



1st European EPG Workshop

Madrid, 16-19 June 2024

PROGRAM

Organizers

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Venue: ICA-CSIC (16-19 June 2024). Madrid, Spain

Day 0: 16 June

18:30h-20:00h Welcome Reception & Registration (at ICA-CSIC, [Calle de Serrano, 115 b, Chamartín, 28006 Madrid](#))

Day 1: 17 June

8:45-9:00 Registration (ICA-CSIC)

9:00-10:00 Keynote presentation: Introduction to EPG monitoring of insect behavior. History, background & electronics

Keynote Speaker: Prof. W.F. Tjallingii

10:00-10:30: EPG standard waveforms for different insects (waveform library): Phloem feeders Speaker: Prof. Alberto Fereres

10:30-11:00: Coffee break & Poster Session

11:00-11:30: EPG standard waveforms for different insects (waveform library): Xylem feeders Speaker: Dr. Clara Lago

11:30- 12:00: Non-standard EPG waveforms of aphids and waveform features due to device adjustments Speaker: Prof. W.F. Tjallingii

12:00-12:30. Participant talks

12:00-12:15 Insights from EPG with whiteflies: Position-fixation techniques and tethering
Speaker: Lize Braat

12:15-12:30 EPG as a tool to understand plant/arthropod interaction for crop protection
Speaker: Juan Manuel Alba Cano



12:30-14:00 Lunch & Poster Session

14:00-14:30 Wiring, setting up and calibration of EPG equipment and computerized data acquisition in EPG recording
Speaker: Dr. Elisa Garzo

14:30-16:00 Afternoon Hands-on

16:00-16:30 Coffee break & Poster

16:30- 18:00 Afternoon Hands-on (cont.)

Day 2: 18 June

09:00 -9:30 EPG analysis & data processing for phloem feeders
Speaker: Dr. Elisa Garzo

09:30-10:00 EPG analysis, data processing and workbooks for xylem feeders
Speaker: Dr. Daniele Cornara

10:00-10:30 Keynote talk. An interactive Platform for efficient automatic analysis of EPG signal of piercing sucking insects combining changepoint detection and Machine learning
Keynote Speaker: Prof. Bernard Reynaud

10:30-11:00: Coffee break & Poster Session

11:00-11:30 Guidelines for experimental design, data analysis and interpretation
Speaker: Dr. Aranzazu Moreno

11:30-12:00: Behavioural response to climate change
Speaker: Dr. Piotr Trebicki

12:00-12:45 Participants talks

12:00-12:15 Speed and directionality of electrical signal propagation in plants in response to physical stress
Speaker: Claudio C. Ramirez

12:15-12:30 Identification of plant virus proteins responsible for the manipulation of host phenotype and vector behavior
Speaker: Quentin Chesnais

12:30- 12:45 Identification of plant cues involved in *Rhopalosiphum padi*'s host alternation
Speaker: Rituparna Ghosh

12:45-14:00 Lunch & Poster Session

14:00-16:00 Afternoon Hands-on

16:00-16:30 Coffee break & Poster

16:30- 18:00 Afternoon Hands-on (cont.)



Day 3: 19 June

9:00-9:45 Applications of EPG technique: Transmission of plant pathogens by insect vectors
Speaker: Prof. Alberto Fereres

9:45-10:30: Keynote talk. Applications of EPG technique: Host plant resistance and understanding mode of action of chemical compounds using EPG
Keynote Speaker: Dr. Beata Gabrys

10:30-11:00: Coffee break & Poster Session

11:00-11:30: EPG in combination with additional techniques: cryofixation, CT scan and confocal, stylectomy, video-tracking recording, artificial diets, honeydew clock
Speaker: Dr. Jaime Jiménez

11:30-12:00: Participants talks

11:30-11:45 Cellulose synthase gene expression analysis of *Solanum lycopersicum* exposed to combined effects of drought and TYLCV virus
Speaker: Samra Mirzayeva

11:45-12:00 Aphids as bioelectrodes to measure changes in plant membrane potential in parallel with physiological changes as a result of pathogen infection
Speaker: Torsten Will

12:00-12:30: Questions and Discussion

12:30-14:00 Lunch & posters

14:00-16:00 Afternoon 'Hands-on'. EPG experiments coupled with video-tracking recording, cryofixation, artificial diets, honeydew clock

16:00-16:30 Coffee break & Poster Session

16:30- 18:00 Afternoon Hands-on (cont.)

20:00h: Closing dinner (Restaurante Tragantia, [Calle del Príncipe de Vergara, 210, Chamartín, 28002 Madrid](https://www.tragantia.com/))

NOTE: Participants should bring their own laptop to the workshop and download and install the EPG installation software in advance (at: <https://epg.csic.es/downloads>)

Posters

Alteration of aphid feeding behavior in sugar beet genotypes results in decreased beet yellows virus transmission

Anabella Heintz, Quentin Chesnais, Camille Gutierrez, Alessandra Maia-Grondard, Michael Stange, Sandra Otte, Martin Drucker, Véronique Brault

Does SBR - a new disease of sugar beet - affects the feeding behavior of *Pentastiridius leporinus*?

Brita Kais, J. Koehler, B. Czarnobai De Jorge, Anna Markheiser, J. Gross

Measuring principles in EPGs: Circuit properties and Ohm's law relationships

Freddy Tjallingii

Cold treatment of infected plum fruits reduces the transmission of the PPV by aphids

Claudio C. Ramírez, Angélica González-González, Jessica Devia-Parra, Isabel Ramírez-Abarca, Mónica Madariaga

Exploring diurnal rhythms in aphid feeding behavior through the lens of the Electrical Penetration Graph technique

Daniel Kunk

How do endosymbionts modulate plant virus transmission by aphid vectors?

Patricia Sanches, Consuelo De Moraes, Mark Mescher

AFTERNOON Hands-On PROGRAM

<p>Day 1: Beginners Program</p> <p>EPG recording (data acquisition) <u>DEMO</u></p> <p><u>EPG set up:</u></p> <ul style="list-style-type: none"> - Equipment parts - Noise and Faraday cage - Amplifier test* <p><u>Aphid, whitefly, spittlebug & stink bug wiring</u></p> <ul style="list-style-type: none"> - Making an insect electrode - Proper electrode attachment - Insect and plant mounting* <p><u>Making a first EPG recording</u></p> <ul style="list-style-type: none"> - Stylet⁺-d acquisition software* - Start: name, comments & adjustments - Starting*: 1) Giga ON 2) 'insects ON' - Optimal voltage adjustment* 	<p>Day 2: Stylet+ software practice</p> <p><u>File conversion</u></p> <ul style="list-style-type: none"> - Automatic and comment lines - Manual conversion (separate conversion) <p><u>Analysis software (stylet+a)</u></p> <ul style="list-style-type: none"> - Use of day 1 data files or sample files - Moving, zooming and .ppt signal pictures - Exporting signal samples - Making a 'Book of reference signals' <p><u>Retrieving EPG data</u></p> <ul style="list-style-type: none"> - Cursor use and data grid - Saving the data grid - Frequency & smooth tools <p><u>DATA PROCESSING SOFTWARE:</u></p> <ul style="list-style-type: none"> - Excel Workbooks for calculation of EPG variables (3 programs) - Automatic EPG waveform recognition (2 Programs)
<p>Day 3: Demonstration: <i>other techniques combined with EPG</i></p> <ul style="list-style-type: none"> - Honeydew clock for collecting droplets of plant sap - Cryofixation of aphid stylets - Stylectomy of aphid stylets - Video-tracking recording of spittlebug and aphid feeding - EPG recording in artificial diets <p>Bring in any questions or problems</p>	

* Program items that can be extended for advanced users:

- Special plant voltage adjustments
- Life establishing of R- and emf-components
- Event marks in unused channels