

15.2.3 Maintain and extend existing ecosystems and their biodiversity, of both plants and animals, especially ecosystems under threat

Conservation: plant, animal, and wildlife, genetic resources for food and agriculture secured in either medium or long-term conservation facilities

- Green House (Faculty of Veterinary Medicine).
- Plantation (Faculty of Veterinary Medicine).
- Cattle Farming (Faculty of Veterinary Medicine).
- Botanic Garden (Faculty of Science in Moharram Bek).
- Botanic Garden, Green House (Faculty of Science in Moharram Bek) and its location in Alexandria City.
- Wildlife Conservation of some important fern.
- Preparation of Herbarium sheet for conservation plant species.

Botanic Garden (Faculty of Science in Moharram Bek)

What AlexU is doing: biodiversity & conservation / environmental sustainability activities

Faculty of Science, Alexandria University – Herbarium & Plant Collections of species under threat





5502

Faculty of Science
Department of Botany & Microbiology

Faculty of Science
The Herbarium

جامعة الإسكندرية
ALEXANDRIA
UNIVERSITY
كلية العلوم

Faculty of Science
Department of Botany & Microbiology
The Herbarium

Herbarium Alex.

Family: *Solanaceae*
Species: *Nicotiana glutinosa* L.
Location: N: 31.2° E: 29.821° Date: 6- oct. 022
Collected by: Heneidy et al.
Identified by: Heneidy et al.
Director: *Selim Z. Heneidy* Code C: *SH*
S. M. *Dec. 022* *5502*

- The Faculty of Science maintains a Herbarium that is listed in the international “Index Herbariorum.” The collection includes up to 6,000 specimens of wild plants, representing many of Egypt’s flowering plants. Specimens have been collected from the northern coast, Sinai, southern Egypt, and other regions.
- The Herbarium is used by graduate students and researchers for botanical studies, conservation, taxonomy, and ecological research.
- Efforts are underway to digitally photograph the plant specimens — which helps preserve the reference samples and makes them more accessible to researchers without repeatedly handling delicate material.

This kind of work — cataloguing, preserving, and studying native flora — constitutes a concrete contribution to biodiversity conservation of species under threat , especially of plant genetic resources and species oversight.

The university botanic garden at the Faculty of Science is valuable to the educational and training facilities available to staff and students. In it, students can come to close intimacy with plants, use their senses of touch, smell and taste in familiarizing themselves with life features of plants, and develop their observation abilities in studying plants as they grow, mature and regenerate. Information intake is considerable. Land plots, greenhouses and sheds provide space for field experiments that may be part of botanical garden accumulates experiences and knowledge related to plant life; grasping this wealth of information and documenting it is a most welcome enterprise. University botanic gardens often accommodate exotic species brought in to represent: (1) diverse ecological conditions in world biogeographical regions, and (2) diverse taxonomic groups of the plant kingdom. Husbanding and nursing these alien plants may need innovative means. This broadens the scope of work. The University botanical garden of Alexandria has its shares of these general attributes.



Botanic Garden (Faculty of Science in Moharram Bek)

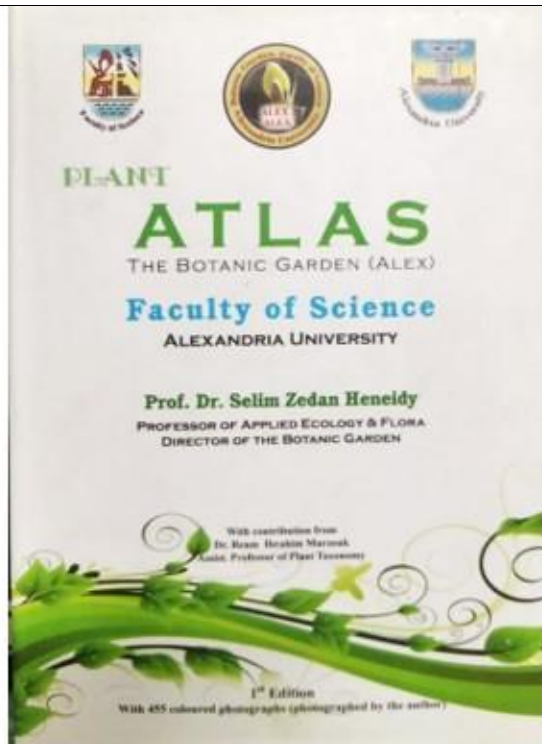


Botanic Garden, Green House (Faculty of Science Moharram Bek)

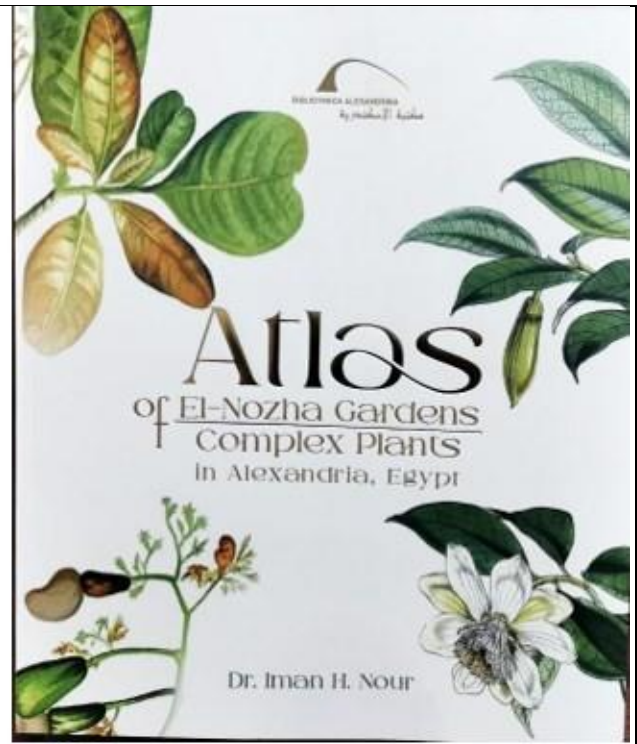
The Botanical Garden is an institution holding documented collections of living plants for the purposes of scientific research, conservation, display and education.

- In 1942, a botanical garden was established at the Southern area of Muharrem Bek building (**Faculty of Science, King Farouk University**), between the coordinates: N: 31° 11' 19.38" E: 29° 54' 28.14", (Figure 1) and constituted a facility for education as well as for scientific research. Since 1942, the Botanical Garden was greatly developed and was provided with different plant species especially trees and shrubs introduced from different regions by Professor Mohamed Aziz Fekry (the Dean of Faculty of Science and Head of Botany Department 1948- 1958). It was consistently ranked as one of the top gardens by the International Union for Scientific Gardens (International code is **ALEX**), and holds some of the rare and most impressive species that facilitate improved learning, and teaching students; the purpose for which it was designed.
- This area (about 1.4 hectares) is of international concern attracting a large number of overseas visitors, who come specially to see its collections. Although these are the main objectives, care has been taken to make the garden inexpensive to maintain, as well as interesting and attractive so as to provide for the local community, staff and students the garden as a reference collection.
- According to the Global Strategy for Plant Conservation (GSPC), it is very important to put this garden on the schedule which means, listing and conserving all the garden's collections to become known, at least at the regional levels and next on the international level. With more than 455 species and 24 infraspecific epithets (subspecies, variety, forma), indigenous and introduced, in the Botanical Garden of the Faculty of Science, most of them represent tropical, subtropical, temperate species and the rest belong to the Mediterranean zone. This number is a very significant proportion of the Egyptian flora, as they belong to 121 families (total flowering plant families, which are treated 128 Boulos, 2005) while, the families treated in the checklist 2009 are 129 (Boulos, 2009). On the other hand, this garden is characterized by its high diversity,
- so the conservation of this plant diversity is both an enormous challenge and significant regional and national responsibility. It is well recognized that the plant diversity represents the greatest source of renewable natural resources of any country. More than 25% of plant species of this botanical garden are of medicinal value, about 14% of them are used as timber and good source of valuable wood. While 86% of the botanic garden species are used in decoration. All of these species are used as teaching materials for the students of biology. Some families appear in this book under two names, e.g. Compositae and Asteraceae. According to the "International Code of Botanical Nomenclature" (ICBN) both names are accepted. In other words, one is not a synonym of the other; these are alternative names and any or both of them could be used to refer to the same family (cited by Boulos, 2009).
- Recently (in 2003) according to the Botanical Gardens Conservation International (BGCI), *ex-situ* conservation by vegetative propagation of rare species is carried out in the green houses of the Faculty of Science, Botanic Garden. For the purpose of genetic resources conservation, exchange of plant species with other botanic gardens and bulk collection of seeds representing most of plant species cultivated in the garden is also currently executed.

- In the open areas of the garden, various trees and seasonal annuals are planted, providing students with a complete opportunity to study these different plant types. What makes the garden of heritage and environmental importance is that it contains plants from different geographical regions: tropical, subtropical, temperate, and some Egyptian and Arab species. Some of these species are rare, and others are threatened with extinction and degradation. The botanical garden's activities are not limited to education but extend to scientific research. The garden provides researchers from the departments of Botany, Zoology, and Marine Sciences with the facilities to conduct their research, continuing its mission of serving science.
- Currently, the garden is one of the richest scientific gardens in Egypt, with its diverse plant species. Internationally recognized and registered with the International Association of Botanical Gardens, ALEX actively participates in global conservation efforts, including preserving endangered species and maintaining a seed bank. A comprehensive inventory of species is underway, along with conservation efforts for rare plants. The garden holds significant environmental and heritage value due to its collection of rare and diverse species.
- A book cataloging 500 species is being published, supporting the garden's educational and research mission. Therefore, scientifically cataloging and identifying them is a preservation of this heritage. This is in addition to the primary goal for which the garden was established: educating students, scholars, and researchers in basic sciences, practicing and observing them practically to understand the value of this natural wealth and preserve it for continuous benefit. Therefore, they have been collected and classified in a book containing approximately 500 plant species, including ferns, conifers, gymnosperms, and angiosperms, in more than 540 pages supported by original colored photographs, which is now under publication.



Atlas of the Botanic Garden (ALEX) located at the Faculty of Science, Alexandria University.



Conservation efforts and floristic documentation of the historic Al-Nozha garden complex: An Atlas published by Bibliotheca Alexandrina to support the conservation of gardens surrounding the University Campus



ALEX Herbarium of the Faculty of Science, Alexandria University

ALEX Herbarium of the Faculty of Science

- The herbarium is listed in the Index Herbariorum (NYBG Steere Herbarium), contains a large collection of preserved wild plants, totaling up to 6,000 specimens, located in the Faculty of Science building in Shatby. These plants represent most of the Egyptian flowering plants and are accurately identified using flora books and cross-referenced with the Cairo University Herbarium. Specimens have been collected from the northern coast, North and South Sinai, southern Egypt up to the Sudanese border, and other regions.
- The herbarium serves graduate students and various research projects at Alexandria University and other universities. It is also a source of pollen samples for various studies. Students from various schools in Alexandria, as well as public and private universities across Egypt, are welcomed at the Herbarium of the Faculty of Science. These visits aim to introduce them to the herbarium's role, which is essential for preserving plant specimens and aiding in research, education, and conservation efforts. This effort is part of the university's plan to serve the community and achieve the 17th goal of sustainable development (partnership for the goals).
- Currently, the herbarium's plant species are being digitally photographed to facilitate the access of researchers and students without disturbing the type specimens or "reference samples" unless necessary.
- Researchers at Alexandria University are working on studies aimed at protecting and preserving the marine environment located close to the university's campus. Their research likely involves efforts to prevent pollution, protect marine biodiversity, and maintain the health of the coastal ecosystem. The focus is on ensuring that the nearby marine environment remains sustainable and unharmed by human activities or other environmental threats.

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Water quality indices as tools for assessment of the Eastern Harbor's water status (Alexandria, Egypt)

Research Article
Volume 5, article

Alaa A. El-Dahhar
Faculty of Agriculture (Saba Basha), Alexandria University, Alexandria, Egypt

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Wagdy Labib, **Alaa A. El-Dahhar**, Shima A. Shaha, Mona M. Ismail, Shima Hosny & Mohamed H. Diab

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Monitoring of Microplastics in the Marine Environment and Their Ecological Risks; the Coastline of Alexandria, Egypt as a Case study

Nourhan Hamdy, Amany M. Osman, Hassan Awad, Nashwa A. Shaaban*
Oceanography Department, Faculty of Science, Alexandria University, Egypt
*Corresponding Author: Nashwa.shaaban@alexu.edu.eg

Researchers at Alexandria University are conducting studies to conserve the marine environment near the University Campus

- An academic team (Ph.D.) from the Faculty of Science at Alexandria University teaches a course titled 'Man and Environment' (University Elective Course – 2 Credits). The course addresses environmental problems, types of natural resources, pollution, environmental footprint, carbon footprint, waste management, recycling, climate change and global warming, biodiversity, and the Sustainable Development Goals (SDGs). It is offered to students from various faculties at Alexandria University, such as:

- 1) Faculty of Science
- 2) Faculty of Tourism
- 3) Faculty of Agriculture
- 4) Faculty of Sport Education
- 5) Faculty of Business
- 6) Faculty of Computers and Data Science
- 7) Faculty of Dentistry
- 8) Faculty of Economics and Political Science
- 9) Faculty of Arts
- 10) Faculty of Nursing

Also, this course is offered in some programs at Alexandria National University, including:

- A. Computer and Data Sciences (CDS) Programs
- B. Oral and Dental Surgery Program
- C. Software and Multimedia Production Program (SIM)

- Courses focused on marine environments and the sustainability of marine ecosystems make use of the Research Yacht, located at the Faculty of Science in the Anfoushi area and equipped with a GPS system. Students and researchers utilize the yacht for field trips to collect samples and conduct essential studies. This access to the Research Yacht greatly supports the study, understanding, and conservation of marine life.



- A sea-cleaning robot was developed by a team of students from the Faculty of Engineering during the COP27 Climate Summit. The project involves creating an environmentally friendly vehicle that operates using electricity and solar energy, producing no emissions. Its purpose is to remove waste and oil from the seas while compiling important statistics on the impact of climate change on marine life and the environment, including coral reefs and fish. This project aims to protect the environment from waste by focusing on cleaning ports and coasts polluted by various types of waste, especially plastic, to preserve marine ecosystems. Additionally, the robot is designed to dive underwater. Many companies were interested in sponsoring this project and expanding it to benefit Egypt and the world. This initiative reflects the growing awareness among students.

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