Building Political Support", 18 April & 30 May 2012,
Botanical Garden, Zurich

Fascination of Plants-Day 2012,
18 May 2012

Trends and Advances in Plant Biology,
PSC Special Symposium, Friday 19 October 2012, Zurich

Plants replacing fossil fuels, PSC PhD Symposium, 8 November 2012, ETHZ, Audimax

2012/21

Zurich – Basel
Plant Science Center



University of Zurich^{UZH}



ETH

Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

Awards

- **Ueli Grossniklaus** has been elected member of the Deutsche Akademie der Naturforscher Leopoldina.
- **Florian Schiestl** received a 2011 ERC Starting Independent Researcher Grant for his project “FLORSIGNALS – Evolution and consequences of floral signaling in plants”.
- **Ansgar Kahmen** received a 2011 ERC Starting Independent Researcher Grant for his project “COSIWAX – Compound Specific Hydrogen Isotope Analyses of Leaf Wax-n-Alkanes as a Novel Tool to Assess Plant and Ecosystem Water Relations Across new Spatial and Temporal Scales”.
- The Cassava Research Team of the Plant Biotechnology Lab of ETH Zurich led by **Hervé Vanderschuren** won the SFIAR Award 2011 for the project “Cassava research – technology transfer and capacity building: Making tropical crop technologies available where it can have an impact” (Wilhelm Gruissem group).
- The following three young researchers received the 2011 PSC Symposium Poster Award: **Aurélien Bailly** (1st prize), Institute of Plant Biology, Department of Microbiology UZH (Laure Weisshaupt group); **Frank Liebisch** (2nd prize), Institute of Agricultural Sciences, ETHZ (Achim Walter group); **Christian Andres** (3rd prize), Research Institute of Organic Farming FiBL, Frick, Switzerland (collaboration with Emmanuel Frossard group).
- **Bettina Gutbrodt** received the prestigious Vontobel Prize for her outstanding PhD thesis in basic agricultural sciences (Silvia Dorn group).
- **Michael Raissig** and **Heike Lindner** won an award for the best poster at the Retreat of University Priority Programs in Systems Biology / Functional Genomics (Ueli Grossniklaus group).
- **Claudio Sedivy** received the Royal Entomological Society award for his excellent oral presentation at the RES Ento’11 Conference in September 2011 (Silvia Dorn group).

Two PSC–Syngenta Fellowships awarded

- “Temporal analysis of the regulatory activities of small RNAs during the cell-to-cell spread of tobacovirus infection” (Manfred Heinlein, Franck Vazquez, Thomas Boller).
- “Characterization of the purine permease (PUP) family of genes in *Arabidopsis* as candidates for a cytokinin transport system controlling signaling activities and domains” (Bruno Müller, Enrico Martinoia, Ueli Grossniklaus).

For project description and open positions, see [PSC website](#)

New flagship for postdoctoral training to set sail

In March, the PSC is launching a unique international postdoc fellowship program in plant sciences – called PLANT FELLOWS. After a very competitive review process, the European Union gave the PSC the go-ahead to launch a training and mentoring program especially dedicated to postdoctoral fellows. The PLANT FELLOWS training program includes transnational mobility, industrial placements, career events, workshops and courses dedicated to training in entrepreneurship and complementary skills. Unique in its kind, the program offers fellows the chance to obtain a Certificate in Plant Research and Development. PLANT FELLOWS will be managed by the PSC. A website will provide information about application and selection procedures, host organizations and other program activities.

PLANT FELLOWS is open to applicants from all over the world. Beside the three PSC partner universities, 11 European universities, 7 other universities and research institutes and 3 industry partners were predefined as host organizations on the basis of their excellence in higher education and plant research. Three calls for application will be published: in June and Oct 2012, and in Feb 2013. The proposal submission deadline is 3 months after the publication of the call. A 3-month evaluation process will follow. Each grantee is expected to start his/her fellowship within 6 months of notification.

To learn more about the program, please join us for the PLANT FELLOWS Kick-off Meeting on 21 March 2012 or visit www.plantfellows.ch.

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& Dr. Melanie Paschke, paschkme@ethz.ch



"I am very excited about the PLANT FELLOWS initiative of the PSC, as it will allow networking between postdoctoral fellows and their host institutions at an international level. From the point of view of the participating institutions, I expect that advertising and recruitment through the PLANT FELLOWS program will provide access to highly competitive postdoctoral candidates at the top level. In addition, I expect that participation in the PLANT FELLOWS program will lead to the initiation of new collaborations between the participating institutions. More importantly, though, are the postdoctoral fellows. They constitute a segment of academic research that is of utmost importance, but is the least organized and mentored at the institutional level. MSc and PhD students form cohorts in well established programs that facilitate networking, training, and mentoring. Postdoctoral fellows do not currently benefit from such well-organized structures, yet they would benefit most from good preparatory training for the job market, from international contacts, mentoring, and networking activities. Such activities are even more important in a field such as plant sciences, which is often only represented by a small number of research groups in a department or a faculty. I am convinced that the PLANT FELLOWS program will become an international flagship for plant sciences and greatly benefit the postdoctoral fellows in planning their careers and being successful on the job market."

Prof. Ueli Grossniklaus, former president of the Zurich-Basel Plant Science Center and chair of the PLANT FELLOWS program

EDUCATION

PhD Program in Plant Sciences, Spring 2012

- Science 2.0: Online Collaboration, Publishing, Communicating and Creating a Web Presence, 16–17 Feb
- GDC Platform Training, 20 Feb & 5 March
- Scientific Writing Practice II, 24 Feb & 23 March
- Plant Sciences & Policy: Evidence-based Policy Making, 1 March & 11 April
- Research with Biological Material from Abroad – International Regulations and Good Research Practice, 20–21 March
- Responsible Conduct in Research for Plant Scientists, 2 March & 4 April
- Introductory Course to R, 28–30 March
- Plant Sciences & Policy: Building Political Support, 18 April & 30 May
- Scientific Presentation Practice, 20 April & 4 May
- Patenting in Life Sciences, 11–12 June
- SPSW and SystemsX.ch Summer School: Modeling Development in Plant Sciences, 21–23 June
- Ecology of Alpine Plants, 16–20 July
- Next-Generation Sequencing and Genome Assembly, date tba
- Dealing with Publication Process, date tba

For more course details and dates:

www.plantsciences.ch/education/graduate_study/courses_ps/spring_2012

Plant Science & Policy

Upcoming PhD Workshop "Building Political Support", 18 April & 30 May 2012

Research plays a vital role in policymaking, and the entry points through which scientists can make an impact on public policy are manifold. In this course, key aspects of the policymaking process in Switzerland are explained, and its main actors are introduced. Using the practical example of the CO₂ bill, we discuss the essential steps in the process of policy endorsement in Switzerland. Drawing upon the gene technology moratorium and the Swiss Biodiversity Strategy, the facts, values and procedures which are important for dealing with policy-makers and politicians are highlighted in a collaborative workshop and in group work based on case studies. The second day of the workshop includes a visit to the Swiss Parliament and to the Swiss Biodiversity Forum. The course is open to all PSC PhD students.

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Additional Plant Science & Policy Event

Workshop "Evidence-Based Policy Making", 1 March & 4 April 2012

Plant Science & Policy PhD Symposium. Our ProDoc and Mercator fellows will present and discuss their projects. Keynote speakers will be invited.

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Plant Science & High Schools

Plant Science & High Schools aims to strengthen the link between academic plant research and high school teachers in Switzerland. The program supports them in their work to awaken fascination for plant sciences in their students and highlights the potential of plants and the direct links they have with people's lives.

We invite high school teachers to join us for various one-day workshops on campus in Zurich and Geneva. At these events, we present cutting edge research in a very hands-on way. Teachers carry out low-tech experiments that they can conduct at school. For the scientists who participate, the program offers a great opportunity to present their research field and to discuss it with a highly motivated audience.

So far, two workshops on Modern Plant Ecophysiology and on Green Biotechnology have been launched in Zurich. A course on Modern Plant Phylogeny and Evolution is being prepared. For a list of upcoming courses for teachers, visit: www.plantsciences.ch/education/mittelschule/index. All scientists are welcome to contribute ideas for additional workshops. Harald Rauter develops the courses based on scientists' suggestions.

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SCIENCE HIGHLIGHTS

Nature 477:199–203 (2011)

High plant diversity is needed to maintain ecosystem services

Isbell F, Calcagno V, Hector A, Connolly J, Harpole WS, Reich PB, Scherer-Lorenzen M, Schmid B, Tilman D, van Ruijven J, Weigelt A, Wilsey BJ, Zavaleta ES, Loreau M

Biodiversity is rapidly declining worldwide, and there is consensus that this can decrease ecosystem functioning and services. Nevertheless, it remains unclear whether few or many of the species in an ecosystem are needed to sustain the provisioning of ecosystem services. It has been hypothesized that most species would promote ecosystem services if many times, places, functions and environmental changes were considered; however, no previous study has considered all of these factors together. Here, we show that 84% of the 147 grassland plant species studied in 17 biodiversity experiments promoted ecosystem functioning at least once. Different species promoted ecosystem functioning during different years, at different places, for different functions and under different environmental change scenarios. Furthermore, the species needed to provide one function during multiple years were not the same as those needed to provide multiple functions within one year. Our results indicate that even more species will be needed to maintain ecosystem functioning and services than previously suggested by studies that have either (1) considered only the number of species needed to promote one function under one set of environmental conditions, or (2) separately considered the importance of biodiversity for providing ecosystem functioning across multiple years, places, functions or environmental change scenarios. Therefore, although species may appear functionally redundant when one function is considered under one set of environmental conditions, many species are needed to maintain multiple functions at multiple times and places in a changing world.

Science 333:1750–1753 (2011)

Productivity is a poor predictor of plant species richness

Adler PB, Seabloom EW, Borer ET, Hillebrand H, Hautier Y, Hector A, Harpole WS, O'Halloran LR, Grace JB, Anderson TM, Bakker JD, Biederman LA, Brown CS, Buckley YM, Calabrese LB, Chu CJ, Cleland EE, Collins SL, Cottingham KL, Crawley MJ, Damschen EI, Davies KF, DeCrappeo NM, Fay PA, Firn J, Frater P, Gasarch EI, Gruner DS, Hagenah N, Ris Lambers JH, Humphries H, Jin JL, Kay AD, Kirkman KP, Klein JA, Knops JMH, La Pierre KJ, Lambrinos JG, Li W, MacDougall AS, McCulley RL, Melbourne BA, Mitchell CE, Moore JL, Morgan JW, Mortensen B, Orrock JL, Prober SM, Pyke DA, Risch AC, Schuetz M, Smith MD, Stevens CJ, Sullivan LL, Wang G, Wragg PD, Wright JP, Yang LH

For more than 30 years, the relationship between net primary productivity and species richness has generated intense debate in ecology about the processes regulating local diversity. The original view, which is still widely accepted, holds that the relationship is hump-shaped, with richness first rising and then declining with increasing productivity. Although recent meta-analyses questioned the generality of hump-shaped patterns, these syntheses have been criticized for failing to account for methodological differences among studies. We addressed such concerns by conducting standardized sampling in 48 herbaceous-dominated plant communities on five continents. We found no clear relationship between productivity and fine-scale (meters⁻²) richness within sites, within regions, or across the globe. Ecologists should focus on fresh, mechanistic approaches to understanding the multivariate links between productivity and richness.

Ecology Letters 14:1001–1009 (2011)

Belowground biodiversity effects of plant symbionts support above-ground productivity

Wagg C, Jansa J, Schmid B, van der Heijden MGA

Genome Research 21:2157–2166 (2011)

The making of a new pathogen: Insights from comparative population genomics of the domesticated wheat pathogen *Mycosphaerella graminicola* and its wild sister species

Stukenbrock EH, Bataillon T, Dutheil JY, Hansen TT, Li R, Zala M, McDonald BA, Wang J, Schierup MH

PSC website
www.plantsciences.ch

PSC MEMBER



Photo A. Kahmen

Prof. Ansgar Kahmen: new PSC member

Plants are fundamental components of the earth system. Their ability to assimilate atmospheric CO₂ into organic compounds drives the biogeochemical cycles

in ecosystems, determining the provision of ecosystem goods and services that we, as human beings, depend on. Understanding how plants respond to global environmental change and how this impacts the composition and function of ecosystems are thus important questions in ecological-, plant-, and environmental-sciences.

In the new Physiological Plant Ecology Group at ETH Zurich, we address the interface between plants and their environment and investigate the physiological responses of plants to environmental change. The goal of our research is to understand how changes in plant physiological performance affect the composition and function of ecosystems in a changing environment. Our research thereby links plant ecophysiology to plant population dynamics and ecosystem biogeochemistry.

A central question that we have focused on in recent years is the physiological response of plants to drought. We have addressed this question at various spatial scales, ranging from experiments in climate-controlled growth chambers to ecosystem-level manipulations using rainout shelters and landscape-level observations. Our research has shown that the growth of plants is typically negatively affected by drought and that plants allocate more biomass below ground when water is becoming scarce. An important discovery of this research has been that the effect of drought on plants became less severe when plants grew in ecosystems with high plant diversity. We are now expanding our investigations and are addressing how the subtle but long-term environmental changes that have occurred since the onset of the industrial revolution have affected the physiological performance of plants over the past 150 years. For this purpose, we use stable isotope ratios of carbon, oxygen and hydrogen recorded in tree rings or leaf wax n-alkanes as indicators of plant physiological performance of the past. This research will allow us to understand if plants acclimate physiologically over time to environmental changes, as has recently been suggested, and will help to predict how the composition and function of real world ecosystems will respond to anticipated environmental changes in the future with increased accuracy.

Curriculum vitae

Ansgar Kahmen studied biology at the University of Vienna. From 2001 to 2004, he was as a PhD student at the Max Planck Institute for Biogeochemistry in Jena, where he investigated the effects of plant diversity on biogeochemical cycles in grasslands. After PostDoc work at ETH Zurich and the University of Melbourne, he spent four years at the University of California at Berkeley, where he developed a model to employ stable oxygen isotopes as proxy for plant water relations. In 2011, Ansgar Kahmen received a starting grant from the European Research Council and was appointed Assistant Professor for Physiological Plant Ecology at ETH Zurich.

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2012/21



Photo A. Gilgen

Rain-out shelters simulating drought in the field



Photo A. Kahmen

Controlled drought experiments in climate chambers

NEWS



Fascination of Plants Day – 18 May 2012

Plants are fascinating, interesting, exciting organisms – I guess we all agree on that. But what about researchers in other disciplines, the public, or decision makers in policy and politics? Do they know about the enormous importance of plants and plant sciences in our lives? Quite rightly, plant researchers often complain about a widespread lack of awareness and acknowledgement of plant science among many stakeholders. “Often they don’t take us seriously or they emphasize that other research is much more fancy,” a plant scientist recently told me. Let us prove our critics wrong! I cordially invite you to join Fascination of Plants Day 2012 (FoPD12), an initiative of EPSO, the European Plant Science Organisation, see www.plantday12.eu.

FoPD12 is meant to be more than a casual one-day event. FoPD12 wants to reach as many people as possible, aiming to give them an enduring appreciation of plants and plant science. To date, dozens of institutions in 30 countries have pledged support for the initiative by opening their labs, organizing competitions, holding public discussions on plant sciences, writing blogs, combining plant science and art, and much more. Find an overview of events and dates on www.plantday12.eu.

In Switzerland, several botanical gardens and research stations, as well as the Genetic Diversity Center at ETH, will contribute to FoPD12: see www.spsw.ch/plantday12. They are either organizing their own events, or they are taking part in one of the events set up by the Swiss Plant Science Web (SPSW): “Plants and Emotions” and “Medicinal Plants – a Traveling Exhibition”.

What is fascinating about plants? “Plants and Emotions” is a collection of children’s drawings exhibited alongside photographs taken by plant scientists, which will be shown in several botanical gardens. The traveling exhibition on medicinal plants will be part of BOTANICA – botanical gardens week – in June 2012. This exhibition represents the link between the audience of BOTANICA and current plant research in Switzerland. You are cordially invited to join one of these initiatives or to organize your own event.

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PSC Special Symposium, Friday 19 October 2012

Trends and Advances in Plant Biology

Following the annual meeting of the editorial board of the Annual Review of Plant Biology, in Zurich, the PSC will organize a special symposium to discuss some of the current trends and advances in plant biology with members of the ARPB editorial board and the PSC community. Speakers include: Jeffrey Benetzen, University of Georgia, USA; Winslow R. Briggs, Carnegie Institution of Washington, USA; Dean DellaPenna, Michigan State University, USA; Wilhelm Gruissem, ETH Zurich, Switzerland; Maria J. Harrison, Cornell University, USA; Sabeeha S. Merchant, University of California Los Angeles, USA; Donald R. Ort, University of Illinois, USA; Qifa Zhang, Huazhong Agricultural University, China.

Impressum

Plant Science Newsletter, no. 21/Spring 2012
Publisher: Zurich–Basel Plant Science Center, Coordination Office PSC, Universitätstrasse 2, ETH Zurich, LFW, 8092 Zurich, Switzerland. Phone: +41 (0)44 632 23 33; info@plantscience@ethz.ch, www.plantsciences.ch

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Production
English language consultant:
Penelope Barnett, Masterkingen ZH
Design concept: Arturo La Vecchia, Zurich
Layout: Esther Schreier, Basel
Printing: Print Media Works GmbH, Schopfheim
Print run: 500 copies
Paper RecyMago 135 g/m²
Pictures: Sylvia Martinez
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