



I the undersigned ask to participate in the public selection, for qualifications and examinations, for the awarding of a type B fellowship at **Dipartimento di Scienze Agrarie e Ambientali - Produzione, Territorio, Agroenergia**, Scientist- in - charge **Prof. Gian Attilio Sacchi**.

## Moez Maghrebi

### CURRICULUM VITAE

#### PERSONAL INFORMATION

Surname	Maghrebi
Name	Moez
Date of birth	26/04/1985

#### PRESENT OCCUPATION

Appointment	Structure
Collaboration for research activity	Università degli Studi di Milano, Dipartimento di Scienze Agrarie e Ambientali - Produzione, Territorio, Agroenergia (DISAA).

#### EDUCATION AND TRAINING

Degree	Course of studies	University	year of achievement of the degree
Degree	Scienze della Vita et della Terra	Università di Sfax/ Tunisia	2008
PhD	Biologia Vegetale e Produttività della Pianta Coltivata	Università degli Studi di Milano/ Italia	2015
Master	Biologia e Ecofisiologia degli Organismi Vegetali	Università di Sfax/ Tunisia	2010



## FOREIGN LANGUAGES

Languages	level of knowledge
Arabic	Mother tongue
English	B1/B2
French	C1/C2
Italian	B1/B2

## AWARDS, ACKNOWLEDGEMENTS, SCHOLARSHIPS

Year	Description of award
2011-2014	Marie Curie Research Fellowship

## TRAINING OR RESEARCH ACTIVITY

Description of activity
<ul style="list-style-type: none"><li>• <b>Master research</b> under the joint supervision of Laboratory of Extremophile Plants (LPE) in the Center of Biotechnology Borj-Cedria (CBBC) (Tunis-Tunisia) and the University of Sfax, Faculty of Sciences (Tunisia): 2008-2010. <u>Research advisor:</u> Prof. Abderrazak Smaoui. <u>Master topic:</u> Exploration of the variability of the response to Salt Stress of some Tunisian provenances of <i>Polypogon monspeliensis</i> (Poaceae).</li></ul> <p>The research group of Prof. Chedly Abdely was interested in the identification, physiological and biochemical characterization of saline habitats to offer candidate species for the creation of productive systems in saline areas. The principal goal of my work was to explore the salt response variability among different origins of the halophyte <i>Polypogon monspeliensis</i> based on physiological parameters. I learned nutritional and photosynthetic responses to a wide range of salt concentrations for the identification of tolerant species to salinity to improve the productivity of saline soils.</p>
<ul style="list-style-type: none"><li>• <b>Doctor of Philosophy-PhD</b> within the Marie Curie Actions. Department of Agricultural and Environmental Sciences - Production, Landscape, Agroenergy (DISAA) of the University of Milan (Italy): 2011-2015.</li></ul> <p><u>Research advisor:</u> Prof. Gian Attilio Sacchi. <u>Thesis topic:</u> Sentinel plants to improve nutrient use efficiency: living tools for nondestructive analysis under field conditions.</p> <p>The research group of Prof. Gian Attilio Sacchi was interested in studying Sulfate nutrition and to determine Sulfate bioavailability and/or crop nutritional status to monitor soil Sulfate dynamics and to better manage fertilization practices for different crops in a variety of environments by developing specific bioassays based on the use of "sentinel plants", or bioindicators (<b>BIONUT project</b>). During my doctoral thesis, I studied the evaluation of a candidate gene for the development of a specific plant molecular bioindicator which senses plant sulfur nutritional status by using Arabidopsis mutants and transgenic lines. Firstly,</p>



Arabidopsis gene-trap lines were characterized in different conditions to elucidate changes in plant sulfur requirements. Then, novel sulfur responsive genes were identified by a gene-trap approach and the respective promoters were characterized to identify sulfur responsive elements (*cis*-acting elements) by a minimal promoter approach in Arabidopsis. Finally, recombinant promoters were constructed by GUS gene fusion and the selected recombinant promoters were evaluated via transformation in *Arabidopsis thaliana*. The resultant transgenic lines were analyzed by histochemical and microscopic techniques. Later, this approach will be applied in crop species for correctly predicting nutrient availability and nutritional requirement in a crop system to optimize the timing of fertilization.

- **Researcher** (Collaboration for research activity) at the Department of Agricultural and Environmental Sciences - Production, Landscape, Agroenergy (DISAA) of the University of Milan (Italy): March-September 2016.

The research group of Prof Gian Attilio Sacchi is interested in the evaluation of rice germplasm collection of 300 *japonica* rice varieties in order to identify new salt-tolerant accessions among worldwide japonica rice cultivars (**NEURICE project**). During the first year, my principal activity was phenotyping of the germplasm collection which was conducted in a greenhouse on pots filled with submerged soils with a mid-level of salinity controlled by conductivity. Different parameters will be evaluated: i) comparison of germination rate in saline and non-saline soil; ii) plants growth curve and leaf damages evaluation monitored at different phenological stages by semi-automated photo cameras and dedicated software system; iii) thermal imaging at different phenological stages using long-wave infrared cameras; iv) spikelet sterility. Depending on the tolerance level to salt treatment, the germplasm will be divided into clusters and the tolerance data will be compared with genotypic data (molecular markers) to extract a core collection of a few genotypes, representative of the entire variability for salt tolerance in the whole germplasm collection.

- **Researcher** (Collaboration for research activity) at the Department of Agricultural and Environmental Sciences - Production, Landscape, Agroenergy (DISAA) of the University of Milan (Italy): April-September 2017.

The research group of Prof. Gian Attilio Sacchi is interested in the evaluation of rice germplasm collection of 300 *japonica* rice varieties in order to identify new salt-tolerant accessions among worldwide japonica rice cultivars (**NEURICE project**). During the second year, my principal activity was phenotyping of the germplasm collection (with a 5 ds/m) and the core collection defined the first year (with a 10 ds/m) which were conducted in a greenhouse and the same parameters were evaluated. The phenotyping data will be used for genome-wide association studies (GWAS).

- **Post-doctoral position** at the Department of Agricultural and Environmental Sciences - Production, Landscape, Agroenergy (DISAA) of the University of Milan (Italy): February 2018-2020.

The research group of Prof Gian Attilio Sacchi is interested in the evaluation of the root architectural system and adaptability of rice associated with new cultivation techniques for soil management (Leguminous green manures and conservation agriculture) (**RISTEC project**). To characterize the root system architecture (RSA), roots were excavated, washed, then



photographed and the images were analyzed with the SmartRoots software. This program allows defining root growth angle, length, number, diameters, and area of the roots. This study aimed to evaluate the variation of plasticity in RSA among rice cultivars in response to different cultivation techniques and help the choice of rice cultivars with specific root systems equipped with more suitable architectures for the edaphic conditions imposed for the overall efficiency of the agro-techniques. It has also been determined how nitrogen nutritional status of rice plants and therefore the efficiency of use of the nitrogen supplied with green manure and/or additions with synthetic fertilizers, can be established using the definition of a set of profiles of expression of specific genes confronted with the results of traditional chemical analyzes for the definition of N levels in the shoots, as well as evaluating the NBI index (Nitrogen Balance Index) with the use of the Dualex optical sensor.

- **Researcher** (Collaboration for research activity) at the Department of Agricultural and Environmental Sciences - Production, Landscape, Agroenergy (DISAA) of the University of Milan (Italy): February-April 2020.

The research group of Prof. Gian Attilio Sacchi is interested in the evaluation of rice germplasm collection of 300 *japonica* rice varieties in order to identify new salt-tolerant accessions among worldwide japonica rice cultivars (**NEURICE project**). My principal activity was analyzing the data related to the evaluation of physiological and genetic parameters for the identification of candidate genes and metabolic pathways involved in salt stress tolerance, starting from genome wide association study (GWAS) results, in a collection of rice accessions. It has also been planned to analyze the variability, in rice accessions, of physiological parameters deriving from phenotyping activities in relation to tolerance to saline stress.

## PROJECT ACTIVITY

Year	Project
2011-2014	“BIONUT: Biochemical and genetic dissection of control of plant mineral nutrition” The Marie Curie Actions-Network for Initial Training (ITN)-VII Marie Curie Program.
2016-2020	“NEURICE: New commercial European RICE” ( <i>Oryza sativa</i> ) harboring salt tolerance alleles to protect the rice sector against climate change and apple snail ( <i>Pomacea insularum</i> ) invasion”.
2018-2020	RISTEC: Nuove tecniche colturali per il futuro della risicoltura.

## CONGRESSES AND SEMINARS

Date	Title	Place
19-22/12/ 2010	International Days of Biotechnology. Tunisian Association of Biotechnology	Yasmine Hammamet, Tunisia
27-29/09/ 2011	1 <sup>st</sup> BIONUT meeting: State of the art in Plant nutrition research	University of Padova, Italy
29/09/2011- 01/10/2011	3 <sup>rd</sup> Sulphyton meeting: Plant sulfur research	University of Padova, Italy



## UNIVERSITÀ DEGLI STUDI DI MILANO

13/10/2011	Genomics workshop for research and molecular diagnostics	Parco Tecnologico Padano, Lodi, Italy
18-19/09/2012	XXX National conference of Società Italiana di Chimica Agraria” (SICA)	University of Milan, Italy
18/02/2013	Conference of Biogesteca project	University of Milan, Italy
25/10/2013	Genomic workshop: Making Sense of Next Generation Sequencing	Parco Tecnologico Padano, Lodi, Italy
14-17/04/2014	9 <sup>th</sup> International Workshop on Sulfur Metabolism in Plants: Molecular Physiology and Ecophysiology of Sulfur	Freiburg, Germany
31/05/2014-03/06/2014	Final BIONUT meeting	Potsdam, Germany
24-27/09/2014	Federazione Italiana Science della Vita (FISV) 2014 XIII Congress	Pisa, Italy
24/11/2011	Seminar: Ecogenomics of haloalkaliphilic sulfur bacteria	University of Milan, Italy
10/12/2012	Statistic seminar: Sizing of the experiments and the most common mistakes in the application of analysis of variance	University of Milan, Italy
18/12/2012	Seminar: Peach fruit development: how pericarp and seed can talk?	University of Milan, Italy
17/01/2013	Seminar: Paradigm shifts in Plant Breeding: Molecular Mutagenesis in Molecular Breeding for Traits Improvement	University of Milan, Italy
18/01/2013	Seminar: Intellectual Property Rights and Innovation in Plant Biotechnology	University of Milan, Italy
31/01/2013	Seminar: African rice varieties: nutritional properties and technological perspectives	University of Milan, Italy
15/05/2013	Seminar: Genetic markers for breeding: from marker-assisted selection to genomic selection	University of Milan, Italy
22/02/2013	Seminar: Grant and fund access for research projects.	University of Milan, Italy
23/04/2013	Seminar: Research valorization	University of Milan, Italy
07/05/2013	Seminar: Intellectual Property	University of Milan, Italy
22/05/2013	Seminar: Research writing and presentation	University of Milan, Italy
23/01/2013	Seminar: Ovule and seed development: Analysis of the master regulator seed stick	University of Milan, Italy
24/01/2014	Seminar: Control of vein patterning by auxin transport.	University of Milan, Italy
12/05/2014	Seminar: Yes, indeed most Americans eat GMO foods nearly every day	Institute of Agriculture Biology and Biotechnology (IBBA), Milan, Italy



10/07/2018	Rice Days	University of Milan, Italy
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## PUBLICATIONS

### Books

**Maghrebi M, Rabhi M, Smaoui A (2014).** La réponse de *Polypogon monspeliensis* (L.) Desf à la contrainte saline : Exploration de la variabilité de la réponse chez quelques provenances tunisiennes, Presses Académiques Francophones, ISBN-13: 978-3-8381-4705-5.

**Maghrebi M, Nocito F.F, Sacchi G.A (2014).** Monitoring plant nutritional status. In: (Eds): Hawkesford M.J; Kopriva S; De Kok L.J, Nutrient Use Efficiency in Plants. p. 253-272, Springer, ISBN: 978-3-319-10634-2.

### Articles in reviews

Ferri A, Lancilli C, **Maghrebi M**, Lucchini G, Sacchi G.A, Nocito F.F (2017) The sulfate supply maximizing Arabidopsis shoot growth is higher under long- than short-term exposure to Cadmium. *Frontiers in Plant Science*. 8:854. doi: 10.3389/fpls.2017.00854.

Orasen G, De Nisi P, Lucchini G, Abruzzese A, Pesenti M, **Maghrebi M**, Kumar A, Nocito FF, Baldoni E, Morgutti S, Negrini N, Valè G, Sacchi GA (2019) Continuous Flooding or Alternate Wetting and Drying Differently Affect the Accumulation of Health-Promoting Phytochemicals and Minerals in Rice Brown Grain. *Agronomy*, 9, 628.

Moretti B, Celi L, Vitali A, Lerda C, Sacchi G, **Maghrebi M**, Abruzzese A, Beltarre G, Romani M, Sacco D (2019) Ottimizzare le produzioni risicole con l'agricoltura conservativa. *L'Informatore Agrario*. Vol. 24-25. p. 31-34.

### Communications to congresses and scientific meetings

**Maghrebi M, Rabhi M, Giuntini D, Remorini D, Castagna A, Smaoui A, Ranieri A, Abdely C (2010)** Comparative study of the photosynthetic response of two obligatory halophytes; *Sesuvium portulacastrum* and *Tecticornia indica*, for salinity. *International Days of Biotechnology. Tunisian Association of Biotechnology*. 19-22 December, Yasmine Hammamet, Tunisia (poster).

Rizzardo C, **Maghrebi M**, Iacono R, Sacchi GA, Nocito FF (2012) Use efficiency of sulfur in rice and wheat. *Conference of Biogesteca project*. 18 February. Milano, Italia (poster).

**Maghrebi M, Lancilli C, Nocito FF, Sacchi GA (2014)** Preliminary characterization of two pilot bioindicators for sulfur nutritional status. *9th International Workshop on Sulfur Metabolism in Plants: Molecular Physiology and Ecophysiology of Sulfur*. 14-17 April. Freiburg, Germany (poster).

**Maghrebi M, Lancilli C, Ferri A, Nocito FF, Sacchi GA (2014)** Sentinel plants to improve sulfur use efficiency: living instruments for nondestructive analysis. *Federazione Italiana Scienze della Vita (FISV) 2014 XIII Congress*. 24-27 September. Pisa, Italy (oral presentation).

Baldoni E, Orasen G, **Maghrebi M**, Pesenti M, Abruzzese A, Nocito FF, Sacchi GA (2016) Phenotyping of a worldwide *japonica* rice collection under salt stress treatment for association study. *The 14th International Symposium on Rice Functional Genomics (ISRFG)*. 26-29 September. Montpellier, France (poster).

Pesenti M, Orasen G, Abruzzese A, **Maghrebi M**, Dell'Orto M, De Nisi P, Baldoni E, Rai AC,





Volante A, Valè G, Negrini N, Morgutti S, Vigani G, Nocito FF, Sacchi GA (2017) Genome-wide association study for mild-salt tolerance in rice. XXXV Convegno Nazionale SICA (Società Italiana di Chimica Agraria). 11-13 September. Scuola Superiore dell'Università di Udine, Italy (oral presentation).
Orasen G, Baldoni E, Abruzzese A, Pesenti M, <b>Maghrebi M</b> , Volante A, Nocito FF, Dell'Orto M, De Nisi P, Valè G, Sacchi GA (2017) Genome-Wide Association Study for Mid-Salt Tolerance in Rice. International Temperate Rice Conference. 6-9 March. Griffith, NSW, Australia (oral presentation).
Nocito FF, <b>Maghrebi M</b> , Lucchini G, Sacchi GA (2018) Analisi funzionale del gene At1g12030 di Arabidopsis thaliana: effetti della sua sovraespressione sulla ripartizione del solfato fra radice e germoglio e sulla tolleranza delle piante al cadmio. XXXVI Convegno Nazionale SICA (Società Italiana di Chimica Agraria). 24-26 September. Università degli Studi Mediterranea di Reggio Calabria, Italy (poster).
Cavallaro V, Caschetto M, <b>Maghrebi M</b> , Sacchi GA, Nocito FF (2019) Sulfur isotope mass balance reveals $^{32}\text{S}/^{34}\text{S}$ fractionation during sulfate uptake and translocation in rice. First Joint Meeting on Soil and Plant System Sciences (SPSS). 23-26 September. Bari, Italy (poster).

## OTHER INFORMATIONS

<b>Personal skills</b>
<b>Technical skills</b> . Plant physiology techniques: Plant culture in soil and in hydroponics, in vitro plant culture, plant gas exchange parameters, atomic absorption spectroscopy, microscopy, spectrophotometric measurements, Leaf Area Index measurements (Pocket LAI), Leaf temperature measurement (Thermal imaging camera), Electrical Conductivity measurement, Chlorophyll Fluorescence measurements (Chlorophyll fluorescence meter), Chlorophyll Content measurement (Dualox). . Molecular biology techniques: Bacterial transformation, plasmid construction and molecular cloning, Arabidopsis transformation by floral dip, genetic screens, GUS gene approach, GUS staining, DNA/ RNA extraction, primer design, gel electrophoresis, polymerase chain reaction (PCR), real-time PCR (qPCR).
<b>Digital competence</b> Office automation (Word, Excel, PowerPoint), Digital image analysis (SmartRoot, Photoshop, ImageJ), statistics software (SPSS, SigmaPlot), Sequences analysis software (BioEdit, BLAST).
<b>Communication skills</b> Ability to work well as part of a team and to adapt to multicultural environments while working together thanks to the experience of studying abroad. Good communication skills, obtained thanks to my experience as a collaborator for research activities within the Marie Curie program through courses and workshops and research visits to different laboratories, both in academia and industry.



## Academic activities

. Academic Year 2018/2019: University of Milan, Italy.

Didactic activity of Biochemistry and Plant Physiology for the course of Conservation and Sustainable Development of Mountain Areas (Extraction and separation of photosynthetic pigments).

. Academic Year 2018/2019: University of Milan, Italy.

Adjunct Professor of Environmental Laboratory for the master's degree programme in Agricultural and Environmental Sciences (LM-73) (Define the physiological aspects of plant adaptation to abiotic environmental stresses).

. Academic Year 2017/2018: University of Milan, Italy.

Didactic activity of Biochemistry and Plant Physiology for the course of Conservation and Sustainable Development of Mountain Areas (Extraction and separation of photosynthetic pigments).

Declarations given in the present curriculum must be considered released according to art. 46 and 47 of DPR n. 445/2000.

The present curriculum does not contain confidential and legal information according to art. 4, paragraph 1, points d) and e) of D.Lgs. 30.06.2003 n. 196.

Place and date: Milano, 17/04/2020

SIGNATURE