

# *Ex situ* conservation actions of the project “CARE-MEDIFLORA”

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2nd Mediterranean Plant Conservation Week  
Session 1 - *Ex situ* plant species conservation  
La Valetta, Malta, 12 November 2018



# The project



- CARE-MEDIFLORA aims to improve the conservation status of threatened plant species of the Mediterranean



# The project

## Objectives:

- *in situ* conservation of endangered plant species of the Mediterranean islands
- *ex situ* conservation of endangered plant species through seed collection and long term storage in seed banks of accessions representative of the overall diversity of selected taxa
- increase collaboration among institutions involved with *in situ* and *ex situ* conservation
- raise awareness about local flora vulnerability

# The Consortium



# Elaboration of conservation priorities and selection of target species in the different islands

- Four criteria for the selection of the species
  - Threat degree
    - IUCN criteria (CR, EN, VU and DD)
  - Regional responsibility
    - Endemic species, Peripheral and Isolated Plant Populations
  - Policy plant species
    - Annexes of the Habitat Directive, National legislations and regulations
  - Wetland species
    - Vulnerability to climate change

# Elaboration of conservation priorities and selection of target species in the different islands

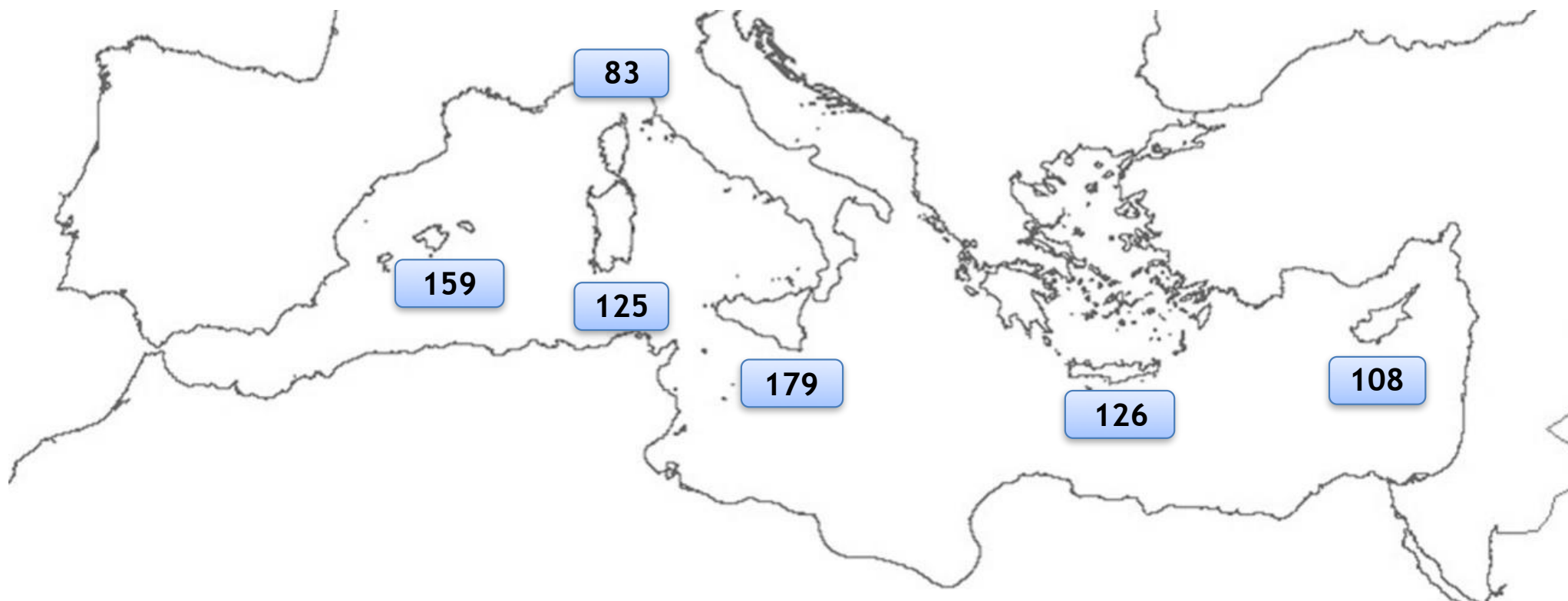
- **Distribution type**

- ENE = Extremely narrow endemic (only one population)
- NE = Narrow endemic ( $\leq$  five populations)
- RE = Regional endemic (only one island)
- IE = Insular endemic (more than one island)
- W= Distributed in a wider area

# Elaboration of conservation priorities and selection of target species in the different islands

Taxon "Plant List"	Taxon (local checklist)	Taxon (Euro+Med Plant Base)	Island(s) of occurrence						Distributi n type	Criterion				WCR	In situ	Location(s)	Action(s)		Note
			BL	CO	SA	SI	CR	CY		RL	RR	HD	WP				WCR	Ex situ	
<i>Acer granatense</i> Boiss.	<i>Acer granatense</i> Boiss.		1						NE		1					1	Balearic Islands		
<i>Achillea cretica</i> L.	<i>Achillea cretica</i> L.	<i>Achillea cretica</i> L.						1	W	1			1			1	Cyprus		
<i>Acis autumnalis</i> (L.) Sweet	<i>Acis autumnalis</i> (L.) Sweet	<i>Leucopodium autumnale</i> L.	1	1					IE		1					1	Balearic Islands		
<i>Aconitum napellus</i> subsp. <i>corsicum</i> (Gäyer) W. Seitz	<i>Aconitum napellus</i> subsp. <i>corsicum</i> (Gäyer) W. Seitz			1					RE	1	1	1	1	1	1	1	Corse	1	Corse
<i>Adenocarpus bivonii</i> (C. Presl) C. Presl (unresolved)	<i>Adenocarpus bivonii</i> (C. Presl) C. Presl					1			NE		1		1	1	1	1	Sicily	1	Sicily
<i>Adenocarpus commutatus</i> Guss.	<i>Adenocarpus commutatus</i> Guss.	<i>Adenocarpus complicatus</i> subsp. <i>commutatus</i> (Guss.) Cout.				1			NE		1		1			1	Sicily	1	Sicily
<i>Aeluropus lagopoides</i> (L.) Thwaites	<i>Aeluropus lagopoides</i> (L.) Trin. ex Thwaites	<i>Aeluropus lagopoides</i> (L.) Thwaites			1	1	1	1	W			1	1	1	1	1	Sicily	1	Sicily
<i>Aethionema saxatile</i> (L.) R. Br.	<i>Aethionema saxatile</i> (L.) R. Br.	<i>Aethionema saxatile</i> (L.) W. T. Aiton			1	1	1		W		1		1			1	Sicily	1	Aethionema saxatile (L.) R. Br. subsp. creticum (Boiss. & Heldr.) I. A. Andersson, Carlström, Franzen, Karlen & Nybom is native to Crete
<i>Agrimonia eupatoria</i> L.	<i>Agrimonia eupatoria</i> L.	<i>Agrimonia eupatoria</i> L.	1	1	1	1	1	1	W	1			1			1	Cyprus	1	Cyprus
<i>Agrostis barceloi</i> L. Sáez & Rosselló	<i>Agrostis barceloi</i> L. Sáez & Rosselló		1						ENE	1	1		1			1	Balearic Islands	1	Balearic Islands
<i>Alkanna lutea</i> A.DC	<i>Alkanna lutea</i> Moris	<i>Alkanna lutea</i> DC		1	1				W	1	1		1			1	Corse	1	Corse
<i>Allium autumnale</i> P.H.Davis	<i>Allium autumnale</i> P. H. Davis						1		RE		1		1			1	Cyprus	1	Cyprus
<i>Allium commutatum</i> Guss.	<i>Allium commutatum</i> Guss.	<i>Allium commutatum</i> Guss.	1	1	1	1	1	1	W	1			1			2	Balearic Islands, Sicily	2	Balearic Islands, Sicily
<i>Allium cyprium</i> Brullo, Pavone & Salmeri	<i>Allium cyprium</i> Brullo, Pavone & Salmeri	<i>Allium cyprium</i> Brullo, Pavone & Salmeri					1		RE	1			1			1	Cyprus	1	Cyprus
<i>Allium ebusitanum</i> Font Quer	<i>Allium ebusitanum</i> Font Quer	<i>Allium ebusitanum</i> Font Quer	1						NE		1		1			1	Balearic Islands	1	Balearic Islands
<i>Allium exaltatum</i> (Meikle) Brullo, Pavone, Salmeri & Venora	<i>Allium exaltatum</i> (Meikle) Brullo & al.	<i>Allium exaltatum</i> (Meikle) Brullo, Pavone, Salmeri & Venora					1		RE	1			1			1	Cyprus	1	Cyprus
<i>Allium grosii</i> Font Quer	<i>Allium grosii</i> Font Quer	<i>Allium grosii</i> Font Quer	1						NE	1	1		1			1	Balearic Islands	1	Balearic Islands
<i>Allium guttatum</i> Steven	<i>Allium guttatum</i> Steven subsp. <i>guttatum</i>	<i>Allium guttatum</i> Steven subsp. <i>guttatum</i>					1		RE	1			1			1	Cyprus	1	Cyprus
<i>Allium marathasicum</i> Brullo, Pavone & Salmeri	<i>Allium marathasicum</i> Brullo & al.	<i>Allium marathasicum</i> Brullo, Pavone & Salmeri					1		ENE	1	1		1	1	1	1	Cyprus	1	Cyprus
<i>Allium platakisii</i> Tzanoud. & Kypri	<i>Allium platakisii</i> Tzanoud. & Kypri	<i>Allium platakisii</i> Tzanoud. & Kypri				1			ENE	1	1		?			1	Crete	1	Crete
<i>Alyssum chondrogynum</i> Burt	<i>Alyssum chondrogynum</i> B. L. Burt	<i>Odontarrhena chondrogyne</i> (B. L. Burt) Španiel, Al-Shehbaz, D. A. German & Marhold					1		RE	1			1			1	Cyprus	1	Cyprus
<i>Alyssum cypricum</i> Nyár.	<i>Alyssum cypricum</i> Nyár.	<i>Odontarrhena cyprica</i> (Nyár.) Španiel, Al-Shehbaz, D. A. German & Marhold					1		W	1			1			1	Cyprus	1	Cyprus
<i>Alyssum fallacinum</i> Hausskn.	<i>Alyssum baldacii</i> Vierh. ex Nyár	<i>Alyssum baldacii</i> Vierh. ex E.I.Nyár.					1		W	1	1		1			1	Crete	1	Crete
<i>Alyssum fragillimum</i> (Bald.) Rech.f.	<i>Alyssum fragillimum</i> (Bald.) Rech.f.	<i>Alyssum fragillimum</i> (Bald.) Rech.f.					1		NE	1	1		1			1	Crete	1	Crete
<i>Alyssum idaeum</i> Boiss. & Heldr.	<i>Alyssum idaeum</i> Boiss. & Heldr.	<i>Alyssum idaeum</i> Boiss. & Heldr.					1		NE	1	1		1			1	Crete	1	Crete
<i>Alyssum lassiticum</i> Halácsy	<i>Alyssum lassiticum</i> Halácsy	<i>Alyssum lassiticum</i> Halácsy					1		NE	1	1		1			1	Crete	1	Crete
<i>Alyssum sphacioticum</i> Boiss. & Heldr.	<i>Alyssum sphacioticum</i> Boiss. & Heldr.	<i>Alyssum sphacioticum</i> Boiss. & Heldr.					1		NE	1	1		1			1	Crete	1	Crete
<i>Alyssum troodi</i> Boiss.	<i>Alyssum troodi</i> Boiss.	<i>Odontarrhena troodi</i> (Boiss.) Španiel, Al-Shehbaz, D. A. German & Marhold					1		RE		1		1			1	Cyprus	1	Cyprus
<i>Amelanchier ovalis</i> Medik.	<i>Amelanchier ovalis</i> subsp. <i>embergeri</i> Favarger & Stearn	<i>Amelanchier ovalis</i> Medik.				1			W		1		1			1	Sicily	1	Sicily
<i>Ammophila arenaria</i> (L.) Link	<i>Ammophila arenaria</i> (L.) Link	<i>Ammophila arenaria</i> (L.) Link	1	1	1	1	1	1	W	1			1			1	Cyprus	1	Cyprus
<i>Anchusa cespitosa</i> Lam.	<i>Anchusa cespitosa</i> Lam.	<i>Anchusa cespitosa</i> Lam.					1		NE	1	1		1			1	Crete	1	Crete
<i>Anchusa crispa</i> Viv.	<i>Anchusa crispa</i> Viv. subsp. <i>crispa</i>	<i>Anchusa crispa</i> Viv. subsp. <i>crispa</i>		1	1				IE	1	1	1	1	1	1	1	Corse	2	Corse, Sardinia
<i>Anchusa crispa</i> Viv. subsp. <i>maritima</i> (Vals.) Selvi & Bigazzi	<i>Anchusa crispa</i> Viv. subsp. <i>maritima</i> (Vals.) Selvi et Bigazzi	<i>Anchusa crispa</i> subsp. <i>maritima</i> (Vals.) Selvi & Bigazzi				1			NE	1	1	1	1			1	Sardinia	1	Sardinia
<i>Anchusa crispa</i> Viv.	<i>Anchusa sardoa</i> (Illario) Selvi et Bigazzi	<i>Anchusa sardoa</i> (Illario) Selvi et Bigazzi				1			ENE	1	1		1			1	Sardinia	1	Sardinia
<i>Anchusa undulata</i> subsp. <i>hybrida</i> (Ten.) Cout.	<i>Anchusa undulata</i> L. subsp. <i>hybrida</i> (Ten.) Cout.	<i>Anchusa undulata</i> subsp. <i>hybrida</i> Cout. [non (Ten.) Bég.]	1?	1	1	1	1	1	W	1	1		1			1	Corse	1	Corse
<i>Androcymbium rechingeri</i> Greuter	<i>Androcymbium rechingeri</i> Greuter	<i>Androcymbium rechingeri</i> Greuter					1		W	1	1		1	1	1	1	Crete	1	Crete
<i>Andryala cossyrensis</i> Guss.	<i>Andryala cossyrensis</i> Guss.	<i>Andryala cossyrensis</i> Guss.				1			RE	1	1		1			1	Sicily	1	Sicily

# Elaboration of conservation priorities and selection of target species in the different islands





# Elaboration of conservation priorities and selection of target species in the different islands

# Planning *ex situ* conservation activities

Taxon "Plant List"	Taxon (Euro+Med Plant Base)	Taxon (local checklist; Flora of Cyprus portal)	Ex situ Activity	Selected population(s)	Reason(s)
Clinopodium troodi subsp. vardaranum (Leblebici) Govaerts	Clinopodium troodi subsp. vardaranum (Leblebici) Govaerts	Acinos troodi (Post) Leblebici subsp. troodi	1	Chionistra; Prodomos	Threatened by reforestation works, by trampling and skiing activities
Allium marathasicum Brullo, Pavone & Salmeri	Allium marathasicum Brullo, Pavone & Salmeri	Allium marathasicum Brullo, Pavone & Salmeri	1	Prodomos	Threatened by land development, but mainly by land abandonment and weed control practices
Anthemis tomentosa Boiss.	Anthemis tomentosa L.	Anthemis tomentosa L.	1	Timi near the airport; Kato Pafos near Faros	Threatened by the heavy use of the coast
Arum cylindraceum Gasp.	Arum cylindraceum Gasp. (no reference for the subspecies)	Arum cylindraceum subsp. pitsyllianum Hadjik. & al.	1	Madari; Papoutsas	A very rare recently discovered endemic . Small population and restricted distribution.
Arum sintenisii (Engl.) P.C.Boyce	Arum sintenisii (Engl.) P. C. Boyce	Arum sintenisii (Engl.) P. C. Boyce	1	Lysos (orig. Androlikou); Istinkio	Threatened by overgrazing and expansion of built-up areas
Astragalus suberosus Banks & Sol.	Astragalus suberosus Banks & Sol.	Astragalus suberosus Banks & Sol.	1	Ammos tou Kampouri near Agia Napa; Agios Nikandros; Agia Thekla	Threatened by expansion of built-up areas and tourist development
Campanula podocarpa Boiss.	Campanula podocarpa Boiss.	Campanula podocarpa Boiss.	1	Troodos	Considered as extinct but it was recently found in a single locations

# Planning *ex situ* conservation activities

Target species (Plant list)	Target species (Euro+Med Plant Base)	Target species (Local floras)	Selected population(s) for the ex situ activities	2016						2017						2018					
				Apr	III	IV	V	VI	I	II	III	IV	V	VI	I	II	III	IV	V	VI	
Clinopodium troodi subsp. vardaranum (Leblebici) Govaerts	Clinopodium troodi subsp. vardaranum (Leblebici) Govaerts	Acinos troodi (Post) Leblebici subsp. troodi	Chionistra			Co	Cu	Cu							Du			St	St	St	
Allium autumnale P.H.Davis	Allium autumnale P. H. Davis	Allium autumnale P. H. Davis	Filani - Machairas					Co		Cu	Cu				Du			St	St	St	
Allium autumnale P.H.Davis	Allium autumnale P. H. Davis	Allium autumnale P. H. Davis	Saittas					Co		Cu	Cu				Du			St	St	St	
Allium exaltatum (Meikle) Brullo, Pavone, Salmeri & Venora	Allium exaltatum (Meikle) Brullo, Pavone, Salmeri & Venora	Allium exaltatum (Meikle) Brullo & al.	Madari			Co	Cu	Cu							Du			St	St	St	
Allium guttatum Steven	Allium guttatum Steven subsp. guttatum	Allium guttatum Steven subsp. guttatum	Macheras, Mantra tou Kampiou-Profitis Ilias			Co	Cu	Cu							Du			St	St	St	
Allium marathasicum Brullo, Pavone & Salmeri	Allium marathasicum Brullo, Pavone & Salmeri	Allium marathasicum Brullo & al.	Prodromos			Co	Cu														
Alyssum troodi Boiss.	Odontarrhena troodi (Boiss.) Španiel, Al-Shehbaz, D. A. German & Marhold	Alyssum troodi Boiss.	Troodos, ski club			Co					Cu	Cu			Du			St	St	St	
Anthemis tomentosa Boiss.	Anthemis tomentosa L.	Anthemis tomentosa L.	Timi near the airport		Co	Cu	Cu								Du			St	St	St	
Anthemis tomentosa Boiss.	Anthemis tomentosa L.	Anthemis tomentosa L.	Kato Pafos near Faros		Co	Cu	Cu								Du			St	St	St	
Arum sintenisii (Engl.) P.C.Boyce	Arum sintenisii (Engl.) P. C. Boyce	Arum sintenisii (Engl.) P. C. Boyce	Lysos (orig. Androlikou); Istinkio				Co	Cu										St	St	St	

# *Ex situ* conservation

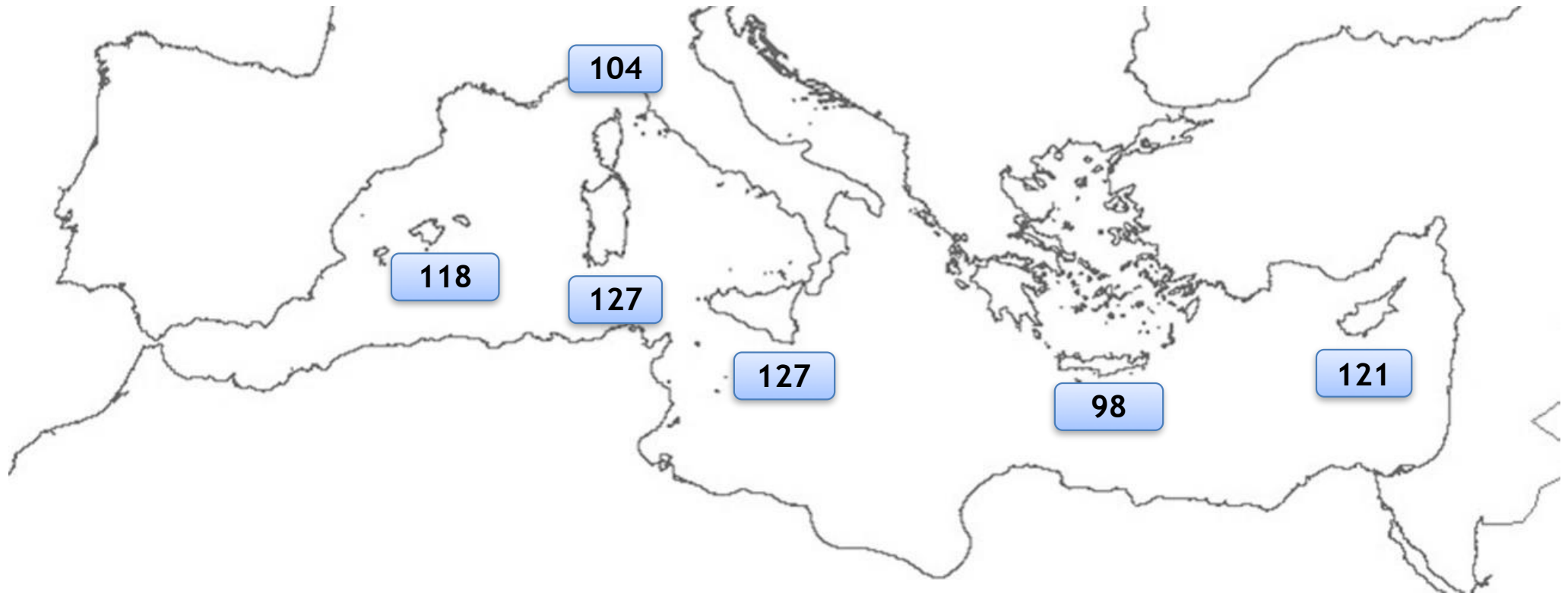
## Target

**600 accessions of 120 target taxa  
(100 accessions for minimum  
20 taxa per island)**

# Authorizations for seed collecting

Partner	Competent authority
Sardinia	“Ministero dell’Ambiente e della Tutela del Territorio e del Mare”.
Crete	Ministry of Environment, Energy & Climate Change
Mallorca	Species Protection Service
Cyprus	Ministry of Agriculture, Rural Development and Environment (Inform.)
Corsica	French Ministry of Ecological and Solidarity Transition
Sicily	SIC: Regional Forest Authority & Ministero dell’Ambiente e della Tutela del Territorio e del Mare”

# Accessions collected



Number of accessions	695
Number of taxa	418
Number of genera	234
Number of families	72

# Accessions collected

# Accessions collected

**GSPC Target 8:** At least 75 per cent of threatened plant species are conserved in *ex situ* collections, preferably in the country of origin, and at least 20 per cent available for recovery and restoration programs.



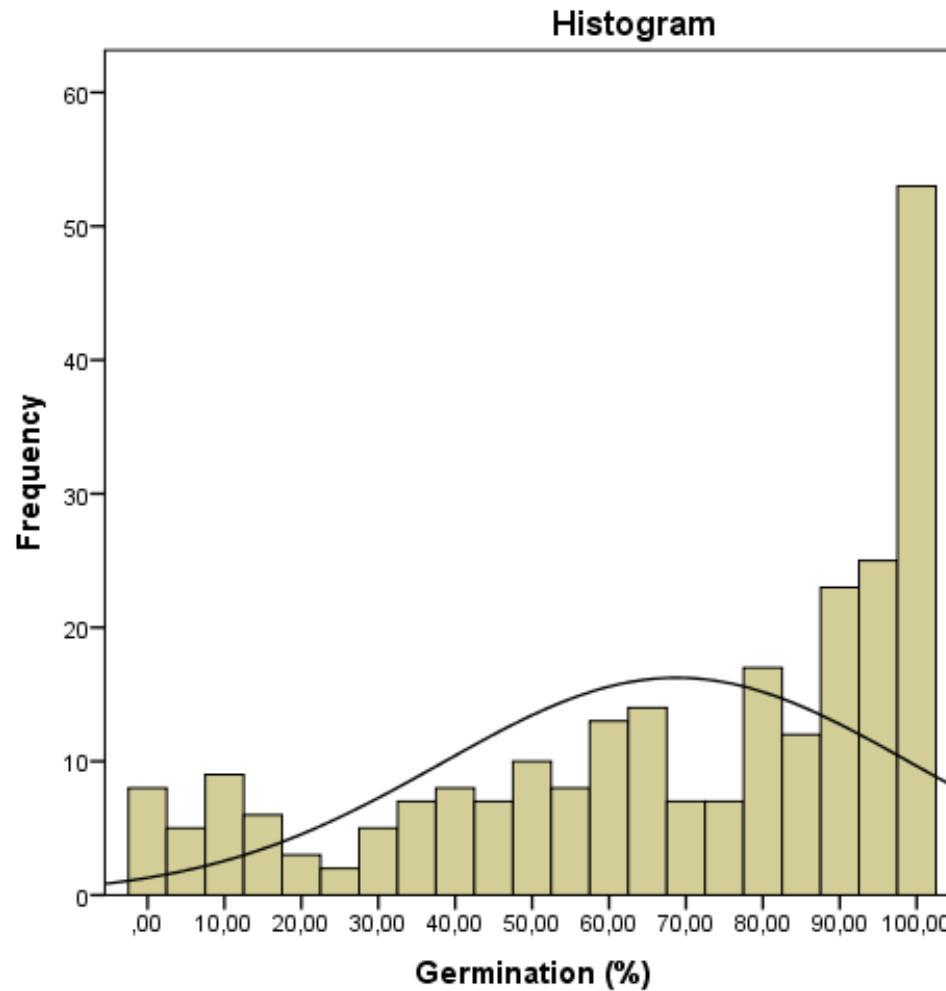
# Duplication

Partner	Number of accessions duplicated	Duplication site	Agreement between the two parties
Mallorca	49	Valencia Botanical Garden and Barcelona Botanic Garden, Spain	Yes
Cyprus	102	Department of Forests, Cyprus	Yes
Sardinia	52	University of Catania, Italy	Yes
Crete	23	National and Kapodistrian University of Athens, Greece	Yes
Corsica	50	INRA , France	Yes
Sicily	55	University of Cagliari, Italy	Yes
<b>Total</b>	<b>331</b>		

# Germination tests

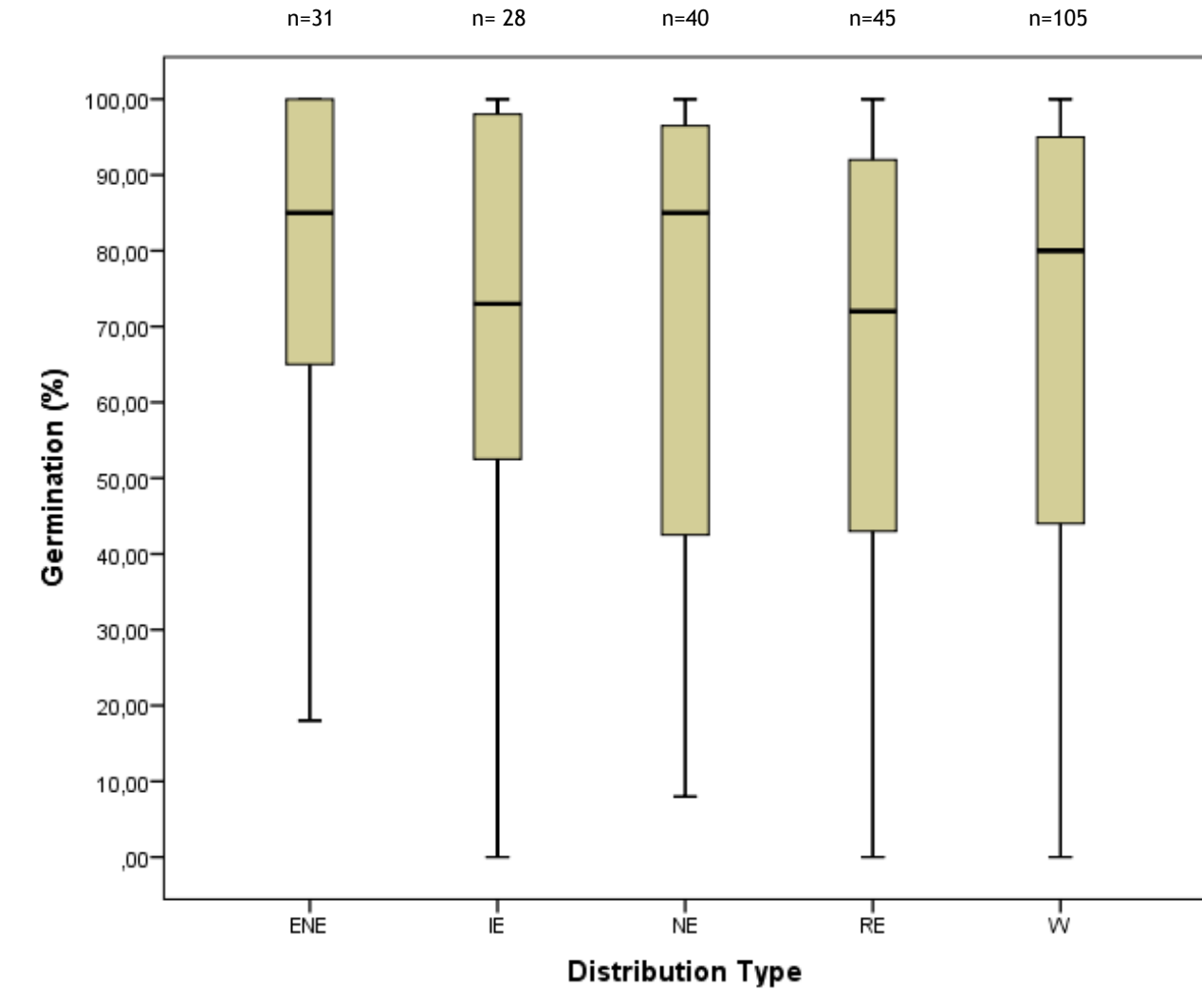
Number of accessions	249
Number of taxa	208
Number of genera	146
Number of families	50

# Germination tests

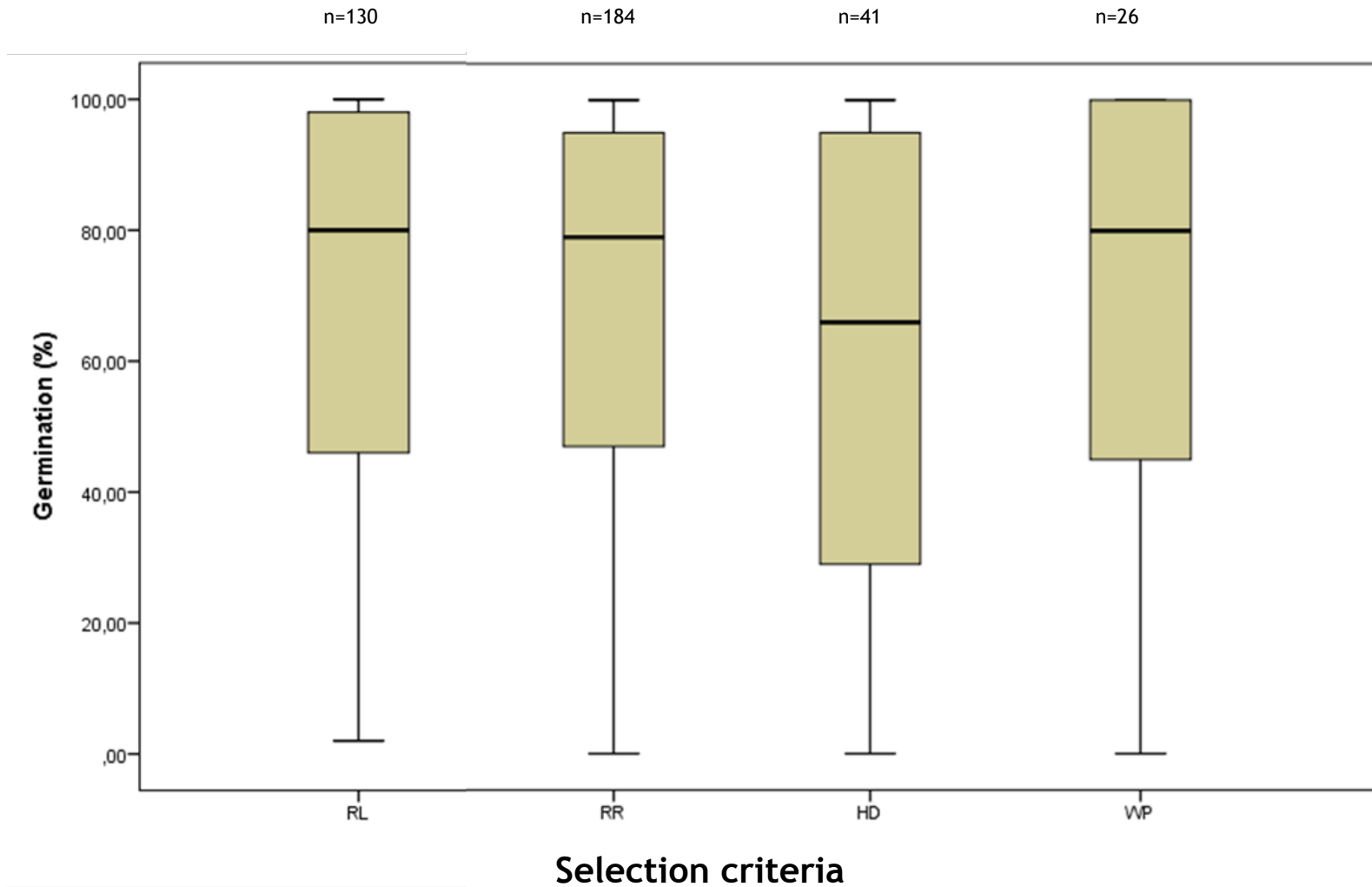


**Mean = 68.79%**

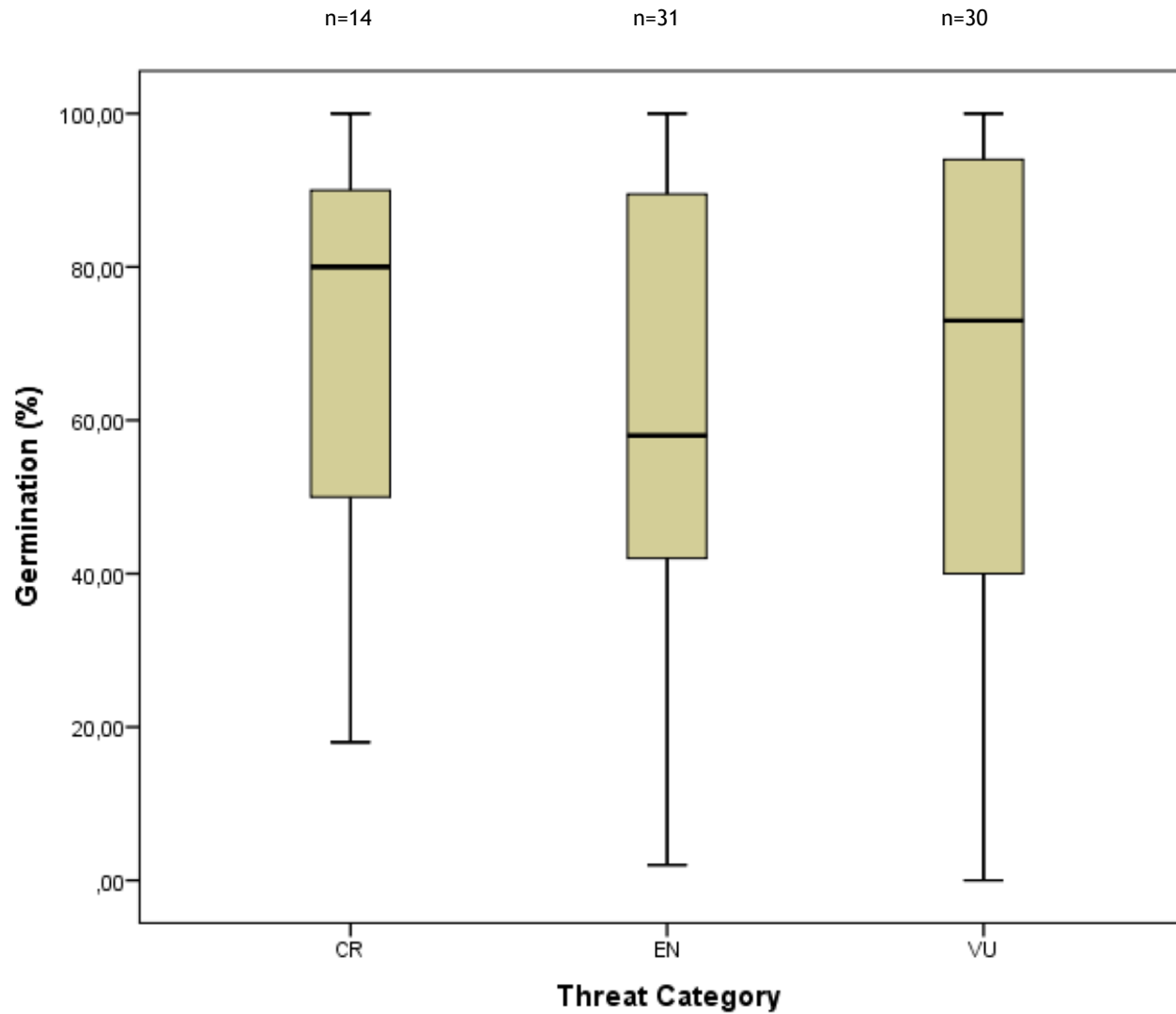
# Germination tests



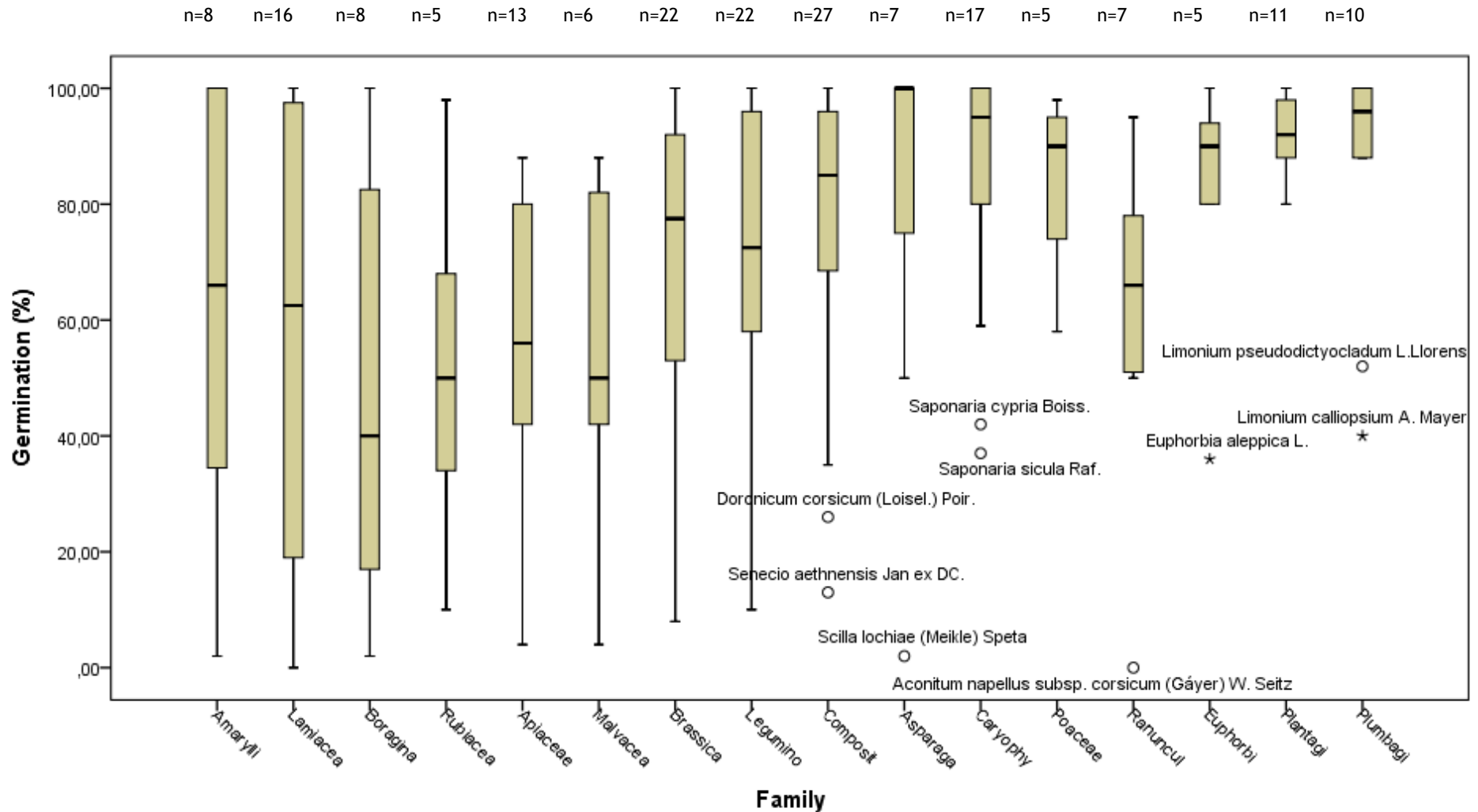
# Germination tests



# Germination tests



# Germination tests



# Training for *ex situ* conservation by CARE-MEDIFLORA partners in collaboration with IUCN-Med

- Five practical trainings for 7 scientists coming from Lebanon, Tunisia, Algeria and Morocco, have been successfully completed at the Sardinian Germplasm Bank (BG-SAR) in collaboration with the IUCN-Med (as part of the IPAMed project).
- The trainees were involved in *ex situ* conservation techniques focused principally on seed curation.
- Three practical trainings for 6 scientists from Palestine, Turkey and Lebanon had also been completed at the Mediterranean Agronomic Institute of Chania.





# Thank you for your attention

2nd Mediterranean Plant Conservation Week, La Valetta, Malta, 12-16  
November 2018

