



**Pole for Doctoral Studies**  
**Center for Doctoral Studies Sciences, Technologies, and Medical Sciences**

## **ANNOUNCEMENT OF DOCTORAL THESIS DEFENSE**



**M. EL KARMOUDI Yahya**

**Will present here research work with the aim of earning a  
Doctorate**

**Doctoral program: Biology, Geology and Chemistry**  
**Discipline: Biological Sciences**

**Specialty: Ecology, Systematic Botany and Conservation Biology**

**On 15/11/2025 at 10H30 at Thesis Defense Hall of The Faculty of  
Sciences of Tetouan, UAE  
Under the Theme**

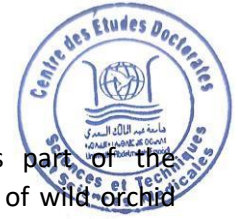
**The Orchidaceae Members of the Intercontinental Biosphere Reserve  
of the Mediterranean (Moroccan Part, Northern Morocco): Diversity,  
Distribution Factors, and Conservation Challenges**

**Front of the jury composed of :**

<b>First Name &amp; Last Name</b>	<b>Establishment</b>	<b>Designation</b>
<b>Pr. NARD Bennis</b>	<b>FS of Tetouan, UAE</b>	<b>President</b>
<b>Pr. ENNABILI Abdeslam</b>	<b>EST of Fez, USMBA</b>	<b>Reviewer</b>
<b>Pr. KETTANI Kawtar</b>	<b>FS of Tetouan, UAE</b>	<b>Reviewer</b>
<b>Pr. EL HAISSOUFI Mohamed</b>	<b>FP of Taza, USMBA</b>	<b>Reviewer</b>
<b>Pr. KHABBACH Abdelmajid</b>	<b>FSDM of Fez, USMBA</b>	<b>Examiner</b>
<b>Pr. TAHERI Ahmed</b>	<b>FS of Tetouan, UAE</b>	<b>Examiner</b>
<b>Pr. LIBIAD Mohamed</b>	<b>FS of Tetouan, UAE</b>	<b>Supervisor</b>

**Host Research Structure:** Host Research Structure : Ecology, Systematics and Conservation of Biodiversity Team (LESCB),  
URL-CNRST N°18, FS, Abdelmalek Essaadi University

## Abstract



The Intercontinental Biosphere Reserve of the Mediterranean, which is part of the Mediterranean basin and is considered a biodiversity hotspot. The outdated nature of wild orchid inventories, along with the low spatial accuracy of their recorded locations, remains a challenge in Morocco.

In this context, the present work aims to establish an inventory of Orchidaceae taxa present in the Moroccan part of the Intercontinental Biosphere Reserve of the Mediterranean and its surroundings areas (West Rif area), as well as the factors likely to influence their distribution and their in-situ conservation. Using a series of field surveys carried out in the natural and/or semi-anthropogenic ecosystems of the study area.

A total of 95 sites were surveyed in different parts of the study area. This study reported the identification of 34 species and subspecies of Orchidaceae belonging to eight genera, including five newly recorded taxa in Morocco, namely *Orchis spitzelii* subsp. *cazorlensis*, *Ophrys phryganae*, *Ophrys sicula*, *Ophrys tenthredinifera* subsp. *grandiflora*, and *Ophrys villosa*. The Outlying Mean Index analysis highlighted the importance of elevation, latitude, longitude, annual mean temperature, soil moisture, slope, substrate type, and specific habitat types in shaping orchid distribution in the Intercontinental Biosphere Reserve of the Mediterranean.

Orchids occurred across diverse habitats including herbaceous vegetation, coniferous and oak forests, matorrals, and wetlands. *Serapias* spp. were primarily associated with high-moisture habitats in Talassemtane National Park and Bouhachem Natural Parks, whereas most *Ophrys* and *Orchis* taxa preferred forested calcareous sites. The OMI analysis revealed that five out of the 23 analysed orchid species and subspecies (*Epipactis tremolsii*, *Limodorum trabutianum*, *Orchis anthropophora*, *Ophrys battandieri*, and *Orchis mascula* subsp. *laxifloriformis*) are strongly specialized to certain environmental conditions.

Most of the Orchidaceae species in the Intercontinental Biosphere Reserve of the Mediterranean and its surroundings areas were found in limited numbers of individuals and with restricted distribution, and were assessed as poorly conserved due to several factors; namely scarcity of rainfall coupled with human pressures such as water drainage, forest fires, Cannabis cultivation, etc. Enforcing existing laws, adopting strategies to combat desertification and forest fires, prohibiting cannabis farming and raising awareness among the local population could reduce pressures on Orchidaceae and their habitats, thus contributing to their conservation.

**Keywords:** Cannabis farming, Habitat destruction, Ex situ conservation, Distribution factors, Fire, Inventory, In situ conservation, OMI analysis, Orchids, Talassemtane National Park, Bouhachem Natural Park, Vascular plants.