Cities of Andalusia: Botanical and Horticultural Observations.

A group trip alongside Anna Lim, Fay Davies and Steph Li.

Written by Charlie Hunt, student of Kew Gardens.

Figure 1: Carpobrotus acinaciformis at *Europa Point lighthouse, Gibraltar*

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Thanks to Anna Lim, Fay Davies and Steph Li for company and sharing knowledge.

Introduction and Purpose of Trip:

The initial purpose for this trip was to gain practical and theoretical knowledge on the cultivation and curation of *Cactaceae*. Unfortunately, due to unchangeable and last-minute events, we were unable to be received for this training. With this news, and non-refundable travel, we made major adaptations to our itinerary to make best of being in Andalusia.

We adapted the trip into a tour of some of the cities of Andalusia, still including Gibraltar, to look at the Mediterranean gardens. Although unexpected, this change of plans turned out to immediately broaden my horticultural interest in areas I admittedly had not given too much thought to previously.

We visited Cordoba, Gibraltar, Malaga and Seville. Whilst in these places we visited botanic gardens, alcazárs, public parks and natural areas. Here we observed architecture, garden design, planting, street trees, native plants etc.



30th June: London / Malaga 1st-2nd July: Malaga / Gibraltar 3rd-6th July: Gibraltar / Cordoba 6th-7th July - Cordoba / Seville 8th-9th July: Seville / London

Figure 2: Locations of travel

Areas visited and purposes:

All of the areas we visited belong to the Spanish region of Andalusia. At the southern tip of Spain, it contains the regions hottest and driest climates. All cities visited belong to the warm Mediterranean climate, defined by hot and dry summers then mild winters with irregular rainfall, with an average year-round temperature of 18c, and 300 days of sunshine a year.

Malaga:

We began our trip in Malaga. Arriving late at night, the only room left in this day for any sort of botanical activity was observing street tree planting.



Figure 3: Dracaena draco at Malaga Botanic Gardens.

The next morning, we headed to Malaga's botanic garden, "Jardín Botánico -Histórico La Concepción". The garden is home to over 2400 taxa, some of which being species of other tropical and subtropical parts of the world, most grown outdoors. The garden has a history dating back to 1855, and was eventually acquired by the City of Malaga in 1990. The garden contains many areas such as a Palm avenue, *Plumeria* collection, cacti and succulent garden, large *Wisteria* arbour, fern conservatory, *Hibiscus* walk, forest walk/natural areas, and much more (see map in appendix). One section of the garden was named "Around the World in 80 Trees'. This, as the name suggests, featured a long red brick road planted with trees from all over the world. The project began in 1994, and trees are still added to this day, along with beautiful planting in between. The path had plenty of interpretations and plants were labelled with binomials and provenance, making it a very pleasant walk. *Chrysanthemum pacificum* was let sprawl as an ocean of small, thick, neat leaves in part of this walk.

Figure 4 (top left): **Ceiba insignis.** Figure 5 (top right): **Schefflera actino.** Figure 6 (bottom): **Chrysanthemum pacificum**



At the very back of the garden there is a woodland walk / natural area. Malaga falls into the "warm temperate thorn steppe biome" in the Holdridge life zones system of bioclimatic classification, and this could be seen at the edges of the garden, as purposeful planting faded into natural vegetation. Natural vegetation included at least plants of the *Lamiaceae, Asteraceae* and *Crassulaceae* families.



Figure 7 (top): **Petrosedum sediforme.** Figure 8 (middle): **Polygala sp.** Figure 9 (Bottom-left): **Rudbeckia sp.** Figure 10 (Bottom-middle): **Convulvulus althaeoides** Figure 11 (Bottom-right): **Glebionis coronaria**





The gardens also contained a beautiful selection of cactus and succulent beds, littered with *Agave, Aloe, Pachypodium, Dracaena,* and many *Cactaceae* and *Aizoacaeae*. These plants were in beds of a very high draining composition, making use of inorganics such as grit and lava rock to further the free-draining qualities of the local soil. They made good use of the limited space using sloped and winding paths, back down towards one of the palm avenues.



In order from left to right top to bottom: Figure 12: **Mammillaria albilanata.** Figure 13: **Graptoveria sp.** Figure 14: **Kleinia anteuphorbium.** Figure 15: **Agave** *victoria-reginae.* Figure 16: **Lampranthus spectabilis.**

We visited a public park in Malaga, known simply as Malaga Park. Founded in 1897, it is a 33-hectare green space by the seafront containing a botanical garden. The park is planted beautifully, adorned with fountains and sculptures as with lots of Mediterranean gardens.



What stood out to me with this public park was just how organised it was, with labels, interpretations, and even a map at the entrances with bed layouts, plant locations, etc. The gardens contained *Platanus* planted alongside palms such as *Bismarckia nobilis* and *Phoenix canariensis*, with scatterings of *Strelitzia*, *Agapanthus*, *Dracaena* and much more. The local council itemises the major plantings in this fantastic public botanical park (see appendix for park map and plant locations). It was great to see plants such as *Bismarckia nobilis*, *Strelitzia nicolai*, *S. reginae* and *Pandanus utilis* growing together outside happily. The Paseo del Parque main road divides this park into two, with crossings frequently placed. The park serves as a recreational area for locals and tourists alike to take shelter from the intense sun, but also to appreciate a green space and nature (captivated, but still so). Green spaces play a huge role in public health and escapism, and it brings hope to see this space has survived so long and is taken care of, with plenty of funding still making its way to the park.



Figure 17: Pandanus utilis.



Figure 18: One of the main paths



Figure 19: Myself and Steph Li dwarfed by and admiring a **Phoenix canariensis** Figures 17-19: Photographs taken by Fay Davies

Gibraltar: The Alameda

Onto Gibraltar. As stated previously, plans had fallen through, but things worked out. We arrived with the intentions to see The Alameda, get a tour of the gardens, and explore/botanise the natural area of Gibraltar, Gibraltar Rock. Things worked out when a friend of Steph's was in town, and offered to show us the flora of Gibraltar Rock. This, paired with a tour of The Alameda from their director, Keith Bensusan, and them giving us access to the laboratory, ensured Gibraltar was not a botanical hole in our trip.



Figure 20: The **Cactaceae** nursery of Gibraltar Botanic Gardens.

We were received by Keith Bensusan, director of The Alameda. Keith gave us a personal walkabout of the gardens, expressing his opinions, some future plans, and general history and information of the gardens. One of the current projects was rejuvenating the *Cactaceae* and succulent beds at the entrance of the gardens. The beds were being fully replaced with lava rock and replanted. Gibraltar is warm year-round, and hot in summers, however, receives relatively high rainfall and humidity over winter (see appendix for details on temperature/rainfall). For this reason, it is important that the beds are of the upmost draining capacity. When using pure mineral growing media, frequent liquid feeds are used to compensate for the lack of minerals in the growing media. I was fascinated by the decision of coppicing *Cactaceae* in the beds. I'd been aware of and practiced it on my own succulent collection, but only on seedlings. The idea with coppicing these *Cactaceae* at The Alameda being to produce more limbs at the cut, eventually leading to a fuller-bodied specimen. I love this idea of displaying *Cactaceae*. Of course, this method has limitations, and may only be feasible for fast-growing, columnar cacti.



Figure 21: Echinopsis sp. coppiced.



Figure 22: **Adenium obesum**

The Alameda is currently working on a display glasshouse. This glasshouse consists of 2 general climates, moist tropical and dry tropical. The displays are a work in progress, but look hugely promising, with the arid section having a shaped porous vertical wall, currently home to a beautiful *Adenium obesum*, nestled into a nook of the wall.

The *Cactaceae* behind the scenes at The Alameda were in exceptional health and meticulously organised. Due to the heavier rainfalls in winter in Gibraltar, these plants are grown in pure lava rock and fed via a liquid feed. This is a free-draining mix, but the lava rock will hold onto some moisture and feed due to the feeding method. The growing media ensures *Cactaceae* are not sitting with wet roots over the heavy rainfall months.



Figure 23: Copiapoa cinerea grown in The Alameda nursery.

Gibraltar: Rock of Gibraltar

We were lucky to meet Kian whilst staying in Gibraltar. Kian is a keen selftaught botanist and local flora expert who lives in Gibraltar and was keen to give us a walking talking tour of the flora of the natural area of the Rock of Gibraltar. The rock is a monolithic limestone promontory (A giant, singular rock projecting into the sea, made of limestone). The main ridge of the rock peaks at around 400m above sea level.



Figure 24: Limestone cliff face of the rock facing east.

Botanising the rock with Kian was a great experience. In hindsight, it would have been good to spend a few days here. There is so much to see and different routes to take. It was great to see how plants have been selected over the ages to withstand the climate. Typical Mediterranean plant adaptations could be seen here, such as reduced leaves, trichomes to capture/redirect moisture, and succulent leaves. We hiked a loop around part of the park, stopping regularly whilst Kian pointed out plants. Plants of note included: *Ephedra fragilis, Adiantum capillus-veneris, Lobularia maritima, Achyranthes aspera, Antirrhinum majus* and *Chamaerops humilis*.

Gibraltar: Point of Gibraltar

During some down time in the trip, I headed off from the group to see the southern-most tip of Gibraltar, to see the lighthouse (see report cover), but also to do a little botanising. The plants observed here were growing at the edges of the steep, sharp cliffs that plummeted into the Mediterranean Sea. The plants growing here were exposed to salty winds and intense sun, growing in a sandy alkaline soil with underlying limestone rock. Are these plants halophytic, xerophytic, lithophytic? Symptoms of all were present and merging.



sinuatum, Scolymus hispanicus.

Cordoba:



Figure : mosque-cathedral of Cordoba

Our next stop was Cordoba. It would have been a great waste to visit the cities of Andalusia and not take in the breathtaking and historical energy of the architecture, so I did take some time to just observe the old buildings of the city. Luckily, we got a two-for-one at the first garden we visited, attached to the Alcazar of the Christian Monarchs.

This Alcazar is a fortress and a palace with a formal garden in the walls. The garden contains many beds of straight lines and right angles, repetitive plantings (mainly drought-tolerant plants), fountains, sculptures, conifer



hedges, *Cupressus* avenues, rows of *Citrus*, palms, all complimented by each other and the architecture. This is the garden where I feel I emotionally understood, or at least, accepted and wanted to learn more about the more formal side of gardening.

Figure 26: Cordoba Alcazar. Photo credit – Ajay Suresh.

After exiting the communal areas of this Alcazar, you are led into the gardens. First you enter into a small rectangular courtyard, with the shorter sides of the rectangle heading east and west, longer walls heading north and south. On the north side there is a patio of sorts, with a shallow pool and minute fountains, to the south another patio which recesses under the roof of the Alcazar providing shade. These two areas of the courtyard presumably (before the place was a tourist attraction) providing areas to eat, socialise, shade from the sun, and clean water. The centre of the courtyard was beautifully planted in squares of straight-edged beds. A fountain stood in the middle of the courtyard, with tiered gutters made of stone, directing water to the beds (more on this irrigation system further on).

When we visited (July), the courtyard was a two-tone mix of a soft and chalky purple, and deep greens. The purples coming from *Trachelium caeruleum, Agapanthus sp.,* a purple *Amaryllis belladonna* cultivar, and the greens coming from the many *Citrus* trees planted. *Jasminum sp.* and *Capparis spinosa* lazily hung from the walls, providing white specks amongst wavy green drapes of leaves, contrasting the sandy walls.





Figures 27 & 28: Trachelium caeruleum close-up. T. caeruleum & Agapanthus planted amongst Citrus



The garden beds were watered via this guttering system, spread throughout the garden strategically. The gutters were placed at the highest point in the garden, harnessing gravity to meander its way through. By each bed there were small gates made of some sort of metal, which could be slotted into holders, to stop water from entering certain areas. This allows the garden to be watered selectively and (physically) effortlessly. Closing off beds that do not need water saves on water usage. In a climate like Cordoba's, smart water usage is incredibly important.

Figure 29: Irrigation at the Alcazar of Christian Monarchs.

Cordoba Botanic Gardens:

We spent a few hours exploring the botanic gardens in Cordoba. Unfortunately, the ethnobotanical museum was closed, and we couldn't find any horticulturists about to ask for a look in the nursery, but there was enough to see in the gardens to make it worthwhile.



Figure 30: Arid room of one of the glasshouses, photo: Kent Wang

For a small botanic garden there is much packed in. The garden contains two large glasshouses. One glasshouse having an arid, temperate and tropical zone. The other has many rooms such as "Canary Island Flora", a fern room, and an old-world succulent flora room. There is also an ethnobotanical museum along with a museum of palaeobotany. A shade house has been built to accommodate tree ferns that require more moisture than the Andalusian climate can provide. Had we known we would end up visiting this garden, we would have tried to arrange a tour with one of the gardeners here.

Seville:

In Seville we visited two places of horticultural interest, the royal Alcazar of Seville and Parque de Maria Luisa.

The Alcazar is the oldest active royal palace in Europe, with buildings showing off extreme architectural beauty. Due to aniconism within Islam, the buildings feature geometric patterns which while still beautiful in pictures, need to be experienced in-situ to fully appreciate their grandeur and presence.

The gardens here varied from walled formal gardens, to arboretum, fruit trees, a maze, many fountains, and sculptures, contained by towering defensive stone walls.



Figure 31: **Punica** hedges, towering **Phoenix**, **Citrus**. Much of the garden surrounding the buildings were of a similar style to this. Small symmetrical planted islands surrounded by **Punica** hedge, usually containing **Citrus**, **Pheonix, Cycas,** underplanted with drought resilient plants such as **Agapanthus** or **Amaryllis.**

Parque de Maria Luisa

This is a public park in Seville that runs along the Guadalquivir River. Formally palace gardens, they were given to the city in 1893. It is a green space of 40 hectares. Keeping consistent with most of the gardens visited during this trip, it was full of drought-resilient planting, structures such as pergolas and other shade structures, well-maintained hedges (*Buxus, Punica*), fountains and sculptures. There are some long avenues planted with plane trees, *Eucalyptus, Cupressus,* and more avenue-worthy trees which provide shade from the intense Seville sun, as well as shortcuts through the park. The park is said to house around 140 species of trees, including *Jacaranda, Ginkgo,* but also more typical plantings of *Bougainvillea, Amaryllis, Agapanthus, Salvias,* and many palms and cycads.



Figures 32-34: Some points of interest.

Reflections:

I feel this trip has benefited me in many ways.

Seeing Mediterranean flora in-situ, looking at their adaptations, growing conditions, and surroundings, will help me be a better grower of plants from this climate.

Botanising in Gibraltar's natural area and the southern tip has helped me improve plant identification skills.

Experiencing the gardens here has had a big impact on my current interests as a gardener. It has made me want to learn more about the practical and design skills required to create and maintain these sorts of gardens. I felt at home in these gardens. While I'm sure it was partly to do with the hot and sunny weather, it was the plants combined with often very neat and symmetrical plantings, the avenues of tall and tight *Cupressus*, soft colour schemes and sometimes haunting sculptures, accompanied by soft trickles of water in a dry space. I would like to go on to gain more knowledge in this area of horticulture.

After this trip my intentions were to carry on looking into plants adapted to similar environmental conditions as plants seen in this trip: intense sun and low moisture, xerophytes. I have carried this on by taking work leave and funding my own trip to Teide National Park and Malpais de Guimar in Tenerife, to observe the flora in these areas in September 2023. This was a solo trip consisting of hiking out into natural areas and observing plants and their environmental conditions, of which I have gained a good amount of understanding into some more xerophytes and their growing conditions.

I intend to carry on this exploration of xerophytes however and whenever I can. The adaptations of plants in xeric environments is fascinating and marvellous. Observing these plants in-situ is key to understanding how to grow them exsitu. For this reason, I will attempt to carry on observing plants in-situ wherever my capabilities allow, and apply my personal observational knowledge to established horticultural knowledge of others and myself, in order to better understand and contribute to the cultivation of xeric plants.

Areas of interest for future in-situ observations: Oman, Soqotra, Chihuahua Desert, Namaqualand, Canary Islands.

References and appendix:

References: https://en.climate-data.org/europe/spain/andalusia-252/ https://laconcepcion.malaga.eu/en/ https://laconcepcion.malaga.eu/export/sites/botanico/.galleries/DOCUMENTO S-Documentos-general/Garden-map.pdf https://www.survivingmalaga.com/around-the-world-in-80-trees/ https://parquedemalaga.wordpress.com/trees-of-interest/ https://en.climate-data.org/europe/gibraltar/gibraltar/gibraltar-27772/

Appendix:

Holdridge life zones system of bioclimatic classification:



Malaga botanic garden map:



HISTORICAL GARDEN

- HISTORICAL GARDEN

 Entrance. Information. Shop: Bar
 Augustic Plants
 Plant: New Work
 Loring Mussum and the Ewedra
 Loring Mussum and the Ewedra
 Loring Mussum and the Ewedra
 The Little Theatre. Amalia Horeda Bust
 Loting Mussion. Tennis Court
 Waterghal with Moterosis
 Waterghal with Moterosis
 Araucala heterophylla
 Kimphol Sculpture and Stream
 Rafet Echovaris Waterghal
 Consulter Anteres Querten
 Falling Avenue. Planters Collection
 Loring Ansino.
 Loting Ansino

COLLECTIONS, ROUTES AND POINTS OF INTEREST

COLLECTIONS, ROUTES AND POINTS OF INTE Viewpoint Route Administrator's House, Exhibition Room Weld around the work in 80 trees Little Cypres: House, Seat of Friends' Association Cold Schoolhouse Branch of the San Tehmo aqueduct The Cid Threshing Floor Contensing Olive Tree Malage Vines Plants Collection Coroup of Canifers Palms Collection Ancient norsia Recue listics 'Decara' Malage Vines Plants Collection Alberca of the carnations Colling finds hortus Bamboo Collection

Gardener's Lodge (Dal's exhibition) Historical Creanhouses The Stone Ponds Primitive Plants Mediterranean Rockery Greenhouse with Insectivorous Date Palm Walk The Garden of Sense. Collection of Trait trees and Climbers Gate Forest Roate Bird Observatory

- OFC. The element of surprise that characterizes the parden's design makes getting lost part of its characterizes and the second seco

ROUTE SUITABLE FOR WHEELCHARS. EASY TO WALK FOREST ROUTE Medium difficulty, 1,100 m long. × REST AREA Food may be consumed.

Malaga public botanic park map:



Malaga public botanic park plant list:

- 1. Dracaena draco
- 2. Kigelia pinnata
- 3. Erythrina caffra
- 4. Phoenix dactylifera
- 5. Roystonea olecacea
- 6. Howea fosteriana
- 7. Caryota urens
- 8. Howea belmoreana
- 9. Ceiba pubiflora
- 10. Caryota mitis
- 11. Quercus robur
- 12. Acrocomia aculeata
- 13. Pritchardia hillebrandii
- 14. Brunfelsia calycina syn. pauciflora
- 15. Brahea armata
- 16. Peltophorum dubium
- 17. Dombeya x cayeuxii
- 18. Quiscalis indica syn. Combretum indica
- 19. Quercus ilex
- 20. Podocarpus nerifolius
- 21. Encephalartos laurentianus
- 22. Cycadaceas zamiaceas (C.revoluta, C. circinalis throughout/a lo largo del Parque)
- 23. Meryta denhamii
- 24. Arenga engleri
- 25. Ptychosperma elegans

- 26. Syragus romanzoffiana
- 27. Butia capitata, Butia bonnet, Butia yatay,
- 28. Murraya paniculata
- 29. Strelitzia Nicolai, Strelitzia reginae
- 30. Roystonia regia
- 31. Brachychiton acerifolium
- 32. Pheonix rupicola
- 33. Bauhinia purpurea
- 34. Diospyros fasciculosa
- 35. Pinus canariensis
- 36. Schefflera elegantissima
- 37. Ginkgo biloba
- 38. Araucaria columnaris
- 39. Alpinia zerumbet
- 40. Magnolia grandiflora
- 41. Chamaedorea costaricana
- 42. Persea americana
- 43. Trevisia palmata
- 44. Ravenea rivularis
- 45. Araucaria bidwillii
- 46. Ravenala madagascariensis
- 47. Citharexylum spinosum
- 48. Caryota gigas
- 49. Bismarckia nobilis
- 50. Spathodea campanulata
- 51. Montanoa bipinnatifida

- 52. Macadamia ternifolia
- 53. Archontophoenix alexandrae
- 54. Dypsis lutescens syn. Chrysalidocarpus lutescens
- 55.Pandanus utilis
- 56. Taxodium mucronatum
- 57. Jacaranda mimosifolia
- 58. Tetraclinis articulate
- 59. Alocasia odora
- 60. Livistona chinensis, Livistona sabirus
- 61. Plumeria rubra
- 62. Beaumontia grandiflora
- 63. Grevillea robusta
- 64. Celtis australis
- 65. Phoenix reclinata
- 66. Dypsis decaryi
- 67. Ficus carica
- 68. Monstera deliciosa
- 69. Cephalotaxus harringtonia
- 70. Dracaena reflexa
- 71. Casimiroa tetrameria
- 72. Archontophoenix alexandrae
- 73. Platanus x hispanica syn. orientalis throughout Paso de los Curas.
- 74. Morus alba
- 75. Phoenix roebelenii
- 76. Araucaria heterophylla syn. A. excelsa
- 77. Brachychiton populneum

- 78. Datura x candida syn Brugmansia x candida
- 79. Musa cavendishii
- 80. Ceratonia siliqua
- 81. Eucalyptus polyanthemos
- 82. Sabal blackburniana
- 83. Acer negundo
- 84. Bambusa vulgaris
- 85. Cereus peruvianus (in poor condition/en mal estado 2013)
- 86. Yucca elephantipes
- 87. Copernica alba
- 88. Beaucarnea recurvata
- 89. Bignonia amarilla syn. Tecoma stans
- 90. Livistona nitida
- 91. Acer saccharinum
- 92. Dracaena sanderiana or syn. D. fragrans.
- 93. Pachira aquatica
- 94. Deutzia x magnifica
- 95. Washingtonia robusta
- 96. Brahea brandegeei
- 97. Ligustrum lucidum
- 98. Harpephyllum caffrum
- 99. Megaskepasma erythroclanys
- 100. Acoelorrhape wrightii
- 101. Callistemon viminalis
- 102. Zapoteca portoricensis
- 103. Acalypha wilkesiana

104. Livistona australis

105. Chamaerops humilis

106. Ficus elastica

107. Pittosporum tobira (repitido a lo largo del Parque/repeated through the Park)

- 108. Livistona beuthamii
- 109. Cupressus sempervirens
- 110. Erythrina speciosa
- 111.Taxus baccata
- 112. Rhapsis excelsa
- 113. Washingtonia filifera
- 114. Ziziphus mauritiana
- 115. Coccoloba uvifera
- 116. Schleflera actinophylla
- 117. Doryanthes palmeri
- 118. Fucrea selleoana
- 119. Sterculia monosperma syn. nobilis (formerly coccinea).