

# CURRICULUM VITAE

EUROPEAN FORMAT

## PERSONAL INFORMATION

Name, Surname	Massimo Zacchini
Place and Date of birth	Massa Marittima (GR), 27/04/1964
Nationality	Italian
Research Institution	Research Institute on Terrestrial Ecosystems (IRET) of the National Research Council of ITALY (CNR)
Work address	IRET- CNR Research Area of Roma 1-Montelibretti
House number, street name, postcode, city, country	Via Salaria Km. 29,300 00015 Monterotondo Scalo (RM) ITALY
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## WORK EXPERIENCE

Dates (from – to)	<p>From 2001 - at present: Permanent research position at the Section of Montelibretti of the Research Institute on Terrestrial Ecosystems (IRET), formerly Institute of Agroenvironmental and Forest Biology (IBAF);</p> <p>From 2020 at present: Adjunct Professor of Plant Physiology at Università degli Studi Roma1-La Sapienza – Department of Environmental Biology;</p> <p>From 2010 – to 2018: Head of the Section of Montelibretti of the Institute of Agroenvironmental and Forest Biology (IBAF);</p> <p>From 1994- to 2001: Post-doctoral position at Plant Biochemistry and Ecophysiology Institute, CNR Monterotondo Sc. (Rome),</p>
Type of business or sector	Research
Occupation or position held	<ul style="list-style-type: none"><li>- Head of the Tissue culture laboratory at the Section of Montelibretti of the Research Institute on Terrestrial Ecosystems (IRET-CNR)</li><li>- Senior Researcher</li></ul>
Main activities and responsibilities	<ul style="list-style-type: none"><li>- Coordination of the Research group activity on Phytoremediation and Plant Ecotoxicology at the Section of Montelibretti of the Research Institute on Terrestrial Ecosystems (IRET-CNR),</li><li>- Research coordination at the Tissue culture laboratory of the Section of Montelibretti of the Research Institute on Terrestrial Ecosystems (IRET-CNR)</li></ul>

## EDUCATION AND TRAINING

Dates (from – to)	1991-1993 Ph.D. student
Name and type of organisation providing education and training	Scuola Superiore di Studi Universitari e Perfezionamento (SSSUP) "S. Anna" in Pisa, public University (Italy)
Principal subjects occupational skills covered	Plant Physiology, Tissue culture; Micropropagation

Title of qualification awarded	Ph.D. graduation
Dates (from – to)	1983-1990 University education
Name and type of organisation providing education and training	Faculty of Agronomy at University of Study of Pisa (Italy)
Principal subjects occupational skills covered	Agronomy, Horticultural science, Plant Physiology, Tissue culture; Micropropagation, Microscopy
Title of qualification awarded	Degree in Agronomy

## RESEARCH ACTIVITIES

### BIBLIOMETRIC INDICES

h-index : 27 (Google scholar)

Sum of Times Cited: 2488

### RESEARCH SECTORS

Phytoremediation: Selection of genotypes useful for the decontamination of substrates polluted by inorganic and organic compounds. Investigation on the physiological and biochemical traits associated to phytoremediation properties

-Metal uptake and transport in plants: Role of sulfur compounds (thiols and phytochelatins), organic acids (malic, citric, oxalic acids), free polyamines (putrescine, spermidine and spermine)

-Plant ecotoxicology: Biometric, physiological and biochemical assessment of the effects of xenobiotics in terrestrial and aquatic plants by toxicity tests

-Antioxidative response in plants: Biochemical studies of the role exerted by enzymatic and non enzymatic compounds

-Tissue culture: Establishment and maintenance, modulation of growth and regeneration by light, oxidative status in culture, selection of stress tolerant cell lines

Keywords: Ecotoxicology; Phytoremediation; Plant stress physiology; Oxidative stress; Plants and environmental pollutants; Plant tissue culture.

### RECENT SCIENTIFIC ACTIVITIES

-Scientific responsible of the Joint Project CNR- SRNSF (Durmishidze Institute of Biochemistry and Biotechnology of Georgian Agricultural University, Tbilisi) "High efficiency Phyto(co)remediation Technology as a Prompt Strategy Against Chemical Pollution of Water" (2018-2019)

-Project manager and contact person of the EU-INDIA Project "Technological Eco - Innovations for the Quality Control and the Decontamination of Polluted Waters and Soils" [contract ICI+/2014/342-817] (2014-2018)

-Scientific responsible of the Joint Project CNR-ASM (Academy of Science of Moldova): Improving productivity and environmental sustainability of vine (*Vitis vinifera* L.) cultivation under unfavorable growing conditions by the use of trace elements and microorganisms (2015-2016)

-Scientific responsible of the Joint Project CNR-RAS (Russian Academy of Sciences) "Mechanisms of plant adaptation to stress action of heavy metals: possible implications for the phytoremediation technology" (2011-2013)

-Member of the Editorial Board of the international scientific journals: "Science of the Total Environment" (ISSN 0048-9697; IF: 5.58), "Water" (ISSN 2073-4441; IF: 2.52), "Journal of Plant Studies" (ISSN 1927-0461), Journal of Applied Biotechnology (ISSN 2327-0640), Journal of Plant Chemistry and Ecophysiology (ISSN 2572-4371)

-Guest Editor of the Special Issue "Technological Eco - Innovations for the Quality Control and the Decontamination of Polluted Waters and Soils" on the international scientific journal "Water" (ISSN 2073-4441; IF: 2.52);

-Guest Editor of the Special Issue "Environmental Restoration of Metal-Contaminated Soils" on the international scientific journal "Applied Science" (ISSN 2076-3417; IF: 2.21);

-Lecturer at Lodz University of Technology (Poland) – Ph.D. course at the Faculty of Biotechnology and Food Sciences (2019);

-Member of the Scientific Italian Commission at the Italian Ministry of Environment for the application of the "Convention on International Trade in Endangered Species of Wild Fauna and Flora" (CITES) - (2014 - at present)

-Member of the Steering Committee of the Indo-Italian Centre of Excellence for the Environmental Sustainability (2015 - at present)

-Member of the referee's panel for the Evaluation of the Quality of the Italian Research (VQR

2011-2014) for the Italian Ministry of Education, University and Research

- Member of the Scientific Committee of the "TECO Networking Conference" held in New Delhi (India) in November, 2016 and "TECO Joint Workshop +EU Promotional Event on Water Collaboration" held in New Delhi (India) in November, 2017
- Member of the Scientific Board of the 3rd ScienceOne International Conference on Environmental Sciences (ICES 2014), Dubai 1-2014
- Scientific responsible of the project PIF-PSR "Valorisation of olive oil and landscape protection of Sabina area (funded by Lazio Region, Italy 2010-2012)
- Scientific responsible of the project FILAS (Project of R&D in cooperation with the SME-funded by Lazio Region, Italy) "SIAA- Information System of Automation in Agriculture" in cooperation between CBR-IBAF and Polis Net Srl (2012-2014)
- Scientific responsible of the research unit IBAF-CNR in the PRIN Project "Molecular-genetic, physiological and cultural analyses for the selection and the management of Salicaceae plants useful for phytoremediation" funded by Italian Ministry of University and Research (2008)
- Scientific collaborator in the Italian group of the Project "Aplicación de NiRS (near infrared reflectance spectroscopy) para la cuantificación de la actividad antioxidante en especies vegetales del bosque mediterráneo" funded by Generalitat de Catalunya y GDRE (Groupement de Recherches Europeen) (2006-2007)
- Visiting scientist at the Department de Biologia Vegetal, Unidad de Fisiologia Vegetal, University of Barcelona (Spain) in 2004, 2005 and 2010, at the Plant Physiology Institute of RAS, Moscow (Russia), May 2011 and June 2013, at the Institute of Genetics, Physiology and Plant Protection ASM, Chisinau, (Moldova) June 2015 and July 2016; at the Georgian Agricultural University, Tbilisi (Georgia) November 2018
- Invited speaker in the workshop "Poplar and willow: from stress physiology to phytoremediation application". Scuola Superiore S. Anna –Pisa -18 April 2014
- Chairperson and invited speaker in the 8<sup>th</sup> and 9<sup>th</sup> International Scientific Conference "The Vital Nature Sign". Kaunas (Lithuania) 15-16 May 2014 and 13-16 May (2015)
- Chairperson of the scientific session "Phytoremediation of heavy metal contaminated sites" in the "4th European Bioremediation Conference" Chania (Greece), September 2008 and of the scientific session "Biomonitoring of Ecosystems" in the "16th International Conference on Heavy Metal in the Environment (ICHMET), Rome 23-27 September 2012
- Tutor activity: Ph.D. student Ph.D. in "Landscape and agroforestry engineering" University of Bari, Italy (2004-2007); Ph.D. student in "Forest Ecology" at DISAFRI –University of Viterbo (Italy) (2009-2014); Fellowship for the Ministry of Science –Spain (2005); Ph.D. student from RAS-Moscow-Russia (2011); Erasmus student Vytautas Magnus University - Kaunas – Lithuania (2015); M.Sc. student from University of Technology - Lodz (Poland) –EU social fund (2016)
- Project reviewer for "The Fund for Scientific Research – F.R.S.- FNRS", Belgium
- Referee for more than 50 international scientific journals dealing with plant physiology, plant biochemistry and phytoremediation

## RECENT BOOKS AND ARTICLES

1. F. Pietrini, M. Zacchini (2020) A new eco-toxicity assay for aquatic plants: Eco-Tox Photosystem Tool (ETPT). Trends in Plant Science 25 (12), 1266-1267 <https://doi.org/10.1016/j.tplants.2020.08.012>
2. Pietrini, F., Iori, V., Pietrosanti, L., Zacchini, M., Massacci, A. (2020) Evaluation of Multiple Responses Associated with Arsenic Tolerance and Accumulation in *Pteris vittata* L. Plants Exposed to High As Concentrations under Hydroponics. Water, 12, 3127
3. F. Francucci, F. Trincardi, A. Barbanti, M. Zacchini, M. Sprovieri. (2020) Linking bioeconomy to redevelopment in contaminated sites: potentials and enabling factors. Frontiers in Environmental Science, 8:144, doi: 10.3389/fenvs.2020.00144
4. Pietrini, F., Passatore, L., Fischetti, E., Carloni, S., Ferrario, C., Polesello, S., Zacchini, M. (2019). Evaluation of morpho-physiological traits and contaminant accumulation ability in *Lemna minor* L. treated with increasing perfluorooctanoic acid (PFOA) concentrations under laboratory conditions. Science of The Total Environment, 133828
5. Pietrini, F., Carnevale, M., Beni, C., Zacchini, M., Gallucci, F., Santangelo, E. (2019). Effect of Different Copper Levels on Growth and Morpho-Physiological Parameters in Giant Reed (*Arundo donax* L.) in Semi-Hydroponic Mesocosm Experiment. Water, 11, 1837
6. De Cesare, F., Pietrini, F., Zacchini, M., Scarascia Mugnozza, G., Macagnano, A. (2019). Catechol-Loading Nanofibrous Membranes for Low-Impact Iron Nutrition of Plants.

7. Grenni, P., Patrolecco, L., Rauseo, J., Spataro, F., Di Lenola, M., Aimola, G., Zacchini, M., Pietrini, F., Di Baccio, D., Stanton, I.C., Gaze, W. H., Barra Caracciolo, A. (2019). Sulfamethoxazole persistence in a river water ecosystem and its effects on the natural microbial community and *Lemna minor* plant. *Microchemical Journal*, 103999.
8. Pietrini, F., Passatore, L., Patti, V., Francocci, F., Giovannozzi, A., Zacchini, M. (2019). Morpho-Physiological and Metal Accumulation Responses of Hemp Plants (*Cannabis Sativa* L.) Grown on Soil from an Agro-Industrial Contaminated Area. *Water*, 11(4), 808.
9. Pietrini, F., Iori, V., Pietrosanti, L., Passatore, L., Zuin, M. C., Aromolo, R., Capotorti, G., Massacci, A., Zacchini, M. 2018. A Survey on the Metal(loid) Accumulation Ability of Spontaneous and Established Plants for the Phytomanagement of an Industrial Landfill in the Venice Lagoon. In *Phytoremediation: Management of Environmental Contaminants*, Volume 6, Ansari, A.A., Gill, S.S., Gill, R., Lanza, G.R., Newman, L. (Eds) Springer 2018. Chapter 6, pp. 113-131
10. F. Pietrini, D. Di Baccio, V. Iori, S. Veliksar, N. Lemanova, L. Juškaitė, A. Maruška, M. Zacchini (2017) Investigation on metal tolerance and phytoremoval activity in the poplar hybrid clone “Monviso” under Cu-spiked water: Potential use for wastewater treatment. *Science of the Total Environment* 592: 412-418
11. J. Fernández-Martínez, R. Joffre, M. Zacchini, B. Fernández-Marín, J. García-Plazaola, I. Fleck (2017). Near-Infrared Reflectance Spectroscopy allows rapid and simultaneous evaluation of chloroplast pigments and antioxidants, carbon isotope discrimination and nitrogen content in *Populus* spp. leaves. *Forest Ecology and Management* 399: 227–234
12. Iori V, Pietrini F, Bianconi D, Mughini G, Massacci A, Zacchini M (2017) Analysis of biometric, physiological, and biochemical traits to evaluate the cadmium phytoremediation ability of eucalypt plants under hydroponics. *iForest - Biogeosciences and Forestry* 10: 416-421.
13. F. Pietrini, V. Iori, T. Beone, D. Mirabile, M. Zacchini (2017) Effects of a ladle furnace slag added to soil on morpho-physiological and biochemical parameters of *Amaranthus paniculatus* L. plants. *Journal of Hazardous Materials* 239: 339-347
14. D. Di Baccio, F. Pietrini, P. Bertolotto, S. Pérez, D. Barcelò, M. Zacchini, E. Donati. (2017) Response of *Lemna gibba* L. to high and environmentally relevant concentrations of ibuprofen: Removal, metabolism and morpho-physiological traits for biomonitoring of emerging contaminants. *Science of the Total Environment* 584-585: 363-373
15. V. Iori, M. Gaudet, F. Fabbrini, F. Pietrini, I. Beritognolo, G. Zaina, A. Massacci, G. Scarascia Mugnozza, M. Zacchini, M. Sabatti. (2016) Physiology and Genetic Architecture of Traits Associated With Cadmium Tolerance and Accumulation in *Populus nigra*. *Trees - Structure and Function* 30: 125-139
16. F. Pietrini, V. Iori, D. Bianconi, G. Mughini, A. Massacci, M. Zacchini. (2015) Assessment of physiological and biochemical responses, metal tolerance and accumulation in two eucalypt hybrid clones for phytoremediation of cadmium-contaminated waters. *Journal of Environmental Management* 162: 221-231
17. F. Pietrini, D. Di Baccio, J. Aceña, S. Pérez, D. Barceló and M. Zacchini (2015). Ibuprofen exposure in *Lemna gibba* L.: Evaluation of growth and phytotoxic indicators, detection of ibuprofen and identification of its metabolites in plant and in the medium. *Journal of Hazardous Materials*. 300: 189–193
18. F. Pietrini, V. Iori, A. Cheremisina, N.I. Shevyakova, N. Radyukina, V.L. V. Kuznetsov, M. Zacchini. (2015) Evaluation of nickel tolerance in *Amaranthus paniculatus* L. plants by measuring photosynthesis, oxidative status, antioxidative response and metal-binding molecule content. *Environmental Science and Pollution Research* 22:482–494
19. Iori V., Pietrini F., Massacci A. and Zacchini M. (2015) Morpho-physiological responses, heavy metal accumulation and phytoremoval ability in four willow clones exposed to cadmium under hydroponics. In: *Phytoremediation: Management of Environmental Contaminants*, Vol I, Eds: A. A. Ansari, S. S. Gill, R. Gill, G. R. Lanza, L. Newman, Pp. 87-98, ISBN 978-3-319-10394-5, Springer International Publishing Switzerland
20. J. Fernández-Martínez, M. Zacchini, B. Fernández-Marín, J.I. García Plazaola, I. Fleck. (2014) Gas-exchange, photo- and antioxidant protection, and metal accumulation in I-214 and Eridano *Populus* sp. clones subjected to elevated zinc concentrations. *Environmental Experimental Botany* 107: 144-153

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