Dr. Metha Meetam

Present Address

Department of Biology, Faculty of Science, Mahidol University

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Education

Post-doctoral Fellowship

2006 - 2008 Purdue University, Indiana, USA

Doctor of Philosophy in Horticulture

1999 - 2006 Purdue University, Indiana, USA

Bachelor of Arts in Biology (*magna cum laude*)

1995 - 1999 Washington University in St. Louis, Missouri, USA

Work Experiences

2017 – Present **Assistant Professor** Faculty of Science, Mahidol University, Thailand

2020 – Present **Chief Technologist** Advanced Greenfarm Co. Ltd., Thailand

2008 – 2017 **Lecturer** Faculty of Science, Mahidol University, Thailand

Honors & Awards

1991 - 2008 Development and Promotion of Science and Technology Talents Project (DPST) scholarship (Thailand)

Summer 1997 Howard Hughes Medical Institute summer research fellowship (Missouri, USA)

Academic & Professional Services

2016 - Present Program Director (M.Sc. Program in Environmental Biology), Mahidol University

2020 - 2021 Chair, Biosafety Committee, Faculty of Science, Mahidol University

2020 - 2021 Institutional Biosafety Committee, Mahidol University

Nov 2016 Session Chair (Physiology, Cultivation, Bioprocesses and Biotechnology), the 9th Asia-Pacific Conference on Algal Biotechnology (APCAB), Bangkok, Thailand

June 2015 Session Chair (Genetics, Molecular Biology, Cell Biology, Plant Physiology), the 9th Botanical Conference of Thailand, Bangkok, Thailand

June 2015 Session Co-Chair (Biotechnology, Bioinformatics, and Systems Biology), the 7th National Conference on Algae and Plankton, Bangkok, Thailand

Teaching Responsibilities

SCBI124	General Biology I
SCBI270	Basic Cell and Molecular Biology
SCBI373	Basic Techniques in Molecular Biology
SCBI319	Principles of Plant Physiology
SCBI434	Regulation of Gene Expression
SCBI584	Plant Responses to Environmental Stresses
SCBI582	Current Topics in Biology
SCBI582	Molecular Approach to Problems in Environmental Biology
SCBI609	Molecular Genetics
SCBI625	Bioremediation

Thesis Advisory

Current

Ms. Pitchaporn Darunsart (Ph.D. Biology)

Ms. Woranuch Bunnag (Ph.D. Biology)

Ms. Namkhang Saelee (Ph.D. Biology)

Graduated

Dr. Orathai Pakdee (Ph.D. Biology, graduated 2020)

Ms. Wipawadee Rattanpongchai (M.Sc. Environmental Biology, graduated 2019)

Mr. Sarawut Kongsattra (M.Sc. Environmental Biology, graduated 2018)

Ms. Woranuch Bunnag (M.Sc. Environmental Biology, graduated 2014)

Mr. Nuttapol Noirungsee (M.Sc. Environmental Biology, graduated 2014)

Ms. Pitchaporn Darunsart (M.Sc. Environmental Biology, graduated 2014)

Research Expertise

Algal biotechnology

Cellular response to stresses (drought, heavy metals, oxidative stress, and nutritional deficiency)

Duckweed biology

Environmental biology

Metal homeostasis

Molecular biology

Photosynthesis & Bioenergy

Plant biology

Plant nutrition

Precision agriculture

Rice genetics & Physiology

Research Grants

Oct 21 – Sep 22	Development of medium formula and environmental control for smart farming of economic crops for communities (10,575,000 THB, co-PI)
Oct 16 – Sep 18	Biodiesel production from algae - Phase II (800,000 THB)
Oct 16 – Sep 18	Effect of delayed leaf senescence and enhanced nutrient remobilizationon grain yield and nutritional quality of Thai rice cultivars (2,000,000 THB, co-PI)
Oct 16 – Sep 17	Plant materials for low-maintenance green roof to conserve energy and reduce carbon footprint (950,000 THB, co-PI)
Sep 15 – Nov 16	Examination of diffierences in ability and genetic basis of Thai rice cultivars in relation to phosphorus use eficiency (PUE) and phosphorus deficiency tolerance (PDT) (956,000 THB)
Jan 14 – Jan 17	Examination of metallothionein gene function and regulation mechanism in moss *Physcomitrella patens* (1,000,000 THB)
Oct 13 – Sep 14	Examination of cellular mechanisms that underlie increased cadmium toxicity and accumulation in copper-starved microalgae (424,000 THB)
Oct 13 – Sep 14	Capability of nitrification inhibition in field condition of native Thai rice varieties (1,808,290 THB, co-PI)
Jun 12 – Jul 14	Biodiesel production from microalgae (9,000,000 THB, co-PI)
Oct 09 - Sep 12	Biodiesel production from algae (4,500,000 THB, co-PI)
Jul 10 - Jun 12	Functional study of phytochelatin in cadmium detoxification in algae *Chlamydomonas reinhardtii* (480,000 THB)
Jan 10 - Jun 11	Biodiesel production from microalgae (4,900,000 THB, co-PI)
Oct 09 - Sep 10	Effect of salinity on growth and metabolism of freshwater alga *Chlorella vulgaris* (300,000 THB)
Feb 09 - Jan 10	Plant-based biosensor for heavy metal contamination (200,000 THB)

Publications

1. Pakdee O, Tshering S, Pokethitiyook P, **Meetam M** (2022) Examination of the metallothionein gene family in greater duckweed *Spirodela polyrhiza*. Plants (Basel) 12(1):125.
2. Khwankaew J, Bunnag W, Pichakum A, Songnuan W, Dhammasamisorn BO, Narawatthana S, Chotechuen S, Chamarerk V, **Meetam M** (2022) Differences in nutrient remobilization characteristics and relationship to senescence and grain nutrient content among rice varieties. Journal of Crop Science and Biotechnology 25(4), 407–419.
3. Promsing S, Pokethitiyook P, Kruatrachue M, Ounjai P, **Meetam M**, Onparn N, Kumsopa A (2021) Rhizoremediation of fuel oil by *Vetiveria zizanioides* in association with *Kocuria* sp. no. MU1 and *Micrococcus luteus* WN01. ScienceAsia 47: 96-105.

4. **Meetam M**, Sripintusorn N, Songnuan W, Siriwattanakul U, Pichakum A (2020) Assessment of physiological parameters to determine drought tolerance of plants for extensive green roof architecture in tropical areas. Urban Forestry & Urban Greening 56:126874.
5. Detpitthayanan S, Romyanon K, Songnuan W, **Meetam M**, Pichakum A (2019) Paclobutrazol application improves grain 2AP content of Thai jasmine rice KDML105 under low-salinity conditions. Journal of Crop Science and Biotechnology 22(3):275-282.
6. Pakdee O, Songnuan W, Panvisavas N, Pokethitiyook P, Yokthongwattana K, **Meetam M** (2019) Functional characterization of metallothionein-like genes from *Physcomitrella patens*: expression profiling, yeast heterologous expression, and disruption of PpMT1.2a gene. Planta 250(2):427-443.
7. Charoonnart P, Worakajit N, Zedler JAZ, **Meetam M**, Robinson C, Saksmerprome V (2019) Generation of microalga *Chlamydomonas reinhardtii* expressing shrimp antiviral dsRNA without supplementation of antibiotics. Scientific Reports 9(1):3164.
8. Pugkaew W, **Meetam M**, Ponpuak M, Yokthongwattana K, Pokethitiyook P (2018) Role of autophagy in triacylglycerol biosynthesis in *Chlamydomonas reinhardtii* revealed by chemical inducer and inhibitors. Journal of Applied Phycology 30(1):15-22.
9. Liu Y, Sanguanphun T, Yuan W, Cheng JJ, **Meetam M** (2017) The biological responses and metal phytoaccumulation of duckweed *Spirodela polyrhiza* to manganese and chromium. Environmental Science and Pollution Research 24(23):19104-19113.
10. Sooksawat N, **Meetam M**, Kruatrachue M, Pokethitiyook P, Inthorn D (2017) Performance of packed bed column using *Chara aculeolata* biomass for removal of Pb and Cd ions from wastewater. Journal of Environmental Science and Health, Part A. Toxic/Hazardous Substances and Environmental Engineering 52(6):539-546.
11. Sooksawat N, **Meetam M**, Kruatrachue M, Pokethitiyook P, Inthorn D (2016) Equilibrium and kinetic studies on biosorption potential of charophyte biomass to remove heavy metals from synthetic metal solution and municipal wastewater. Bioremediation Journal 20(3):240-251.
12. Sirikhachornkit A, Vuttipongchaikij S, Suttangkakul A, Yokthongwattana K, Juntawong P, Pokethitiyook P, Kangvansaichol K, **Meetam M** (2016) Increasing the triacylglycerol content in *Dunaliella tertiolecta* through isolation of starch-deficient mutants. Journal of Microbiolgy and Biotechnolgy 26(5): 854-866.
13. Somchai P, Jitrakorn S, Thitamadee S, **Meetam M**, Saksmerprome V (2016) Use of microalgae *Chlamydomonas reinhardtii* for production of double-stranded RNA against shrimp virus. Aquaculture Reports 3: 183-178.
14. Seepratoomrosh J, Pokethitiyook P, **Meetam M**, Yokthongwattana K, Yuan W, Pugkaew W, Kangvansaichol K (2016) The effect of light stress and other culture conditions on photoinhibition and growth of *Dunaliella tertiolecta*. Applied Biochemistry and Biotechnology 178(2): 396-407.
15. Chayapan P, Kruatrachue M, **Meetam M**, Pokethitiyook P (2016) Phytoremediation potential of Cd and Zn by wetland plants, *Colocasia esculenta* L. Schott., *Cyperus malaccensis* Lam. and *Typha angustifolia* L. grown in hydroponics. Journal of Environmental Biology 36(5): 1179-1183.
16. Chayapan P, Kruatrachue M, **Meetam M**, Pokethitiyook P (2015) Effects of amendments on growth and uptake of cd and zn by wetland plants, *Typha angustifolia* and *Colocasia esculenta* from contaminated sediments. International Journal of Phytoremediation 17(9): 900-906.
17. Benatti MR, Yookongkaew N, **Meetam M**, Guo WJ, Punyasuk N, Abu Qamar S, Goldsbrough P (2014) Metallothionein deficiency impacts copper accumulation and redistribution in leaves and seeds of Arabidopsis. New Phytologist 202(3):940-951.

18. Sooksawat N, **Meetam M**, Kruatrachue M, Pokethitiyook P, Nathalang K (2013) Phytoremediation potential of charophytes: Bioaccumulation and toxicity studies of cadmium, lead and zinc. Journal of Environmental Sciences 25(3) 596-604.
19. Chaichalerm S, Pokethitiyook P, Yuan W, **Meetam M**, Sritong K, Pugkaew W, Kungvansaichol K, Kruatrachue M, Damrongphol P (2012) Culture of microalgal strains isolated from natural habitats in Thailand in various enriched media. Applied Energy 89(1):296-302.
20. Guo WJ, **Meetam M**, Goldsbrough PB (2008) Specific contributions of individual metallothionein genes to copper distribution and metal tolerance. Plant Physiology 146(4): 1697-1706.
21. **Meetam M**, Keren N, Ohad I, Pakrasi HB (1999) The PsbY protein is not essential for oxygenic photosynthesis in the cyanobacterial *Synechocystis sp.* PCC 6803. Plant Physiology 121(4): 1267-1272.

Major Invited Seminars & Oral Presentations

1. **Meetam M** (2015) Productivity improvement of marine microalgal strains cultivated for biodiesel production, oral presentation given at the 7th National Conference on Algae and Plankton (Bangkok, Thailand)
2. **Meetam M** (2011) From plant physiology to algae biofuel, seminar given at Department of Botany, Faculty of Science, Chulalongkorn University (Bangkok Thailand)
3. **Meetam M**, Pokethitiyook P (2010) Biodiesel production from microalgae, oral presentation given at การประชุมวิชาการประเพณี มธ.-มม.-ทร.-มก. ครั้งที่ 13 (Bangkok, Thailand)
4. **Meetam M**, Pokethitiyook P (2010) Biodiesel production from microalgae, oral presentation given at National Science and Technology Development Agency (Pathum Thani, Thailand)
5. **Meetam M**, Goldsbrough PB (2009) DNA sequences that mediate copper response of the *MT2a* gene in *Arabidopsis thaliana*, oral presentation given at the 3rd Botanical Conference of Thailand (Bangkok, Thailand).