

Dr. Marwa Talaat Kamel Refaat El-Mahdy

Associate Professor of Pomology (Plant Biotechnology)

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Professional Profile

Associate Professor of Pomology with expertise in plant tissue culture, plant biotechnology, and abiotic stress physiology. My research focuses on developing in vitro propagation systems and integrating physiological, biochemical, and molecular approaches to improve horticultural crops under biotic and abiotic stresses. My work encompasses micropropagation, genetic transformation, germplasm conservation, and stress physiology of fruit crops. I have international research experience through research appointments at Purdue University, USA, and currently serve as Director of the Genetic Engineering and Plant Tissue Culture Unit at Assiut University.

Education

Doctor of Philosophy (Ph.D.) in Pomology (Biotechnology)

Assiut University, Egypt | 2016

Dissertation: *Producing Genetically Modified Grapevines for Tolerance to High Temperature*

Master of Science (M.Sc.) in Pomology (Biotechnology)

Assiut University, Egypt | 2009

Thesis: *In Vitro Propagation of Some Pomegranate Cultivars*

Bachelor of Science (B.Sc.) in Horticulture

Assiut University, Egypt | 2004

Academic Appointments

2023–Present**Director, Genetic Engineering and Plant Tissue Culture Unit**

Molecular Biology Research & Studies Institute, Assiut University, Egypt

2022–Present**Associate Professor**

Department of Pomology, Faculty of Agriculture, Assiut University, Egypt

2018–2021**Postdoctoral Researcher**

Department of Horticulture and Landscape Architecture, Purdue University, Indiana, USA

2016–2022**Assistant Professor**

Department of Pomology, Faculty of Agriculture, Assiut University, Egypt

2012–2014**Research Scholar**

Department of Horticulture and Landscape Architecture, Purdue University, Indiana, USA

2009–2016**Assistant Lecturer**

Department of Pomology, Faculty of Agriculture, Assiut University, Egypt

2004–2009**Demonstrator**

Department of Pomology, Faculty of Agriculture, Assiut University, Egypt

Administrative and Academic Service

- Director, Genetic Engineering and Plant Tissue Culture Unit, Molecular Biology Research & Studies Institute, Assiut University (2023–Present)
- Director of Community Service and Environmental Development Affairs, Strategic Planning Subcommittee, Faculty of Agriculture, Assiut University (2024–Present)
- Coordinator of Foreign Student Affairs Committee, Faculty of Agriculture Representative, Assiut University (2023–Present)
- Member, Strategic Planning Committee, Faculty of Agriculture, Assiut University (2024–Present)
- Member, Applied Biotechnology Department Council, Molecular Biology Research & Studies Institute, Assiut University (2023–Present)
- Member, Scientific Research Ethics Committee, Faculty of Agriculture, Assiut University (2025–Present)
- Editorial Board Member, *Assiut Journal of Agricultural Sciences* (2025–Present)

Research Grants and Fellowships

Postdoctoral Fellowship (2018–2021)

Funding Agency: Science, Technology & Innovation Funding Authority (STDF), Egypt

Host Institution: Purdue University, USA

Project: *Improving Drought Tolerance of Tomato Using CRISPR Technology*

Joint Supervision Scholarship (2012–2014)

Funding Agency: Ministry of Higher Education, Egypt

Host Institution: Purdue University, USA

Project: *Producing Genetically Modified Grapevines for Tolerance to High Temperature*

Career Development Activities

Career Development Specialist

Career Development Center, Assiut University (Guided by The American University in Cairo and USAID)
2022–2025

Responsibilities included:

- Delivered more than **30** career development workshops serving over **500** university students.
- Conducted more than **60** individual career advising sessions.
- Developed training materials covering CV writing, interview skills, career planning, and job search strategies.
- Guided students in identifying strengths, transferable skills, and career interests through structured assessments and coaching.

Professional Certifications

- Facilitating Career Development Training, The American University in Cairo (2024)
- Certified Professional Trainer, American Chamber of Commerce in Egypt (2023)

Editorial Activities

- Editorial Board Member, *Assiut Journal of Agricultural Sciences* (2025–Present)

Journal Reviewer

Reviewer for:

- Frontiers in Plant Science

- BMC Plant Biology
- Plant Physiology and Biochemistry
- Scientific Reports
- BioMetals
- Acta Physiologia Plantarum
- Circular Agricultural Systems
- Journal of Applied Molecular Biology

Workshops and Professional Training

Coordinator and Trainer

- Coordinator and trainer of the training workshop “**Fundamentals of Plant Tissue Culture**”, organized by Genetic Engineering and Plant Tissue Culture Unit, Molecular Biology Research & Studies Institute, Assiut University, 17-10 April 2026.
- Trainer of the workshop “**Scientific Publishing**”, organized by Molecular Biology Research & Studies Institute, Assiut University, 13-15 October 2025.
- Coordinator of the training workshop “**Mycotoxins, Impacts, Analysis Methods and Controlling Strategies**”, organized by Genetic Engineering and Plant Tissue Culture Unit, Molecular Biology Research & Studies Institute, Assiut University, 24-26 November 2025.
- Coordinator and trainer of the training workshop “**Fundamentals of Plant Tissue Culture, Somaclonal Variations, Induction and Application**”, organized by Genetic Engineering and Plant Tissue Culture Unit, Molecular Biology Research & Studies Institute, Assiut University, 15-17 April 2025.
- Coordinator and trainer in the training workshop “**Basics of Plant Tissue Culture**”, organized by Genetic Engineering and Plant Tissue Culture Unit, Molecular Biology Research & Studies Institute, Assiut University, 5-7 March 2024.
- Trainer in the training workshop “**Plant Tissue Culture, Basics and Applications**”, organized by Central Laboratories, Faculty of Agriculture, Assiut University, 5-7 March 2022.

Publications

Journal Articles

- Shaaban M. M., Sameeaa, A. A., & **El-Mahdy, M. T. (2026)**. Thiamine and Salicylic Acid Ameliorate Drought Stress in Three Citrus Rootstocks: *In Vitro* Study. *Russian Journal of Plant Physiology*, 37(1), 34.
- Mohammed, H. A. H., **El-Mahdy, M. T.**, & Youssef, M. (2026). Optimizing In vitro Propagation of Jojoba (*Simmondsia chinensis*) Using Plant Growth Regulators. *Journal of Applied Molecular Biology*, 4(1), 78-85.
- El-Mahdy, M. T.**, Abulfadl, E. A., & Dawood, M. F. (2025). Aluminum and copper oxide nanoparticles alter secondary metabolites, antioxidants, and biochemical markers in key lime: *in vitro* approach. *BMC Plant Biology*.

- Abeed, A. H., **El-Mahdy, M. T.**, Hameed, F. A. Z. H. A., Abdel-Fatah, B. E., & Mahmoud, G. A. E. (2025). Biological Gibberellin Instigated Phytoremediation of Diclofenac by *Atriplex lentiformis*. *Plant Physiology and Biochemistry*, 110842.
- Hamed, H. A., **El-Mahdy, M. T.**, & Abeed, A. H. (2025). Melatonin upregulates photosynthesis, carbohydrate and nitrogen metabolism, and antioxidant system under aluminum stress: a sustainable path to higher strawberry yield and quality. *Physiology and Molecular Biology of Plants*, 31(11), 1979-2003.
- Abdel Sameea, A., Shaaban, M. M., & **El-Mahdy, M. T.** (2025). Impact of PEG Induced Drought Stress on Three Citrus Rootstocks. *Assiut Journal of Agricultural Sciences*, 311-320.
- El-Mahdy, M. T.**, Abdel-Wahab, D. A., & Elazab, D. S. (2025). Fourier-transform infrared spectroscopy detects changes in macromolecules of banana (*Musa* spp.) in vitro under cadmium toxicity, modulated by iron and zinc application. *Acta Physiologiae Plantarum*, 47(4), 1-16.
- Hamed, H. A., Abeed, A. H., Geioushy, R. A., Fouad, O. A., & **El-Mahdy, M. T.** (2025). Innovative auxin-micronutrient based nanocomposites (IAA-Fe₂O₃NPs and IAA-Mn₂O₃NPs) shield strawberry plants from lead toxicity. *Plant Physiology and Biochemistry*, 219, 109429.
- El-Mahdy, M. T.**, Ali, M., Pisam, W. M., & Abeed, A. H. (2024). Physiological and Molecular Analysis of Pitaya (*Hylocereus polyrhizus*) Reveal Up-regulation of Secondary Metabolites, Nitric oxide, Antioxidant Defense System, and Expression of Responsive Genes under Low-temperature Stress by the pre-treatment of Hydrogen Peroxide. *Plant Physiology and Biochemistry*, 108840.
- Elazab, D. S., **El-Mahdy, M.**, Youssef, M., Eissa, M. A., Amro, A., & Lambardi, M. (2023). Assessment of Salicylic Acid as a Pretreatment on Alleviating Cadmium Toxicity on In Vitro Banana Shoots. *Journal of Plant Growth Regulation*, 42(9), 5700-5712.
- Abeed, A. H., Al-Huqail, A. A., Albalawi, S., Alghamdi, S. A., Ali, B., Alghanem, S. M., ... & **El-Mahdy, M. T.** (2023). Calcium nanoparticles mitigate severe salt stress in *Solanum lycopersicon* by instigating the antioxidant defense system and renovating the protein profile. *South African Journal of Botany*, 161, 36–52.
- Abeed, A. H., Tammam, S. A., & **El-Mahdy, M. T.** (2022). Hydrogen peroxide pretreatment assisted phytoremediation of sodium dodecyl sulfate by *Juncus acutus* L. *BMC Plant Biology*, 22(1), 591.
- Elkady, E. M., **Elmahdy, M. T.**, Elakkad, M. M., & Mostafa, R. A. (2022). Effect of Spraying with Amino Acids, Yeast, and Some Plant Extracts on Fruiting of Sewi Date Palm. *Assiut Journal of Agricultural Sciences*, 53(4), 79–91.
- El-Mahdy, M.T.**, Youssef, M. & Elazab, D.S. (2022). In vitro screening for salinity tolerance in pomegranate (*Punica granatum* L.) by morphological and molecular characterization. *Acta Physiologiae Plantarum* 44, 27.
- Elazab, D. S., Ahmed, M. A. I., **El-Mahdy, M. T.**, & Amro, A. (2021). Citrus leafminer management: jasmonic acid versus efficient pesticides. *Journal of Plant Growth Regulation*, 40, 824–830.

- El-Mahdy, M.T.,** Abdel-Wahab, D.A. & Youssef, M. (2021). In vitro morpho- physiological performance and DNA stability of banana under cadmium and drought stresses. *In Vitro Cellular & Developmental Biology - Plant*, 57, 460–469.
- Elazab, D. S., Abdel-Wahab, D. A., & **El-Mahdy, M.T. (2021)**. Iron and zinc supplies mitigate cadmium toxicity in micropropagated banana (*Musa spp.*). *Plant Cell, Tissue and Organ Culture (PCTOC)*, 145, 367-377.
- Ibrahim, R. A., **EL- Mahdy, M. T.**, Taha, M. A. M. & Shaaban, M.M. (2021). Improving the quantitative and qualitative of Manfalouty pomegranate cultivar. *SVU- International Journal of Agricultural Sciences*, 3, 31–52.
- El-Mahdy, M. T.,** & Elazab, D.S. (2020). *Impact of zinc oxide nanoparticles on pomegranate growth under in vitro conditions. Russian Journal of Plant Physiology*, 67, 162–167.
- Mohamed, A. K. A., El-Salhy, A. M., Mostafa, R. A. A., **El-Mahdy, M. T.**, & Hussein, A. S. (2019). Effect of Exogenous Absciscic Acid (ABA), Gibberellic Acid (GA3) and Cluster Thinning on Yield of some Grape Cultivars. *Journal of Plant Production*, 101-105.
- El-Mahdy, M. T.,** & Youssef, M. (2019). Genetic homogeneity and high shoot proliferation in banana (*Musa acuminata* Colla) by altering medium thiamine level and sugar type. *In Vitro Cellular & Developmental Biology-Plant*, 55, 668–677.
- El-Mahdy, M. T.,** Radi, A. A., & Shaaban, M. M. (2019). Impacts of exposure of banana to silver nanoparticles and silver ions in vitro. *Middle East J Appl Sci*, 9(3), 727–740.
- El-Mahdy, M. T.,** Youssef, M., & Eissa, M. A. (2018). Impact of in vitro cold stress on two banana genotypes based on physio-biochemical Evaluation. *South African Journal of Botany*, 119, 219–225.
- Mostafa, F. M. A., Shaaban, M. M., Elazab, D. S., & **Kamel, M. T. (2015)**. In vitro propagation of four grape cultivars. *Assiut Journal of Agricultural Sciences*, 46, 1110–1148.
- El-Agamy, S. Z., Mostafa, R. A., Shaaban, M. M., & **El-Mahdy, M. T. (2010)**. In vitro salt and drought tolerance of Manfalouty and Nab El-Gamal pomegranate cultivars. *Australian Journal of Basic and Applied Sciences*, 4, 1076–1082.
- El-Agamy, S. Z., Mostafa, R. A., Shaaban, M. M., & **El-Mahdy, M. T. (2009)**. In vitro propagation of Manfalouty and Nab El-gamal pomegranate cultivars. *Research Journal of Agriculture and Biological Sciences*, 5, 1169–1175.

Book Chapters

- Hamed, H. A., **El-Mahdy, M. T.**, Dawood, M. F., Hindawy, M., & Usman, A. R. (2026). The ecological footprint of agricultural waste: Pollution and greenhouse gas. In *Waste to Resources* (pp. 101-120). Academic Press.

- Dawood, M. F., Hamed, H. A., & **El-Mahdy, M. T. (2025)**. Impact of Microplastics and Nanoplastics on Plant Health and Development. In *Microplastics Pollution: A Threat to Biosphere*(pp. 113-153). Cham: Springer Nature Switzerland.
- Jha, Y., Macwan, A., **El-Mahdy, M. T.**, Dawood, M. F., & Mohamed, H. I. (2025). Proteinaceous Elicitors: Keys to Unlocking Plant Defense Mechanisms. In *Elicitors for Sustainable Crop Production: Overcoming Biotic Stress Challenges in Plants* (pp. 275-296). Singapore: Springer Nature Singapore.
- El-Mahdy, M. T.**, Hamed, H. A., Mohamed, H. I., & Dawood, M. F. (2025). Rhizomicrobiome as potential agents used against polycyclic aromatic hydrocarbons contaminated soils for plants. In *Rhizomicrobiome in Sustainable Agriculture and Environment*(pp. 449-471). Academic Press.
- Jha, Y., Mohamed, H. I., **El-Mahdy, M. T.**, & Dawood, M. F. (2024). Jasmonic Acid: Application for Growth Improvement and Protection against Biotic Stress. In *Plant Growth Regulators to Manage Biotic and Abiotic Stress in Agroecosystems* (pp. 150-172). CRC Press.
- Dawood, M. F., Mohamed, H. I., Jha, Y., & **El-Mahdy, M. T. (2024)**. Karrikin Regulation of Biosynthesis, Hormonal Crosstalk, and Its Role In Biotic and Abiotic Stress Adaptation. In *Plant Growth Regulators to Manage Biotic and Abiotic Stress in Agroecosystems* (pp. 278-309). CRC Press.