Walid M. Fouad

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Positions

2017 - Present	Associate Professor, Department of Biology, School of Sciences and Engineering, The American University in Cairo, Egypt.
2010 - 2017	Assistant Professor, Department of Biology, School of Sciences and Engineering, The American University in Cairo, Egypt.
2005 - 2010	Postdoctoral Associate, Laboratory of Molecular Plant Physiology, Agronomy Department University of Florida, Gainesville, Florida, USA.
2007 - 2010	Research Scientist, Agriculture Genetic Engineering Research Institute (AGERI), Agriculture Research Center (ARC), Giza, Egypt.
2000 - 2004	Graduate Research Assistant, Ph.D. candidate, Horticultural Sciences Department, University of Florida.
1998 - 2007	AGERI, ARC, Giza, Egypt.
1994 - 1998	AGERI, ARC, Giza, Egypt, Cairo, Egypt.

Education

2004	Ph.D.	University of Florida, Gainesville, Florida, USA
1998	M. Sc.	Cairo University, Cairo, Egypt
1993	B.Sc.	Cairo University, Cairo, Egypt

Research Interest

My research interest focuses on biotechnological applications to safeguard sustainable development. Ongoing projects:

- Molecular improvement of forage crops for high nutritional quality.
- Improving soil productivity by integrating plant growth promoting microorganisms with natural mineral sources into agriculture production systems.
- Enhancement of plant productivity and persistence under harsh environmental conditions.
- Studying and taping on algae biodiversity and its downstream applications.

Research Grant Projects (funded):

1. Optimizing Phosphorus Fertilization using Rock Phosphate and Phosphate Solubilizing Microorganisms (PSMs), 2023-2024; $30,000; The Bartlett Fund for Critical Challenges, The American University in Cairo. PI: W. Fouad.
2. Integration of Strategic Crops Production with Improved Farming Practices to Target Sustainable Food Production and Circular Bioeconomy in Rural Communities. 2023-2024; $30,000; The AUC Climate Change Initiative, The American University in Cairo. Co-PI: W. Fouad
3. Improving Biomass Production and Quality of two Summer Forage Crops, Millet and Sweet Sorghum. 2022-2024; $30,000; The American University in Cairo. PI: W. Fouad.
4. Toward Molecular Improvement of Sorghum: Establishment of Robust Regeneration and Genetic Transformation System for Egyptian Sorghum Inbred Lines. 2019-2021; $20,000; The American University in Cairo. PI: W. Fouad.

5. Molecular Characterization of Transgenic Bahiagrass Expressing Regulatory and Structural Genes Conferring Freezing and Chilling Tolerances. 2012-2014; $4,657; The American University in Cairo. PI: W. Fouad.
6. Genetic engineering of sugarcane for increased fermentable sugar yields from hemicellulose biomass. 2008-2011; $866,576; USDA-CSREES; PI: F. Altpeter.
7. Development of a chloroplast transformation protocol for energycane, 2008-2009; $140,000; CPBR; PI: F. Altpeter.
8. Chloroplast engineering of sugarcane to enhance biomass conversion to bioenergy; 2007-2009; $87,689. University of Florida 2007 Research Opportunity Incentive Seed Fund; PI: F. Altpeter.
9. Chloroplast Engineering for Xylanase Enzyme Production. 2006-2007; $10,000 School of Natural Resources and Environment University of Florida - IFAS. PI: F. Altpeter.
10. Chloroplast engineering for production of cell wall degrading enzymes. 2006-2008; $100,000 The Consortium for Plant Biotechnology Research, Inc (CPBR). PI: F. Altpeter.
11. Molecular improvement of forage and turf quality in bahiagrass. 2006-2008; $198,600; USDA-CSREES; PI: F. Altpeter.

List of publications:

1. Abushal LT, Assem SK, Fouad WM. Development of an efficient indirect somatic embryogenesis and shoot regeneration system for sweet sorghum cultivars using immature inflorescence. *In Vitro Cellular and Developmental Biology - Plant.* (2025). https://doi.org/10.1007/s11627-024-10496-z
2. Badr AA, Fouad WM. (2023) Comparative study of multiple approaches for identifying cultivable microalgae population diversity from freshwater samples. *PLoS ONE* 18(7): e0285913. https://doi.org/10.1371/journal.pone.0285913.
3. Assem SK, Basry MA, Taha TA, El-Aziz MHA, Alwa T, Fouad WM. (2023) Development of an in vitro regeneration system from immature inflorescences and CRISPR/Cas9-mediated gene editing in sudangrass. *J Genet Eng Biotechnol.* 2023 May 15;21(1):58. doi: 10.1186/s43141-023-00517-6. PMID: 37184575; PMCID: PMC10185720.
4. Kimera F, Sewilam H, Fouad WM, Suloma S. (2021) Efficient utilization of aquaculture effluents to maximize plant growth, yield, and essential oils composition of Origanum majorana cultivation. *Annals of Agricultural Sciences 66 (1), 1-7*
5. Badr AA and Fouad WM (2021) Identification of Culturable Microalgae Diversity in The River Nile in Egypt using Enrichment Media. *African Journal of Biological Sciences. 3 (4), 50-64*
6. Kimera F, Sewilam H, Fouad WM, Suloma S. (2021) Sustainable Production of Origanum syriacum L. using Fish Effluents improved Plant Growth, Yield, and Essential Oil Composition. *Heliyon 7 (3), e06423*.
7. Badiea EA, Sayed AA, Maged M, Fouad WM, Said MM, and Esmat AY. (2019). A novel thermostable and halophilic thioredoxin reductase from the Red Sea Atlantis II hot brine pool. *PLoS ONE* 14(5): e0217565. https://doi.org/10.1371/ journal.pone.0217565
8. Fouad WM, Hao W, Xiong Y, Steeves S, Sandhu SK, and Altpeter F. (2015) Generation of Transgenic Energy Cane Plants with Integration of Minimal Transgene Expression Cassette. *Current Pharmaceutical Biotechnology* 16(5):407-13.
9. Haider AS, Fouad WM, Badawi MA, and Soliman MA. (2013). Variability of morphological characters, protein patterns and random amplified polymorphic DNA (RAPD) markers in some Pisum genotypes. *African Journal of Agricultural Research*, 8(17), 1608-1616.
10. Jung JH, Fouad WM, Vermerris W, Gallo M, Altpeter F. (2012) RNAi suppression of

lignin biosynthesis in sugarcane reduces recalcitrance for biofuel production from lignocellulosic biomass. *Plant Biotechnol J*. 10(9):1067-76

11. Taparia Y, Fouad WM, Gallo M and Altpeter F. (2012) Rapid production of transgenic sugarcane with the introduction of simple loci following biolistic transfer of a minimal expression cassette and direct embryogenesis. *In Vitro Cellular and Developmental Biology - Plant. 48*(1):15-22.
12. Kim J Y, Kavas M, Fouad WM, Nong G, Preston JF, and Altpeter A. (2011) Production of hyperthermostable GH10 xylanase Xyl10B from Thermotoga maritima in transplastomic plants enables complete hydrolysis of methylglucuronoxylan to fermentable sugars for biofuel production. *Plant Molecular Biology*; 76:357-69.
13. Fouad WM and Altpeter F. (2009) Transplastomic expression of bacterial L-aspartate-alpha-decarboxylase enhances photosynthesis and biomass production in response to high temperature stress. *Transgenic Res*. 18(5):707-718.
14. Fouad WM and Rathinasabapathi B. (2006). Heterologous expression of Escherichia coli L-aspartate-β-decarboxylase in tobacco increase β-alanine levels and improves vegetative growth and thermotolerance. *Plant Molecular Biology*, 60:495-505.

Book chapter:

15. Badr AA and Fouad WM. 'Unlocking the Richness of Microalgae Biodiversity for Potential Applications'. Microalgae - Current and Potential Applications [Working Title], IntechOpen, 25 Aug. 2023. Crossref, doi:10.5772/intechopen.1002319.

Submitted for publication and under review:

- Mugwanya M, Assem, SK, Fouad WM. Assessment of Forage Quality and Yield Between the Sudangrasses and Sweet Sorghum Varieties at Different Cutting Time Points. (Animal Feed Science and Technology).
- Youssef A, Badr AA and Fouad WM. Agronomic Impact and Cost Analysis of Natural Rocks and Biological Inoculants in Potato Production. (Agronomy for Sustainable Development)

In Preparation:

- Joseph Boctora J, Badiea EA, Fouad WM. Plastivore: Identification of plastic degrading Enzymes from Galleria mellonella and revealing conserved motifs repurposing.
- Youssef A and Fouad WM. Optimizing Phosphorus Fertilization in sorghum using Rock Phosphate and Phosphate Solubilizing Microorganisms (PSMs).

Patents:

- Boctor J.N. and Fouad W.M. (2023) Metnods for Degradation and Decomposing Plastics Using Enzymes Expressed by Lepidoptera. PROVISIONAL APPLICATION 63467751 (May 19, 2023).
- Altpeter F., Fouad W.M., Gallo, M., Jung J.H., Xiong Y. (2015) Isolation and targeted suppression of lignin biosynthetic genes. *United States Patent* US 9,187,757, Date of Patent Nov. 17, 2015.
- Rathinasabapathi, B., Fouad, W.M (2014) Enhanced Stress Tolerance and Enhanced Yield in Plants. *United States Patent US 8,748,696 B2*; Date of Patent Jun. 10, 2014.