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Chairperson: Nick DOKOOZLIAN

Time	Abstract n°	Description	Abstract page n°
10.50 - 12.10 am		Oral Presentations	
	L33	Hipólito MEDRANO (Universitat de les Illes Balears, Palma, Spain) Exploring the genetic variability in water use efficiency: evaluation of inter and intra cultivar genetic diversity in grapevines	46
	L34	Thierry SIMONNEAU (Institut National de le Recherche Agronomique, France) Breeding for high water use efficiency in grapevine: transpiration at night as a relevant target	47
	L35	Claudio LOVISOLO (University of Torino, Italy) The grapevine <i>VvPIP2;4N</i> aquaporin controls leaf hydraulic capacitance	48
	L36	Annette NASSUTH (University of Guelph, Canada) Deciphering the ICE-CBF frost tolerance pathway in grapes and its overlap with stomatal development	49

12.10 - 1.45 pm - Lunch / Poster Viewing
(Poster Schedule 6: authors P108 – P141 to be present at their posters)

Chairperson: Aaron FAIT

Session 4: Soil, water relations and mineral nutrition

Time	Abstract n°	Description	Abstract page n°
1.45 pm	L37	Plenary Lecture Nathalie OLLAT (INRA, ISVV, France) Grapevine roots: the dark side	50
2.15 - 3.55 pm		Oral Presentations	
	L38	Simone Diego CASTELLARIN (The University of British Columbia, Canada) Modulation of transcripts and metabolites in Merlot berries under drought	51
	L39	Grant R. CRAMER (University of Nevada, USA) Transcriptomic analysis of dehydrated grapevine leaves reveals large differences between three species differing in drought tolerance	52
	L40	Gabriella DE LORENZIS (Università di Milano, Italy) Physiological and transcriptomic responses of two grapevine rootstock genotypes to drought treatments	53
	L41	Gregory GAMBETTA (Institut des Sciences de la Vigne et du Vin, France) Novel insights into drought resistance and recovery in grape	54
	L42	Claudio PASTENES (Universidad de Chile, Chile) Whole plant water potential and loss of hydraulic conductivity does not depend on stomatal control upon water stress: evidence from three grapevine varieties	55

3.55 - 4.30 pm - Coffee Break / Poster Viewing
(Poster Schedule 7: authors P142 – P160 to be present at their posters)

Chairperson: Andrea SCHUBERT

Time	Abstract n°	Description	Abstract page n°
4.30 - 6.10 pm		Oral Presentations	
	L43	Silvina DAYER (Universidad Nacional de Cuyo, Argentina) Relationship between hydraulic and stomatal conductance and its regulation by root and leaf aquaporins under progressive water stress and recovery and exogenous application of ABA in grapevine	56
	L44	Jose Carlos HERRERA (University of Udine, Italy) Is water stress induced embolism in grapevines a common phenomenon? Hints from MRI and microCT visualizations	57
	L45	Susanne TITTMANN (Hochschule Geisenheim University, Germany) Physiological responses of grapevine (<i>Vitis vinifera</i> cv. Müller-Thurgau) to different water and nitrogen application	58
	L46	Anita ZAMBONI (Università di Verona, Italy) Physiological and molecular characterization of Mg deficiency in grapevine rootstocks with different tolerance	59
	L47	Nicolás FRANCK (Universidad de Chile, Chile) Evaluating summer pruning and organic soil amendment as strategies for enhancing the resilience of table grape production under increasing drought severity	60



L35

The grapevine *VvPIP2;4N* aquaporin controls leaf hydraulic capacitance

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Our study highlights that leaf hydraulic capacitance (Ch), as well as leaf hydraulic resistance (Rh) are influenced by the constitutive over-expression of *VvPIP2;4N* aquaporin.

Ch in a plant tissue buffers the xylem tension storing and releasing water and has been highlighted in recent years as an important factor that affects water relations such as drought tolerance and embolism formation. Aquaporins are well known to control leaf hydraulic resistance (Rh) but their role in the control of Ch is unknown. Here, we assess Rh and Ch on detached grapevines leaves (cv. Brachetto) wild type (WT) and over-expressing the aquaporin gene *VvPIP2;4N* (OE). For this purpose, we developed a new method inspired from the pressure-volume curve technique and the rehydration kinetic method, which allowed us to monitor the dynamics of dehydration and rehydration in the same leaf. The recovery after dehydration was measured in the dark, in light non-transpirative conditions, light-transpirative conditions and transpirative condition adding abscisic acid (ABA).

Pressurizing leaves in the OE line, the recorded Rh and Ch were respectively lower and higher than those in the WT. The same results were obtained in the dark recovery treatment. In the presence of light, either when leaves transpired or not (by depressing vapour pressure deficit), the described effects disappeared. The change in these hydraulic traits did not affect the kinetics of desiccation of detached leaves in the dark in air, in OE plants compared to WT.

The effect of aquaporins on Ch is reported here for the first time and may involve a modulation of cell reflexion coefficient.

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