المجموعات البحثية

بقسم النبات والميكروبيولوجى

رئيس القسم

أ.د / ضياء الدين محمد رضوان

Research Laboratories

1. **Cell biology**
2. **Mycology**
3. **Physiology of Fungi**
4. **Plant physiology**
5. **Genetics**
6. **Plant Ecology**
7. **Bacteriology**
8. **Phycology**

Plant cell biology

Research interests.

- In this well-equipped laboratory, group members are immersed in the fundamentals of plant cell biology, mastering techniques such as pipetting, solution preparation, PCR, DNA and protein electrophoresis, specimen preparation for all types of macroscopic examination (Light, transmission and Scanning electron microscopy), plant cell and organ cultures, transformations, and more.
- They not only acquire proficiency in these methodologies but also apply them to research in basic science of cell structure and function (for example cellular biomineralization and crystal formation).
- Lab research activities also prepare graduates with experiences of production and evaluation of potentially valuable natural compounds. Another area of research interest in this laboratory is to examine, at the cellular and molecular level, the virus-induced diseases in some crop plants.
- Through hands-on experience gained in the lab, our graduates become highly sought-after by biotech industry firms and research laboratories, regularly receiving enticing job offers.

Group members

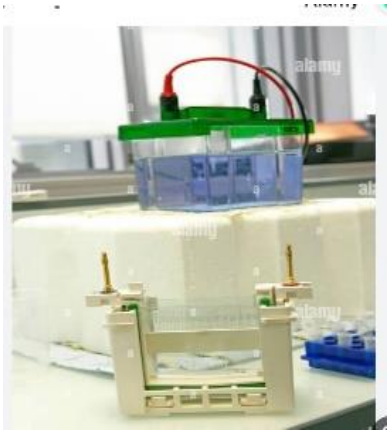
Group Member	Photo	Academic Rank	Area of interest	E-mail
Ahmed M. A. Mazen		Emeritus Professor	Structure-Function relationship of Plant cell	Amazen@science.sohag.edu.eg
Kermina Romany		Assistant	Virus-induced Plant diseases	karmina.romany@science.sohag.edu.eg
Rahma Ashraf		Assistant	Production of natural bioactive compounds from Plant cell and organ cultures	

Laboratory Facilities

Device	Device Photo	Device use
Hot air oven		Drying and hot air sterilization of glass and metal ware
Incubator:		used to provide controlled conditions (e.g. temperature, humidity, light) for growth of microorganisms

Hot plate with stirrer:		**used for heating samples and media**
Digital balance:		**weighting of chemicals and solid samples**
Electron balance:		**weighting of chemicals and solid samples**

Refrigerator:		**used for keeping samples at 0-4 °C.**
High speed Centrifuge:		**used for separation various components of a fluid**
Spectrophotometer		**: used to measure the intensity of a light beam at different wavelength**

Laminar air flow		**used for culturing of different microorganisms in sterilized conditions and in tissue culture**
Electrophoresis		**for protein separation**

Compound light-polarized Microscope :		**examination of crystals**
Water bath with shaker:		**used for mixing samples and heated it in indirect way.**

pH meter:		**measure the pH of media and solutions**

Collaboration with other external and internal entities

- **Faculty of Pharmacy**
- **Faculty of Agriculture**
- **National Agricultural Research Centers**
- **National industrial establishments**

Lab theses

Master Theses

- **Physiological studies on some aspects of bacterial pathogenesis in some plants (M. Sc 2006)**
- **Study of potential Impacts of Using Sewage Sludge in Amendment of Desert Reclaimed Soils on some Soil Properties and Physiological Aspects in Cultivated Plants. (M. Sc 2007)**
- **Physiological and ultrastructural studies on Calcium oxalate crystal formation in some plants (M. Sc 2008)**
- **Assesment of Physiological performance and growth of some crop Plants during biocontrol of their meal bug pest using entomopathogenic fngus, *Beuveria bassiana*. (M. Sc 2021)**
- **Study of ability of *Piriformospora indica* to improve productivity and salinity stress tolerance of some Egyptian medicinal and aromatic plants. (M. Sc 2021)**

Doctorate Theses

- **Study of Conditioning Effect of Hydrogels on Some Physical and Chemical Properties of Sandy Soil and Some Physiological Aspects in Cultivated Plants. (Ph.D 2011)**

- **Study of biodegradative ability of some bacteria isolated from Sohag soil on the insecticide *Lannate* (Ph.D 2012)**
- **Physiological studies on growth promotive and stress alleviatory effects of the endophytic fungus *Piriformospora indica* on some crop plants. (Ph.D 2015)**

Mycology

Research areas of interests

Isolate and identify fungi and fungi-like from different habitats, study their ecological roles, their systematic positions and their ability to produce secondary metabolites that have medical or commercial values.

Research activities:

- Isolation, identification and characterization of the ecological roles of aquatic fungi isolated from the River Nile, irrigation canals, fresh and saline lakes, Red Sea and Mediterranean seas.
- Isolate, identify and study the ecological roles of Thraustochytrids isolated from marine habitats in Egypt and study their abilities to produce value-added products.
- Study the taxonomy of fungi based on their morphology and DNA sequences of ribosomal and protein genes.
- Study the diversity of fungi based on metagenomics.
- Study the effect of pollution on fungal diversity.
- Isolates and identify bioactive compounds from fungi.
- Biodiesel production from raw materials using fungi.
- Isolate and identify fungi polluting vegetables, fruits and preserved food.
- Isolate and identify endophytic fungi of medicinal plants and study their abilities to produce bioactive compounds.
- Isolated and identify fungi deteriorating archaeology.
- The use of fungi in the bioremediation of wastes and pollutants.
- Participate in solving problems of factories in the Sohag governorate.
- Preserve isolated fungi in the department microbial culture collection.

Services provided by the laboratory.

- **Isolates and identify bioactive compounds from fungi.**
- **Participate in solving problems of factories in the Sohag governorate.**

Lab instruments

Device image	Description /use
	**Cryostat CM 1100 (Leica)**
	**Rotary Evaporator (Heidolph)**
	**Digital Ultra-Low Temp. Freezer (DAIHAN - Wise Cryo TM WUF-D)**
	**Stereomicroscope (Olympus SZ61)**

	**Olympus Microscope with Digital camera**

Staff members

	Name	Scientific degree	e-mail	Specializations
1	Mohamed Ahmed Abdel-Wahab Essa	Professor	mohamed.eisa@science.sohag.edu.eg mohamed700906@gmail.com	Marine Mycology
2	Faten Awad Abdel-Aziz Hassan	Professor	fatenabdel-aziz@science.sohag.edu.eg	Mycology
3	Mahmoud Saadeldin Bakhit	Lecturer	mahmoudsaad@science.sohag.edu.eg mahimoda@gmail.com	Mycology
Assistant Lecturers & Demonstrators				
1	Ali Ahmed Hussein Nourel-Din	Assistant Lecturer	ali_mazen@science.sohag.edu.eg ali_elmazny@yahoo.com	Mycology
2	Asmaa Fathy Mahmoud	Demonstrator	Asmaa.Fathy@science.sohag.edu.eg asmaafathy.5225@g.mail	Mycology

Institutions and entities benefiting from the laboratory

- **Faculty of medicine**
- **Faculty of pharmacy**
- **Faculty of science**
- **Agriculture and Archaeology**
- **Agricultural research center**
- **Factories**

Physiology of fungi

Our research plan encompasses a multidisciplinary approach, integrating molecular biology, biochemistry, bioinformatics, and biophysics to elucidate fundamental aspects of fungal physiology. Our primary focus is to understand the regulatory pathways governing fungal responses to environmental cues, such as nutrient availability, temperature fluctuations, and stress conditions.

We aim to uncover novel insights into fungal physiology at the cellular and molecular levels. Additionally, we are committed to applying our findings to address practical challenges in agriculture, industry, and medicine, with a particular emphasis on developing sustainable solutions for crop protection, biotechnology, and pharmaceutical production. By fostering collaborations and engaging with the broader scientific community, we strive to advance knowledge in fungal biology and contribute to the development of innovative strategies for addressing global challenges.

Research activities:

- Isolation and identification of fungal strains from various habitats in the environment. Extraction of bioactive compounds and providing their chemical identification.
- Molecular identification of important fugal isolates and deposition in the NCBI GenBank.
- Biosynthesis of gold nanoparticles using mine fungi and some of their applications
- Mycogenesis of silver nanoparticles using opportunistic fungi and their efficacy against human pathogenic microorganisms
- Microbiota and mycotoxins occurrence in some Egyptian fruit juices
- Biocontrol of some toxigenic fungi and their toxins formation

Services provided by the laboratory

- Biocontrol of Some Toxigenic Fungi and Their Toxins Formation

- Study the physiology of fungi and their applications

Lab instruments

Device image	Description /use
	**Electric balance NUL-TEC: Weight of different chemicals and others**
	**Centrifuge Centurion: Separation of different samples into two phases.**
	**Labconco Lypholyzer; Preserve microorganisms for nearly 3 years.**

	**Electric Straub Grinding Mill: To grind grains and seeds**
	**UV Lamp DESAGA: Detection of different mycotoxins**
	**Laminar flow clean bench: Culturing of different microorganisms in sterilized conditions**
	**pH meter EUTECH: Measurement and adjust of different pH of culturing media**
	**Oven Heraeus: Heat sterilization purposes and samples' drying.**

Staff members

#	Name	Scientific degree	Institutional e-mail	Specializations
1	Osman El-Magraby	Prof.	osman.elmaghrebi@science.sohag.edu.eg	Microbiology
2	Sabah Saber Mohamed	Prof.	sabah.hassan@science.sohag.edu.eg	Microbiology
3	Mohamed Youssef	Prof.	youssefMS@science.sohag.edu.eg	Microbiology
4	Mohamed Bassam Aboul-Nasr	Prof.	mohamed.mohamed1@science.sohag.edu.eg	Microbiology
5	Marwa Abdelkareem	Assistant Prof.	marwa_abdelkareem@science.sohag.edu.eg	Microbiology
6	Samia Soliman	Lect.	samiasoliman@science.sohag.edu.eg	Microbiology
7	Marwa Obiedallah	Lect.	m.obiedallah@science.sohag.edu.eg	Microbiology
8	Nehad Adel Elaraby	Assistant lecturer	nehad.adel@science.sohag.edu.eg	Microbiology
9	Randa Adel	Assistant lecturer	randaadel@science.sohag.edu.eg	Microbiology

Institutions and entities benefiting from the laboratory

- **Faculty of medicine**
- **Faculty of pharmacy**
- **Faculty of science**

Plant physiology

Research plan for Plant physiology Laboratory

- Study of the physiological and biochemical effect of biotic and abiotic stresses on plants.
- Study the effect of growth regulators and plant hormones on growth of plants under environmental stressors.
- Study the vulnerability of plants to various environmental factors such as heat change, drought, salinity, light and others.
- Study plant nutrition and provide the best conditions for germination and growth under the influence of various growth regulators.
- Enzyme extraction and estimation of enzyme activity
- Testing the resistance of plants against microbial infections using certain chemical compounds that have a role in stimulating the plant's resistance system.

Research activities:

- Assessment of growth and physiological activities of pea and soybean plants due to application of derby and topik herbicides and role of antioxidant vitamins.
- Physiological, subcellular, and molecular aspects of wheat due to herbicides treatments.
- Effect of herbicides and bio fertilizers on growth yield and physiological activities of soybean crop

Services provided by the laboratory