

PROFILE

Dr. Khalvati has spent his career on environmentally sustainable land use and remediation of contaminated soils, enviro-agronomic practices and land resource management. He has worked with academic, industry and landowner/government leadership.

He is an expert in land resource (soils) information, soil microbiology, wildlife botany and current agricultural land use and management practices and their relationship to environmental issues. His work includes assessments of the impacts of applied microbiology in degradation of polluted soils, nutrients, organic materials and greenhouse gas emissions.

Currently, Dr. Khalvati is a visiting scientist in the Turkish-American University (Bosphorous University) in Istanbul where, in addition to teaching, he is leading a project involving the bioremediation of mining activities and rehabilitation of contaminated lands caused by mine tailings and also a separate project: bio-recovery of the earth rare metals from electronical waste (e-waste). In this research two contaminated sites have been selected such as an abandoned mine in the central Anatolia region and a landfill site in Istanbul, Turkey. This project has been funded by The Scientific and Technological Research Council of Turkey (TUBITAK) since January 2015. (2015-2016)

Dr. Khalvati obtained his PhD at the Technical University of Munich and post-doctoral experience at the German Research Center for Environmental Health. His supervisor, Professor Dr. Peter Schroeder is a world class phytoremediation scientist. (2002-2010) Dr. Khalvati worked with him on the following projects:

- Germany - Recovery of degraded land by restoration of exposed soils. A European collaborative research project with 8 members states including Germany. This study aimed to assist in harmonizing the methodologies for identification of specific soil degradation status and plan awareness training for contractors, field crews and equipment monitors.
- Southern Europe - Mitigation of desertification potential in arid soils of Southern Europe. To plan and implement projects related to industrial, open pit mines, and landfilled waste areas using phyto-remediation, myco-bioremediation and fast track species techniques to remove pollutants.
- East Europe - Using microsymbiont glomalin to understand and alleviate the environmental stress response on natural East European grasslands in the context of global climate change conditions global change conditions: to perform soil erosion control methods by providing soil glomaline to aggregate soil particles, using beneficial fungus against soil erosion
- Ghana, West Africa - Microbial diversity as a phytoremediation technology for the treatment of contaminated sites in Ghana. To identify environmental concerns, optimize and lower costs.

In 2010, he volunteered with the Algonquin Woodland Métis Anishinabek Tribe in Northern Ontario to put long term environmental sustainability in the hands of the community itself. This experience included extensive work with local farmers and youth. He lived in Minden-Haliburton County and organized workshops in modern environment microbiology studies, research systems and soil erosion. (2010-2011)

M. ALI KHALVATI, PH. D.

As the head of the Energy and Environmental Health section at AMA Holding Corp in Toronto, Ontario (Canada), Ali developed a framework for international and national networks integrating the academic world, and aboriginal forest and agricultural researchers, and development. (2011-2013)

Dr. Khalvati has led research projects in land use, management and environmental sustainability between Queens' University (Kingston, Ontario, Canada) and a mining company to address soil contaminated with mine tailings on gold mine tailings in Ghana. He has followed up this research with Turkey's Bogazici University to remediate mine sites in southern Turkey. (2013-2014)

He also worked as a research associate in the Department of Biology at Queen's University in Kingston, Ontario. (2013-2014) His research included:

- Terrestrial ecology,
- Ecophysiology,
- Environmental toxicology, and
- Myco-remediation of contaminated soil and wastewater.

While at Queen's Department of Biology, he was the principal applicant and co-applicant of several successful NSERC grants and International Grants (Canadian-African Research Exchange Grant, CAREG), as well as industrial grants in the field of bioremediation. These funds are currently subsidizing attempts to identify soil microbe's genomes and apply indigenous soil microorganism to re-vegetate abandoned and highly contaminated mine sites in central Ontario. This project is tremendously important for Ontario's Ministry of Northern Development and Mines. (2013-2014)

One of the NSERC projects included working with McIntosh Perry Consulting Engineers Ltd., a Kingston-based company where he conducted extensive soil and plant sampling at the Kam Kotia mine site (Ontario). The team also tested the growth and potential for recovery of native plants using their commercial forms. Results indicate that several beneficial soil microorganisms are able to exist despite the harsh acidic soil conditions bringing considerable hope for biological re-vegetation for this site. (2013-2014)

M. ALI KHALVATI, PH. D.

EDUCATION

Doctor of Philosophy in Natural Science, Technical University of Munich, Germany	2001-2005
Master of Sciences in Applied Sciences, EGE University, Izmir, Republic of Turkey	1998-2001
Bachelor of Science in Agricultural Engineering, Azad University of Tabriz, Iran	1990-1994

PROFESSIONAL HISTORY

VISITING SCIENTIST

Institute of Environmental Science, Bogazici (Bosphorous) University, Istanbul, Turkey 2015

Leading Projects

- TUBITAK, The Scientific and Technological Research Council of Turkey Grant Bioremediation (Plant-Microbe Interactions) Technology for Bioleaching Heavy Metals Contamination of Surface. Soil in Industrial Area.
- BAP- Bogazici University`s Scientific Fund Evaluation of Phyto-remediation Technology for Bioleaching and Recovery of Metals and Rare Earth Materials from Waste of Electrical and Electronic Equipment.

RESEARCH ASSOCIATE

Department of Biology, Queen`s University, Kingston, Ontario, CAN 2013-2014

Projects

1. Application of myco-bioremediation technology to improve native plants, rhizosphere, and possible re-vegetation of Kamkotia Abandoned Mine Tailings, Timmins Ontario, Canada (NSERC grant)
2. Facilitating Aseptic Mass Production and Sporulation of Soil Microorganisms to Detoxify Soil Contamination (NSERC grant)
3. Promoting applied knowledge and management of Bio-Phytoremediation as a new biotechnology tool to alleviate environmental stress of West African mine tailings (Canada-Africa Researchers Exchange Grant)

Project Consultant and Environmental Specialist, Toronto, ON, CAN 2011-2013
AMA Holding Corp. Green Energy and Environmental Health Division

1. De-mining, soil degradation prevention. Agricultural soil improvement of the Republic of Turkey-Syria border
2. Ontario contamination sites monitoring, Minden Haliburton County

Research Associate, Minden, ON, CAN 2010-2011
MISI-ATIM Corporation, Aaniish Resources,
Environmental and economic sustainability of an Ontario First Nations community

M. ALI KHALVATI, PH. D.

Environmental Scientist / Project Manager, Munich, Germany
German Research Center for Environmental Health

2006-2010

1. Recovery of degraded land by restoration of exposed soils to organic pollutions
2. Mitigation of desertification potentials in arid soils of Southern Europe and West Africa
3. Microsymbiont glomalin. A new tool to understand and alleviate environmental stress response on natural of East European grassland among global warming conditions.

CITIZENSHIP - Canadian

LANGUAGES - English, German, Turkish, Farsi, Azarbayjanian

PUBLICATIONS
M. ALI KHALVATI, PH. D.

ARTICLES

1. Tunali MM, **Khalvati, MA**, Onay, TT and Yenigun O. (2016) Microbial Association in Plant Rhizosphere Supporting Phytoremediation of Copper Contaminated Soils. *Chemosphere* (in review).
2. **Khalvati, M.A. and Schroder P. (201X)** Phosphorus recovery from P-enriched soils by novel rhizospheric and proteomic technologies for mitigating environmental pollution risks. *Environmental Science and Pollution Research* (ESPR- in review)
3. Aliabadi Farahani, H. Valadabadi, SAR. Daneshian, J. Shiranirad, AH. and **Khalvati M.A** (2013) Medicinal and aromatic plants farming under drought conditions (review paper) *African Journal of Plant Breeding* Vol. 1 (5), pp. 083-088.
4. **Khalvati MA**, Fulton Y, Bell Z, and Metatawabin MJ (2011) Traditional Ecological Knowledge Impact on Commercial Health. *Journal of Commercial Biotechnology*: 17, 131 – 133.
5. **Khalvati, MA** Bartha B. and Schroeder P (2010) Arbuscular mycorrhizal fungal association on growth yield and detoxify xenobiotic of barley under drought stress. *Journal of Soils and Sediments* 10:54-64.
6. Schwitzguébel JP, Elena Comino, Nadia Plata, **M. Ali Khalvai** (2011) Is phytoremediation a sustainable and reliable approach to clean-up contaminated water and soil in Alpine countries? *Environmental Science and Pollution Research* (ESPR) V:18-6, 842-856.
7. Ruth B, **Khalvati, MA** and Schmidhalter U (2011) Quantification of Water Flow through Hyphae of Mycorrhizal Plants Measured by Capacitance Sensors for Soil Water Content. *Plant and Soil* Volume 342, Numbers 1-2, 459-468.
8. Aliabadi Farahani H, Valadabadi A, Daneshian J and **Khalvati MA** (2009) Evaluation changing of essential oil of balm (*Melissa officinalis* L.) in water deficit stress conditions. *Journal of Medicinal Plants Research*, Volume 3(5), 329-333.
9. Aliabadi Farahani H, Valadabadi SAR, Daneshian J, Shiranirad AH and **Khalvati MA** (2009) Medicinal and aromatic plants farming under drought conditions. *Journal of Horticulture and Forestry* Vol. 1(6) 86-92.
10. Valadabadi SA, Aliabadi Farahani H and **Khalvati MA** (2009) Interactive effects of P supply and drought on root growth of the mycorrhizal coriander (*Coriandrum sativum* L.) *Journal of Plant Breeding and Crop Science* Vol. 1(5), 217-222.
11. Valadabadi SA, Aliabadi Farahani H and **Khalvati MA** (2009) Evaluation of grain growth of corn and sorghum under K₂O application and irrigation according. *Asian Journal of Agricultural Science* Vol. 1(1), 19-24.
12. Schroeder P, **Khalvati MA** and Stampf A (2009) Role of mycorrhizal fungi to detoxify xenobiotics conjugate in barley (COST-ACTION 859 Conferences, *European Research Commissions*, Szeged, Hungary, pp.21.
13. **Khalvati MA** and Schroeder P. (2008) Interaction effects of Glomus and xenobiotic glutathione conjugate on the detoxification enzymes of the mycorrhizal roots in barley. Genes and proteins involved in steps of phytoextraction and degradation of pollutants (European Research Commissions, 7th Framework programme-COST-ACTION 859, Verona, Italy) pp. 57.

PUBLICATIONS
M. ALI KHALVATI, PH. D.

14. Sima NAK., **Khalvati, MA** Hu Y (2008) Response of plant growth to different salinization in root zone *Journal of Plant Nutrition* 31 (3), 411-425
15. **Khalvati M.A.**, Hu Y., Mozafar A. and Schmidhalter U. (2005). Quantification of water uptake by mycorrhizal hyphae and its significance for leaf growth, water relations and gas exchange of barley subjected to drought stress. *Plant Biology* 7, 706-712.
16. **Khalvati M.A.**, Avcioglu R. and Damiroglu G. (2001). Effect of different salt concentrations on the resistance of maize cultivars - Some morphological and yield characteristic in early growth. *Turkish Journal of Field Crops* 6, 49-54.
17. Damiroglu G, **Khalvati M.A** and Avcioglu R. and (2001). Effect of different salt concentrations on the resistance of maize cultivars -Some physiological characteristics and ion accumulation in early growth. *Turkish Journal of Field Crops* 6, 55-60.

BOOK CHAPTERS

1. **Khalvati MA** and Dincer I (2013) Environmental Impact of Soil Microorganisms on Global Change. ed: Ibrahim Dincer, C.Ozgun Colpan and Fethi Kadioglu: Causes, Impacts and Solutions to Global Warming Springer- publish Berlin Heidelberg New York. pp. 233-250.
2. Solouki T, **Khalvati MA** Miladi M and Zekavat B (2011) State-of-the-art Chemical Analysis of Xenobiotics and Residues in Plant Based Products. ed: Peter Schroeder: Organic Xenobiotics and Plants: from Mode of Action to Ecophysiology Author: Peter Schroeder 2011, Volume 8, Part 3, 261-306, DOI: 10.1007/978-90-481-9852-8_12 . Springer-Verlag Berlin Heidelberg New York.
3. Schroeder, P. **Khalvati, M.A.** Neustifter, J. and Gschlöbl T. (2008) Use of *Phragmites australis* for Phytoremediation of organic compounds in municipal waste water treatment plants. Ed: J.P. Navarro-Avino: Phytoremediation: The Green Salvation of the World, chapter 1, Springer-Verlag Berlin Heidelberg New York, pp. 231-242.
4. **Khalvati M.A.**, Hu Y., and Schmidhalter U. (2004) Contribution of mycorrhizal hyphae to water uptake and leaf elongation of barley during well-watered and drought condition. 14. Borkheider Seminar zur Ökophysiologie des Wurzelraumes, Hrsg.: W. Merbach, K. Egle, J. Augustin B.G. Teubner *Stuttgart* Leibzig, Wisbaden pp. 43-49.

PRESENTATIONS & PUBLICATIONS TO INTERNATIONAL CONFERENCES

1. Bioremediation (Plant-Microbe Interactions) Technology for Bioleaching Heavy Metals Contamination of Surface Soil in Industrial Area. *12th International Phytotechnology Conference* Sept 7-11, 2015 Kansas, USA (Accepted as Poster Presentation)
2. Microbes Contributing Energy Crops For Growth in Disturbed Lands (Drought, Salinity and Contaminated Soil) using for Bioenergy *Growing the Margins Conference and Exhibition* March 7-10, 2009 London Ontario Canada (Oral Presentation)
3. Interaction effects of Glomus and xenobiotic glutathione conjugate on the detoxification enzymes of the mycorrhizal roots in barley. Genes and proteins involved in steps of phytoextraction and degradation of pollutants In: COST Action 859 – WG1 & WG2 Workshop and MC Meeting Uptake, sequestration and detoxification – An integrated approach, Szeged, Hungary, April 2009 (Oral Presentation)
4. Arbuscular mycorrhizal fungal association on detoxify xenobiotic of barley under paracetamol substrate. *Plant-Microbial Interactions* 2008, July 2-6, 2008, Krakow, Poland (Oral Presentation)

PUBLICATIONS
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5. Contribution of mycorrhizal hyphae to water uptake and leaf elongation of barley during well-watered and drought condition. 14. Borkheider Seminar zur Ökophysiologie des Wurzelraumes, Postdam, Berlin Germany 2003 (Oral Presentation).