



# 15<sup>th</sup> World Congress on Parasitic Plants

June 30 – July 5 2019,  
Amsterdam, The Netherlands



Sponsors 15<sup>th</sup> World Congress on Parasitic Plants,  
30 June – 5 July 2019, Amsterdam, the  
Netherlands



UNIVERSITY OF AMSTERDAM



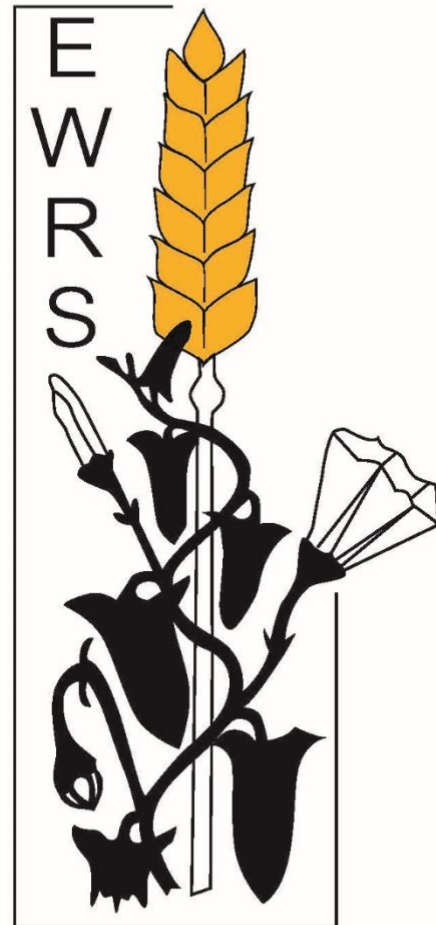
RESEARCH  
PROGRAM ON  
Grain Legumes and  
Dryland Cereals



The Federation  
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## SCHEDULE OF ORAL PRESENTATIONS

### SUNDAY, JUNE 30

- 16.00 - 20.00 Registration open  
18.00 - 21.00 Welcome mixer with snacks sponsored by Trends in Plant Science | Cell Press

### MONDAY, JULY 1

- 09.00 - 09.20 Welcome by Julie Scholes and Harro Bouwmeester
- 09.20 – 12.40 Host plant resistance**  
Session chair: *Steve Runo*
- 09.20 – 09.55 The parasite *Cuscuta australis* with a streamlined genome mediates inter-plant systemic signals  
*Jianqiang Wu*
- 09.55 – 10.30 *Cuscuta* microRNAs target host mRNAs involved in defence and vascular function  
*Michael Axtell*
- 10.30 – 11.00 Coffee break
- 11.00 – 11.25 Interspecific long-distance movement of *Cuscuta* small RNAs control biological processes in host-parasitic plant complex  
*Koh Aoki*
- 11.25 – 11.50 A peptide motif of a parasitic plant cell wall protein is recognized by the receptor protein CuRe1 and induces defence in tomato  
*Markus Albert*
- 11.50 – 12.15 Molecular basis for tomato resistance to the parasitic plant *Cuscuta*  
*Neelima Sinha*
- 12.15 – 12.40 Characterization of resistance to sunflower broomrape (*Orobanche cumana* W.) in sunflower (*Helianthus annuus* L.)  
*Dana Sisou*
- 12.40 – 12.50 International consortium on sunflower broomrape resistance  
*Stephane Munos & Begoña Pérez-Vich*
- 12.50 – 14.15 Lunch
- 14.15 – 18.00 Ecology, phylogeny and evolution**  
Session chair: *Claude DePamphilis*
- 14.15 – 14.50 Eco-evolutionary causes and consequences of parasitism in plants  
*Susan Wicke*
- 14.50 – 15.25 Novel genetic code and record-setting AT-richness in the highly reduced plastid genome of the holoparasitic plant *Balanophora*  
*Claude dePamphilis*
- 15.25 - 15.50 A neglected alliance in battles against parasitic plants: AM and rhizobial symbioses alleviate damage to a legume host by root hemiparasitic *Pedicularis* species  
*Airong Li*
- 15.50 – 16.20 Coffee break
- 16.20 – 16.45 When the same is not the same  
*Peter Toth*
- 16.45 – 17.10 Genetic diversity of *Orobanche cumana* (sunflower broomrape) populations at the world level revealed by SSR markers  
*Luyang Hu*
- 17.10 - 17.35 Facultative parasitism: an evolutionary precursor of complete parasitism or an effective strategy in its own right?  
*Lammert Bastiaans*
- 17.35 – 18.00 Fitness of reciprocal F1 hybrids between *Rhinanthus minor* and *R. major*  
*Renate Wesselingh*
- 18.00 - 19.30 Poster viewing with drinks
- 19.30 - 21.00 Dinner
- 21.00 – Bar conference centre open

### TUESDAY, JULY 2

- 09.00 – 12.45 Genes and genomes**  
Session chair: *Jim Westwood*
- 09.00 – 09.35 *Cuscuta campestris*: A plant genome under the influence of a parasitic lifestyle  
*Kirsten Krause*
- 09.35 – 10.10 Genetic basis for host and parasitic plant communication



Satoko Yoshida

- 10.10 – 10.35 Exploring the evolutionary origin of haustorium development in root parasitic plants  
*Daniel Steele*
- 10.35 – 11.05 Coffee break
- 11.05 – 11.30 Where the action is: gene expression at the parasite-host interface  
*Elizabeth Kelly*
- 11.30 – 11.55 Convergent horizontal gene transfer and crosstalk of mobile nucleic acids in parasitic plants  
*Claude dePamphilis*
- 11.55 – 12.20 The identification of candidate pathogenicity-related genes from the genome of *Striga hermonthica*  
*James Bradley*
- 12.20 – 12.45 Lack of evidence for horizontally transferred genes in mitochondria of *Cuscuta* species  
*Benjamin Anderson*
- 12.45 - 14.15 Lunch
- 14.15 – 18.10 Molecules and Biochemistry**  
Session chair: David Nelson
- 14.15 – 14.50 CHEMICALS that control *Striga* germination  
*Tadao Asami*
- 14.50 – 15.25 Signalling pathways in *Striga hermonthica* germination  
*Shelley Lumba*
- 15.25 - 15.50 Complementary hormone-based approaches for *Striga* Control  
*Salim Al-Babili*
- 15.50 – 16.20 coffee break
- 16.20 – 16.55 Unravel strigolactone signaling and controlling parasitic plant behaviors in *Striga*  
*Yuichiro Tsuchiya*
- 16.55 – 17.20 Structural and biochemical characterization of strigolactone parasitic receptors, understanding their functionality and how to inhibit them  
*Amir Arellano Saab*
- 17.20 - 17.45 Identification and characterization of  $\alpha$ -galactosidase capable of hydrolyzing planteose in *Orobancha minor* as a target for control of root parasitic weeds  
*Atsushi Okazawa*
- 17.45 – 18.10 Cannalactone: a new non-canonical strigolactone exuded by *Cannabis sativa* roots with a pivotal role in host specialization within French broomrape (*Phelipanche ramosa*) populations  
Jean-Bernard Pouvreau
- 18.10 - 19.30 Poster viewing with drinks
- 19.30 - 21.00 Dinner
- 21.00 – Bar conference centre open
- 09.00 – 12.45 Control and Management**  
Session chair: Maurizio Vurro
- WENDNESDAY, JULY 3**
- 09.00 – 09.35 *Striga* research on finger millet: protocols, GWAS and RNA sequencing  
*Damaris Odeny*
- 09.35 – 10.10 Parasitic weed management - opportunities and challenges  
*Hanan Eizenberg*
- 10.10 – 10.35 Advances in parasitic weed control in the field  
*Binne Zwanenburg*
- 10.35 – 11.05 Coffee break
- 11.05 – 11.30 Correctly multi-targeted Host-Induced Gene Silencing (HIGS) should allow full and sustainable control of parasitic weeds  
*Jonathan Gressel*
- 11.30 – 11.55 Realizing the suicidal germination strategy to control *Striga hermonthica* in rain-fed agriculture of sub-Saharan Africa  
*Boubacar Kountche*
- 11.55 – 12.20 How do fertilisers affect the facultative parasitic weed *Rhamphicarpa fistulosa* ?  
*Jonne Rodenburg*
- 12.20 – 12.45 Development of chickpea (*Cicer arietinum* L.) mutant resistant to imidazolinone herbicides for broomrape management  
*Evgenia Dor*
- 12.45 - 13.45 Lunch
- 14.00 - 23.00 Conference tour + Conference dinner



## THURSDAY JULY 4

### 09.00 – 12.45 **Parasitic plant biology**

Session chair: *Airong Li*

- 09.00 – 09.35 Understanding the arms race: host resistance and parasite virulence in the *Striga*-cereal interaction  
*Julie Scholes*
- 09.35 – 10.10 Native parasitic plants: a solution of plant invasions worldwide?  
*Jakub Tesitel*
- 10.10 – 10.35 Transcriptomics to farmer field: a system biology approach for commercializing root parasitic *Santalum album* (Sandalwood)  
*Pradeepa Bandaranayake*
- 10.35 – 11.05 Coffee break
- 11.05 – 11.30 Reproductive biology and pollination of *Cynomorium songaricum* (Cynomoriaceae)  
*Gullin Chen*
- 11.30 – 11.55 *Triphysaria* controls vegetative self-recognition by restricting release of HIFs in roots  
*Yaxin Wang*
- 11.55 – 12.20 Analysis of genetic variation in pre and post attachment resistance mechanisms in maize inbred lines to the parasitic weed *Striga hermonthica* ; implications for control  
*Mamadou Cissoko*
- 12.20 – 12.45 Impact of the soil microbiome on *Striga*-sorghum interaction  
*Desalegn Etalo*
- 12.45 - 14.15 Lunch

### 14.15 – 18.00 **Parasitic plant-host interaction**

Session chair: *John Yoder*

- 14.15 – 14.50 War and peace – the molecular dynamics of compatible and incompatible *Striga*-host plant associations  
*Mike Timko*
- 14.50 – 15.25 What model plants can tell us about parasitic plants  
*Thomas Spallek*
- 15.25 - 15.50 Message received: Evidence for translation of mobile mRNAs in *Cuscuta*-host interactions  
*James Westwood*
- 15.50 – 16.20 Coffee break
- 16.20 – 16.45 The roles and functions of lignin in parasitic plant-host interaction  
*Songkui Cui*
- 16.45 – 17.10 A receptor and pathways discovered in the lignin-based resistance to *Cuscuta campestris* in Heinz hybrid tomato cultivars  
*Min-Yao Jhu*
- 17.10 - 17.35 Cytokinins act as signaling molecules within the rhizosphere to trigger haustorium formation in the holoparasitic plant *Phelipanche ramosa*  
*Estelle Billard*
- 17.35 – 18.00 Striking vegetative developmental convergence in endoparasitic angiosperms  
*Luiza Teixeira-Costa*
- 18.00 - 19.30 Poster viewing with drinks
- 19.30 - 21.00 Dinner
- 21.00 – Bar conference centre open

Departure participants



## [P9] Breeding strategies for *Orobanche cumana* resistance in sunflower

Sandra Cvejić, Siniša Jocić, Milan Jocković, Boško Dedić, Sreten Terzić, Ivana Imerovski, Aleksandra Radanović, Vladimir Miklič and Dragana Miladinović

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Broomrape (*Orobanche cumana* Wallr.) is one of the most important constraints on sunflower production in Europe and Asia. It produces a large number of small seeds that are easily disseminated, leading to the build-up of *O. cumana* populations, and the constant appearance of new, and more virulent races. Current racial situation of broomrape in the main infested areas is unclear, since there is a lack of information on whether races under the same name reported in different countries are the same or differ in terms of virulence. Among the several control options proposed, breeding for resistance have been found to be most effective and environmental friendly way. Since *O. cumana* resistance is broken frequently, multiple sources of resistance are needed to control the emerging races. In a line with this goal, the Institute of Field and Vegetable Crops Novi Sad has been testing the wild relatives of the sunflower (long-term program) as well as inbred lines in gene bank (short-term program) and identified sources that confer resistance to highly virulent races. Some resistance sources have been found to be controlled by major genes, some have recessive inheritance, but some showed QTL resistance. Race-specific dominant genes are considered as good sources of resistance, but emerging of new races increase the aggressiveness and breakdown vertical resistance. Therefore, pyramiding of more than one resistance gene from different sources into a single genotype would lead to the better ways of achieving durability of resistance. The complexity of host resistance has been also improved using molecular marker analyses for identifying and mapping resistance genes.

- Cvejić, S. Jocić, S. Dedić, B. Radeka, I. Imerovski, I. and D. Miladinović, 2014. Determination of resistance to broomrape in newly developed sunflower inbred lines. In: Proc. 3rd Int. Symp. on Broomrape (*Orobanche* spp.) in Sunflower, Córdoba, Spain. Int. Sunflower Assoc., Paris, France. 184-188.
- Miladinović, D. Jocić, S. Dedić, B. Cvejić, S. Dimitrijević, A. Imerovski, I. and G. Malidža 2014. Current situation of sunflower broomrape in Serbia. In: Proc. 3rd Int. Symp. on Broomrape (*Orobanche* spp.) in Sunflower, Córdoba, Spain. Int. Sunflower Assoc., Paris, France. 33-38.
- Jocić, S. Cvejić, S. Jocković, M. Hladni, N. Dedić, B. Imerovski, I. Miladinović, D. and V. Miklič, 2016. Screening for resistance to highly virulent races of sunflower broomrape (*Orobanche cumana*). Proc. 19th Int. Sunflower Conf., Edirne, Turkey, 29 May-3 June, pp 534.
- Jocković, M. Jocić, S. Cvejić, S. Miladinović, D. Dedić, B. Terzić, S. Marjanović-Jeromela, A. and V. Miklič, 2018. Helianthus species as a sources for broomrape resistance. Proc. 4th Int. Symp. Broomrape in Sunflower, Bucharest, Romania, 2-4 July, 178-186.
- Imerovski, I. Dedić, B. Cvejić, S. Miladinović, D. Jocić, S. Owens, G. Kočiš Tubić, N. and L. Rieseberg, 2019. BSA-seq mapping reveals major QTL for broomrape resistance in four sunflower lines. Molecular Breeding DOI: 10.1007/s11032-019-0948-9.