# ALWIN BERGER, CURATOR OF THE HANBURY BOTANICAL GARDENS AT LA MORTOLA

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ABSTRACT
Alwin Berger (1871-1931) spent eighteen years at La Mortola as Curator (1897-1915). We outlined his contribution to development and displays of scientific collections of the garden analysing some original historical documents. A selection of original botanical photographs made by A. Berger was included here.

KEY WORDS
Alwin Berger, curator, horticulture, scientific collections, Hanbury Gardens

## INTRODUCTION

German botanists and scientists made an important contribution in the development of the garden of La Mortola since the early years: Daniel Hanbury had built close connection with academics as Friedrich Flückinger, and until the First World War the curators and administrators of the garden were usually Germans: L. Winter, G. Cronemayer, K. Dinter and Alwin Berger. La Mortola owes much to the teuctonic tradition of systematic botany and flair for horticultural administration (Quest-Ritson, 1992).

Thomas Hanbury's intentions were twofold: first to undertake serious scientific experiments in acclimatisation, and second to make a collection that was both useful and instructive (Quest-Ritson, 1992). Since the 1880, the scientific value of La Mortola as subtropical botanical garden became more evident: a small botanical Museum, a herbarium of cultivated and indigenous plants and a library equipped with the most necessary botanical works, chiefly on systematic and geographical botany. Since 1893 the *Index Seminum*, a list

of seeds offered in exchange, for private circulation only, was printed and distributed to all Botanic Gardens and many other correspondents. In 1893 Sir Joseph Hooker, Director of Kew Gardens, dedicating the 119th volume of the Curtis Botanical Magazine to Sir Thomas Hanbury wrote " .. as a tribute to the value of your services to Scientific Horticulture, in creating a garden of Exotic plants at Mentone, which, in point of richness and interest, has no rival amongst the principal collections of living plants in the world..".

Alwin Berger was appointed Curator of La Mortola Garden in 1897, following on from Kurt Dinter and attended this mansion to 1915, when the war forced him to return in Germany. In 1897, he was a young man with excellent credentials and considerable experience as gardener and horticulturist. A. Berger (1871-1931) was born at Möschlitz, near Schleiz, in Thuringia. He attended school in Schleiz and Reutlingen at the "Pomologisches Institut", and began his career in gardening at Eberdosdorf at the as apprentice, where he learned to know and to grow tropical plants in the greenhouses. Later, he worked in several German botanic gardens: Dresden, as assistant (1890), where he knew Kurt Dinter; Freiburg (1891), with the director Prof. Friedrich Hermann Gustav Hildebrand; Karlsruhe (1893), with Leopold Gräbner. In 1894 he worked as horticulturist in the nursery of Uberto Hillebrand in Pallanza, Lago Maggiore; in 1896 at the Botanic Garden of Greifswald, director Prof. Tischler. 1897 Botanic Garden Giessen, and in 1897 Palmengarten, Frankfurt – Main.

During his eighteen years at la Mortola not only he attended to the mansions of the curator but seizing the opportunity offered by the richness of succulent plant collections, he began a large publishing output of papers and books on succulents, to whom other specific contribution is dedicated (Metzing, 2017).

## METHODS

To outline Alwin Berger's contribution to the development of the garden during his years at La Mortola, we analyse some original historical

sources of Hanbury Archives, property of the Italian State and currently kept for the most part at the Istituto Internazionale di Studi Liguri in Bordighera, Fondo Hanbury (henceforth IISL-FH), and, in part, at the Hanbury Botanic Gardens in Ventimiglia (henceforth GBH-FH).

In particular, we consider the manuscripts: "*Sowing & Planting*"/"*Semi e piante*" vols. 6, 7, 8 (1896 – 1907) (IISL-FH), registers in which the curators or others collaborators carefully daily recorded the arrival of seeds, plants, cuttings from every part of the world.

Hanbury Archives preserve also a collection of Alwin Berger's correspondence with botanists, horticulturists from different parts of the world; it consists of five folders containing mainly letters, postcards, and manuscripts from 1888 to 1914 (IISL-FH).

Among the historical photograph found of the Hanbury Archive we have a collection of botanical photographs made by Alwin Berger, concerning both single living specimen of plants, and groups of plants, made mainly at La Mortola, but also in the neighbour sites (Viale, 2011).

We consider also the catalogue of the plants growing in the garden *Hortus Mortolensis. Enumeratio Plantarum in horto mortolensi cultarum*, compiled by Alwin Berger and published in 1912, as well as his numerous scientific papers and contributions on the *Gardener's Chronicles*.

The Elisa Berger's Memoir: "Elise Berger. Life memories. The Italian edition of an unpublished diary on Alwin Berger life" let us to know many details about his work in the garden (Berger, 2016).

## THE CURATOR'S ASSIGNMENTS

During his years of apprenticeship and work in Germany, Alwin Berger had acquired a good training in caring exotic plants cultivated in greenhouses, and in systematic botany. In the "Letters of references copies of testimonials (translation)" (IISL-FH), we read the portrait of a clever and diligent young man; G.A. Poscharsky, inspector of the Royal Botanical Garden Dresden, on 29th December 1891, wrote "*he has have*

*the same in care plants of the warm and cold house, also succulents and cultivated these plants with perfect contentedness…he has employed his free time to his perfection in the systematic botanic*"; A. E. Eibel, inspector of the University Botanic Garden of Freiburg, on 5th August 1893, certified that "*he* [A.B.] *had in culture the tropical Orchidaee, Filices, and the better warm and cold house plants*…."; Gräbner, director of the Court Garden Karlsruhe, wrote " *he* [A.B.] *was principal employed in the systematic department of our institute. He appeared particularly qualified for this branch by his good systematic knowledges*".

On 18th May T. Hanbury wrote: "*The accounts I have received concerning you are so satisfactory that I have decided to give you the position of Curator to my Garden here, being the post just vacated by Mr. K. Dinter… You will have a good furnished cottage and a salary of Lire 125 per month to begin from the day you arrive here, and I shall pay for your railway ticket in traveling here. I wish you to come via Genoa and to call on Prof. Penzig at the Orto Botanico, R. Università there. Other privileges enjoyed by Mr. Dinter you will also have, such as firewood, vegetables, oil for your lamp, and the washing of your linen. You are however expected to bring your own pillow, sheets, blankets and table linen also knives forks and spoons.*

*The agreement is to continue subject to three months notice on either side. You will please write to me before starting saying whether the above is satisfactory and whether you agree to it, I will then tell you when to start."* (Berger, 2016).

In his letter of 22nd May 1897 to Sir T. H., Berger accepted the position of curator, and wrote "*as respect to Mr. Salvai* [the head gardener's], *I hope to find a man of great experience in gardenculture and on my part you shall not have to fear frictions and jealousy and this more as my position as curator is the first in the garden , with the general purpose of the scientific part. ……For this I promise you the greatest care of all things, expecially for the reputation of the garden in a scientific*

*view…..My arrival would take place for the most conveniently the 15th of June and I ask you very much to put it on this day…*".

On 25th May T. Hanbury answer: "*The 15th June is a date quite suitable for you to arrive so far as the garden is concerned but in all probability I and my family will have left for our accustomed absence in England during the summer so that I should not make your personal acquaintance till I return in the autumn unless I can plan for you to meet us en route*".

As curator of the garden was charged of the supervision of the garden, with the collaboration of the head gardener. He was also responsible for cataloguing and labelling plants; the exact recording of all the new entrances, the editing of *Index Seminum*; for the correspondence with the different botanical gardens and with different lovers of the plants all over the world; for care of the library and herbarium.

Elisa Berger (2016) wrote: "*For the father* [A.B.] *was beginning the most beautiful period of his life. From morning to night he walked through the large and magnificent garden. He often stopped silently admiring the beautiful plants. The impressive aloe and agave, once known as miserable seedlings, awakened his enthusiasm and fascinated him incomparably. At that time, only the agaves were blooming. Moreover opuntias, with their yellow and red flowers, bright as silk, hooked him.*

*Every week the father* [A.B.] *sent his letter to Mr. Hanbury. At first, it was difficult to draw up a detailed report in English. Mr. Hanbury returned these correct reports in the most meticulous manner. Since we have this correspondence, you can convince yourself at any time of the enormous progress made by your father in a short time.*

*On Sundays and holidays, the father* [A.B.] *made excursions in the beautiful surroundings and especially in the mountains.*

*A few weeks after his arrival he came to visit Karl Sprenger, co-owner of Dammann & Co. of Naples, whose contributes on various specialized magazines were well known to the father* [A.B.]...

*It was during this time that Carl Ludwig Sprenger (1846–1917), partner at Dammann & Co., horticultural house in Naples, Italy, suggested Berger study succulent plants more in detail.*

*.....Sprenger, with his impulsive style, put both hands on A.B shoulders: "Here, Mr. Berger, he has been offered the best opportunity to make useful studies. From Salm Dyck's time no one has been busy studying these interesting succulent plants with precision: do it: here you can find everything you need, follow my advice and we will be all grateful to you. Take care of succulent and cactacee and your time at La Mortola will be well spent* ".

Already in 1890, in the botanical garden of Dresden, A.B. took care of the cactacee; *he often told us how to observe them with curiosity, but without admiring them in a particular way. But what were the little seedlings, grown miserably in jars, compared to what was offered here, in the wonderful garden of La Mortola! He picked up Sprenger's stimulus immediately. From that day on, the succulent study became his main field.*

*Now the most harmonious part of coexistence and work began. Day by day they walked through the magnificent garden. New plantations were planned, the necessary changes were discussed and for the father it was a pleasure to wander around with Thomas Hanbury and discover interesting things about the origins and origin of so many precious and rare plants as Thomas Hanbury was secretly delighted to having finally obtained such a passionate and talented curator. What a difference between Berger and Dinter! With the latter they had almost never exchanged a word of friendship! During the following years the relationship between father and Thomas Hanbury became more and more intimate and close, until eventually Thomas Hanbury could no longer do without his father even for an hour. He had to be ready when Thomas Hanbury called him from the marble terrace, because then his father's museum was in the palace.*

INTRODUCTIONS OF PLANTS, RECORDING ALL THE NEW ENTRANCES.

In the preface of *Hortus Mortolensis* A. Berger wrote "*the introduction of new plants has been continued, and all the available land has been more intensively cultivated and planted"*.

Every new entrance was timely recorded in the registers "*Sowing & Planting*" with date of entrance, origin (institution or name of the contributor and place of origin), status (plant, seed, cutting, and bulb) and quantity of the plant material.

Some examples of the records from *Sowing & Planting Vol.6*:

- 9th March 1898 from Hillebrand Pallanza, plants [a list of 24 taxa of ornamental plants and bulbs].
- 14th March 1898 from P. Ruschpler, Dresden, plants, 10 *Rosa Crimson Rambler*, 5 *Rosa lawrenziana*… *R.* 'Crimson Rambler' (Hybrid Multiflora), bred by an unknown Japanese breeder before 1893, was introduced in United Kingdom by C.Turner in 1893 as 'Turner's Crimson Rambler'. The name was soon shortened to 'Crimson Rambler'. *R. lawrenziana* was perhaps *Rosa lawranceana*, a binomial employed by several authors to describe the smallest species of the genus, miniature roses, everblooming, and with many variants.
- 29th June 1898, from Franz Ledien, Botanic Garden Dresden, bulbs of *Tecophylaea cyanocrocus* [the Chilean blue crocus, a flowering perennial plant native to Chile].
- 2nd April 1898, from Southern California Acclimatizing Association, Santa Barbara, seeds [a list of 41 taxa most of which trees and shrubs native of California, among them, *Cupressus guadalupensis*]. *C. guadalupensis* is cited in *Hortus Mortolensis* and an old specimen is planted in Hanbury Botanic Garden.
- 30th April 1898, from Söhrens, director of the Botanic Garden of Santiago, Chile, plants and bulbs; *Cereus chilensis eburneus* Colla, *Echinocactus curvispinus* Colla, *Eulychnia acida* Filippi, bulbs of *Tecophylaea cyanocrocus.*

- 21st Nov. 1898 from Southern California Acclimatizing Association, Santa Barbara, seeds, *Quercus douglasii*. Blue Oak [sclerophyllous oak endemic to Sierra Nevada, California].
- 8th Nov 1898 from Dr. Dieck, Zöschen bei Merseburg, plants, 2 *Rosa gallica var. damascena trigintipetala*, 2 *Rosa gallica var. conditorum, 2 R. indica semperflorens flore simplici…, 2 Rosa gallica x multiflora* [and some botanical roses]. *R. x damascena* 'Trigintipetala' and *R. gallica* 'Conditorum' were introduced in Germany in 1889 by G. Dieck, the last one had just been obtained by G. Dieck; all them are recorded in *Hortus Mortolensis.*

From *Sowing & Planting* Vol. 7:

- 25th Dec. 1898 from Comm. Th. Hanbury, seeds: *a Collection of seeds from the high mountain of Tibet* [no names].
- 25th Dec. 1898, from Paul Reschpler, Dresden, plants [a list of 32 garden and botanical roses, among which *R. multiflora* and its varieties].
- 5th April 1899 from Miss Willmott Gt Warley [UK], plants [a list of 160 plants, among which *Mesembrianthemum*, cactus, many botanical *Pelargonium* and cultivars].
- 22nd October 1899 from Kew seeds of *Hesperoaloe engelmanni* x *Yucca recurvifolia* Hort. Kew. 1899.
- Oct. 1900 from Missouri Botanical Garden, seeds in exchange collected by Trealase: *Samuela carnerosana, S. faxoniana, Yucca constricta (helata), Y. constricta (caulescent), Y. macrocarpa Torr., Y. rigida* Engel., *Y. rostrata* Engelm. [with date and location data]. *Samuela carnerosana* is the only species still alive, among *Yucca constricta*, *Y. rigida* and *Y. rostrata* cited in *Hortus Mortolensis*.
- Jan 1901, from Dr Weber, Paris, seeds of *Opuntia cardona* Web., *O. macrorhiza* Engelm., *O. streptacantha* Lem. *Pilosocereus. pringlei* Web., *Opuntia spec. "amarilla de Zacaticas" excellent fruit jaunes (group de Ficus indica), Opuntia spec. "blanca de Zacaticas" excellent fruit blancs (group du Ficus indica),* and *A. lechuguilla* [with location data]. Fig. 1.

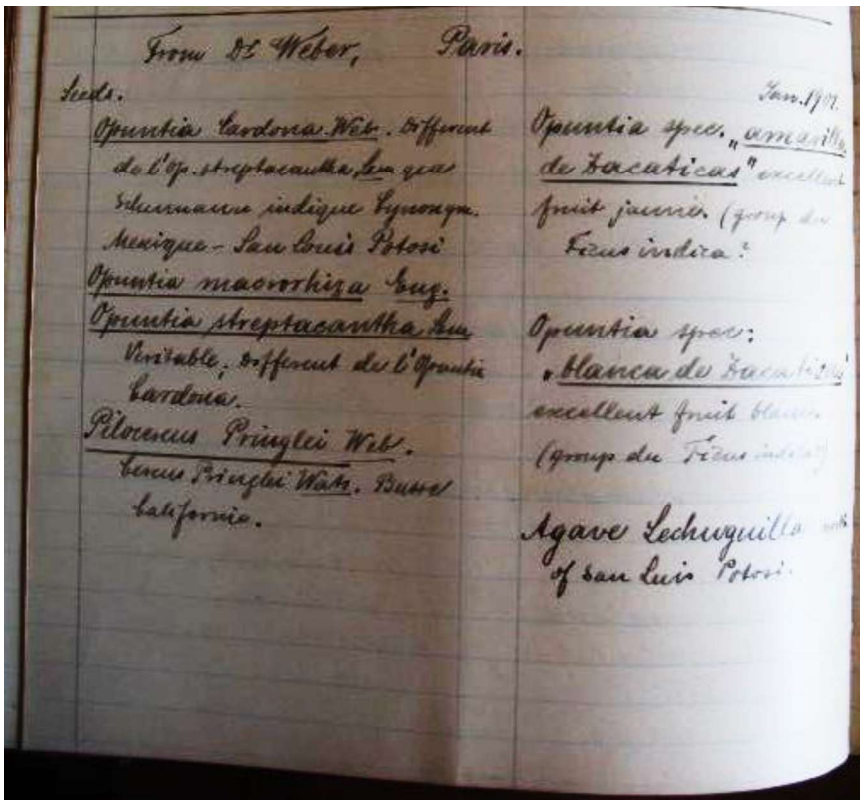



Fig.1. Record Jan 1901, from Dr Weber, Paris, seeds. Sowing & Planting 7, IISL-FH.

- 8 May 1901 from Mr Dorrien Smith Scilly Island, plants in exchange…. Among these, *Puya chilensis*, cited in Hortus Mortolensis and still alive in Hanbury Botanic Gardens.
- 30th June 1901, from Dr. Weber, Paris, plants of *Agave heteracantha f. glomeruliflora Engelm. from the author authentic specimen). Texas. Epiphyllum russellianum. Agave Mexicana. Opuntia leptarthra Web. Mexique spec. nova O. curassavicae affinis. Opuntia quipa Web., Pernambucco. Op. spegazzinii Web. sp. nov. Op. Salmianae affinis.* Fig. 2.

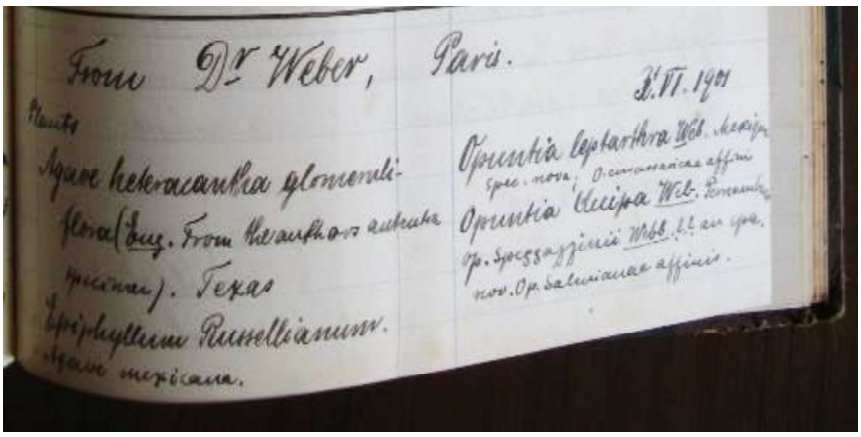
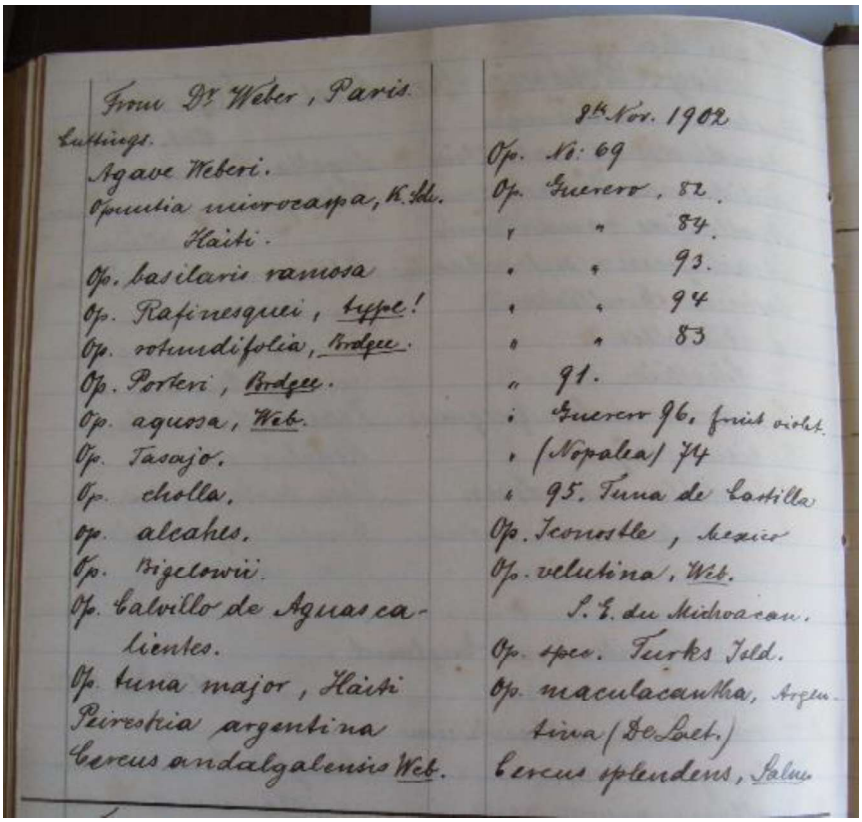



Fig. 2. Record 30th June 1901, from Dr. Weber, Paris, plants. Sowing & Planting 7, IISL-FH.

- 20th June 1902 from Dr. Weber, Paris, *Agave tequilana.*
- 8th Nov. 1902 from Dr Weber Paris, cuttings *Agave weberi*….[follow a list of species of *Opuntia*, among which several samples without names]. Fig. 3.

From *Sowing & Planting* Vol. 8*:*

- 7th Oct 1903 from Mr Frantz De Laet, Contich [ Belge]. Plants in exchange [A list of 27 *Cactaceae Opuntia, Echinocactus, Cereus, Rhipsalis* and 6 Opuntias sent to A.B. to be named].
- August 1906 from W. Weingart, plants, *a collection of over 80 numbers of rare and new cactaceae, about these in letter, many of them still to be determined*.
- 16th Nov. 1906 From Dr J. N. Rose, Washington, *2 plants of Beschorneria spec. (n. 19259) recently collected in the valley of Mexico at an elevation of abut 10,000 feet. by Dr. Rose and Pringle*. 10th Dec. Fig. 4.
- 10th Dec 1906, from Dr. Marloth, Cape Town, *Mesembrianthemum 5 spec., unnamed.*


From Dr Weber, Paris.
Cuttings.
Agave Weberi.
Opuntia microcarpa, K. Sch. Haiti.
Op. basilaris ramosa
Op. Rafinesquei, type!
Op. rotundifolia, Bridges.
Op. Porteri, Bridges.
Op. aquosa, Web.
Op. Tasajo.
Op. cholla.
op. alcahes.
Op. Bigelowii.
Op. Calvillo de Aguascalientes.
Op. tuna major, Haiti
Peireskia argentina
Cereus andalgalensis Web.

8th Nov. 1902
Op. No: 69
Op. Guerero, 82.
" " 84.
" " 93.
" " 94
" " 83
" 91.
" Guerero 96. fruit violet.
" (Nopalea) 74
" 95. Tuna de Castilla
Op. Iconostle, Mexico
Op. velutina, Web. S. E. du Michoacan.
Op. spec. Turks Isld.
Op. maculacantha, Argentina (De Laet.)
Cereus splendens, Salm.

Fig. 3. Record. 8th Nov. 1902 from Dr Weber Paris, cuttings. Sowing & Planting 7, IISL-FH.

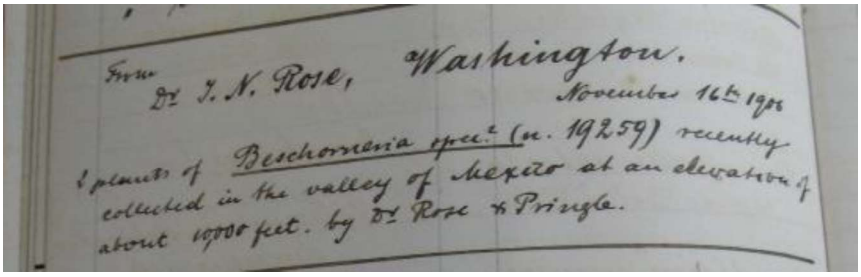

From Dr J. N. Rose, Washington.
November 16th 1906
2 plants of Beschorneria spec.? (n. 19259) recently collected in the valley of Mexico at an elevation of about 10000 feet. by Dr Rose & Pringle.

Fig. 4 record 16th Nov. 1906 From Dr J. N. Rose, Washington, 2 plants of *Beschorneria* spec. Sowing & Planting 8, IISL-FH.

In the preface of *Hortus Mortolensis* Berger mentioned a long list of contributors of plants and seeds during those years; among them we remind botanists such as:

- Dr. Nicholas Edward Brown (1849–1934), English botanist at Kew specializing in African succulents;
- Prof. Ernst Heinrich Philipp August Haeckel (1834–1919), german evolutionary biologist in Jena;
- Dr Hermann Wilhelm Rudolf Marloth (1855-1931), German botanist, chemist and pharmacist, living in South Africa from 1883;
- Carl A. Purpus (1851-1941), German botanical explorer of Mexico end the W of USA, brother of J. A. Purpus;
- Joseph Anton Purpus (1860-1932), German horticulturist in St. Petersburg and Darmstandt;
- Dr. Joseph Nelson Rose (1862–1928), US-American botanist in Washington D.C. and eminent specialist on Cactaceae and American Crassulaceae;
- Dr. Ernst Camillo Karl Schneider (1876–1951), German botanist, garden architect, horticultural journalist in Berlin;
- Prof. William Trelease (1857-1945), US-American botanist, director of the Missouri Botanical Garden from 1889 to 1912;
- Dr. Frédérick Albert-Constantin Weber (1830–1903) French military surgeon and amateur botanist strongly interested in cacti and agaves;
- Dr. Richard Wettstein (1863–1931), Austrian botanist in Vienna.

Among the gardens owners we cite Ellen Willmott (1858 –1934), English horticulturist, gardener, botanist, owner of famous gardens as Warley Place (UK), and Villa Boccanegra (Ventimiglia, I).

Among the Horticolturists:

- Dr. Georg Dieck (1841-1925) botanist, farmer and nursery owner; his collection of 450 Wild Roses was showed at the World Exhibition in Paris in 1908 and was then moved to Sangerhausen in 1909;
- Frans de Laet (1866– 1928), Belgian succulent plant expert and horticulturist in Contich (Kontich);

- Carl Ludwig Sprenger (1846–1917), partner at Dammann & Co., horticultural house in Naples**;**
- Paul Ruschpler (1832-1888), rose breeder and propagator, nursery owner at Dresden-Strehlen;
- Haage und Schmidt, nursery in Erfurt, Germany.

The complete analysis of all these accessions data is in progress and will improve our knowledge about traceability of the present living botanic collections.

RELATIONSHIPS WITH BOTANIC GARDENS AND BOTANISTS: *INDEX SEMINUM* AND BOTANICAL CORRESPONDENCE.

Every year the Curator elaborated the *Index seminum*. The first edition signed by A. Berger was in 1897, with 1670 different seeds and many cuttings of succulent species offered in exchange for a list of *Desiderata* that included "*Cistineae. Cistus, Elinathemum, Hudsonia*. *Proteaceae. Succulents. Agave, Aloe, Apicra, Haworthia, Gasteria, Yucca, etc. Euphorbia, Asclepiad, etc., etc. Trees & shrubs of extra-tropical countries, especially such as enumerated in Baron Muellers "Select Extratropical Plants", plants of mediterranean regions.*

The list of *Desiderata* give us an idea of the developing objectives of the Garden in that period.

Besides the annual distribution of seeds, fresh and dried material has been liberally sent to many laboratories, and students have been freely admitted to the garden.

Since 1900 they started to note regularly weather reports on special forms and registers.

Seeds and plant were distributed to almost every botanical establishment in the world, and to many private gardens, in increasing numbers. Many Colonial, Agricultural, and Forestry Departments send requests for them, and many new botanical gardens become indebted to La Mortola. In 1900, 6378 packets of seeds were sent out; in 1901, 7837; in 1902, 9331; in 1908 they numbered 13.085.

Alwin Berger cared the correspondence with Botanic Gardens, botanists, plants collectors, that offered and asked for seeds or plants, following the *Index Seminum*. This correspondence collection consists in hundreds of letters, notework, postcards, lists of plants; the documents are is a reach and extensive botanical resource, particularly for the traceability of the living and *exsiccata* collections and for the field of taxonomy; it is also a valuable historical resource. We know that not all his botanical correspondence is included in this collection.

The inventory of these documents is ongoing; as example, we transcribed here a selection of the letters, in chronological order, with, year, author, address, town and country of origin, object or plants mentioned in the letters (key words).

- 1902. 19020310. Giorgio Roster. Firenze. 3 p. richiesta piante di Agave, Opuntia, Cereus, ecc.
- 1904. 19040117. I. Baldrati, Colonia Eritrea, Ufficio Agrario Sperimentale, Asmara. 1 p. Euforbie….
- 1904. 19040314. N.S. Pillans Rosedale, Rosebank, Cape Colon. [RSA]. 4 p. Stapelia, Duvalia, Huernia
- 1904. 19040321. A. Borzì, Regio Orto Botanico Palermo. 3 p... *Aloe che ho intenzione di chiamare A. hanburyi, in piena e splendida fioritura...*
- 1904. 19040324. Morris. R.M.S. Orotava. 4 p. A collection of plants form the Canarian and Madeira.
- 1904. 19040531. Curt Schrottky [entomologist]. Villa Encarnacion, Alta Paranà, Paraguay. 1 p. Rhipsalis
- 1904. 19040716. J. Meddley Wood. Natal Botanic Gardens. [RSA]. 1 p. *Aloe natalensis*….
- 1904. 19041014. Friedrich Fobe. Ohorn. 2 p. Cereus sonomensis, cereus stellatus, prof. Schumann.
- 1904. 19040812. Curt Schrottky, Villa Encarnacion, Alta Paranà, Paraguay. 4 p. Opuntia, Rhipsalis, pollinators.
- 1905. 19050422. M.T. Dawe. Scientific and Forestry Department Entebbe Botanic Garden, Uganda. 1p. small plant of our native aloes.

- 1906.19061205. Mac Owen. Botanic Garden Cape Town [RSA]. 3p. Cycas and Tree Ferns
- 1907. 19070904. Sargent. Arnold Arboretum Harvard University. Seeds collected by Wilson (China).
- 1907. 19071011 Daniel Fairchild. United States Departement of Agricolture Bureau of Plant Industry, Washington. Seeds from Mexico of *Cereus eburneus* and new specie of Pilocereus….

DEVELOPMENT OF BOTANICAL COLLECTIONS: *HORTUS MORTOLENSIS* AND CONTRIBUTIONS ON HORTICULTURE MAGAZINES.

A measure of the development of botanical collections that the garden had with Berger results clear comparing the number of species listed in the 1912 catalogue with the previous one: 5800 species compared to about 3600 contained in the catalogue drawn up by Dinter published in 1897. As for Aloes, the collection included 98 species, along with several varieties and hybrids, a number three times greater than the previous edition; overall, succulent collections increased in the same order of range. Other collections had a substantial boot in the 15 years between the two catalogues, such as *Citrus*, with 58 varieties in 1912, against 26 in 1898 (Mariotti & Zappa, 2015); the flora of the Canary Islands, that in 1912 was represented by 130 taxa, number more than doubled compared to the previous edition (Zappa & Campodonico, 2006). *Hortus Mortolensis* distinguished from previous editions as well as for species richness, and the accuracy of the nomenclature and systematic, for the presence of notes on the introduction, the systematic and the origin of specimen of individual species, genera and/or collections.

In those years, they conducted observations on the fertilization of the new plants introduced to la Mortola. Experiments of fertilisation of specific group, such as *Yucca*, were made, introducing the pollinator by the origin area; in the 1890s Thomas Hanbury introduced from America the moth *Pronuba yuccasella*, which is the only insect able to fertilise yuccas: the moth is very small and very less visible for his short life and

nocturnal activity. Thomas Hanbury wrote a note on experience on *Gardener's Chronicle* (1902) and A. Berger reported it in the note about *Yucca* in *Hortus Mortolensis*.

Observations on biology and horticultural behaviour of exotic plants growing at la Mortola were object of several contributes published on the "Gardeners' Chronicle": *Cantua pendens* (1898), *Aloe schweinfurthii* (1898), *Rosa gigantea* (1898), *Citrus medica* var. *digitata* (*Citrus medica* 'Buddha's Finger') (1902), *Calodendron capense* (1903a), Opuntias (1903b), *Phyllocactus strictus* (1903c), *Caralluma crenulata* (1904a), *Opuntias* (1904b), *Aloe baumii* (1904c), *Huernia oculata* (1904d), *Echinocereus acifer* Lemaire (1904e), the genus *Aloe* (1904f), *Stapelia divergens* (1905a), the genus Agave (1905b), Crassula columnaris (1905c), *Castanospermum australe* (1905d), *Buddleia asiatica* (1906a), *Acacia podalyriaefolia* (1906b), *Aberia caffra* (1906c), *Beschorneria pubescens* (1906d), *Hibiscus venustus* (1908a), shrubby and soft-wooded *Compositae* (1908b), *Erythrina insignis* (1908c), *Brassica insularis* (1908d), culture of epiphytes (1909a),succulents (1909b), plants from China obtained from Mr. Wilson (1909c), *Schotia brachypetala* (1909d), *Melianthus intermedius* (1911a), *Senecio prainianus* (1911b), *Montanoa wercklei* (1911c).

## BOTANICAL INVESTIGATION ON WILD FLOWERS: 1905 "FLORULA MORTOLENSIS ".

In 1905 Alwin Berger, published "Florula Mortolensis, an enumeration of the plants growing wild at La Mortola", a list of plants that spontaneously grew at la Mortola, that he elaborate in the summer 1903. The list (486 species gathered in 92 families), compiled in systematic order for family, contains information on the ecology and location of taxa. The copy of Hanbury Botanic Gardens contained some notes with the local dialect names. The list includes 486 species grouped in 92 families, drawn up in taxonomic order by family.

In 1905 Clarence Bicknell reviewed *Florula Mortolensis* on the "Gardeners Chronicle": " *This is a catalogue of plants growing wild in the neighbourhood of La Mortola, and has been prepared by Mr. Alwin Berger. It has been drawn up by order of Sir Thomas Hanbury for the benefit of the numerous visitors who come to see his gardens, many of whom are often not less interested in the indigenous than in the luxuriant tropical and subtropical plants under cultivation. The vegetation of this portion of the Italian Riviera in the immediate neighbourhood of Mentone is both rich and varied, as this useful catalogue abundantly testifies. Its luxuriance is due to the great variety of locality that exists. There are dry, steep rocks, deep and fertile soil, bare sunny banks, shady and woody places, water-channels, the bed of a torrent, and the sea shore. The sub-soil is almost entirely limestone, in many places rich in fossils. Sand occurs only in one isolated spot close to the garden entrance, but it contains chalk as well, and does not influence in any way the wild vegetation. We should add that Mr. Berger calls attention to the following volume as containing good illustrations of the Riviera plants – Contributions to the Flora of Mentone, and to a Winter Flora of the Riviera, etc., by J. Traherne Moggridge (1871), and Flowering Plants and Ferns of the Riviera »* .

## BOOKS, SCIENTIFIC PAPERS AND BOTANICAL PHOTOGRAPHS

Berger published a great number of books, monographies, and scientific papers on the major groups of succulents, on which focuses Metzing's contribute (Metzing, 2017).

Most of the photographs and the drawing of these texts concern plants cultivated at la Mortola: the richness of the collections afforded him with a wealth of material to study, and photography was a tool for his scientific research.

The historical photographical found of Hanbury Archive cares an important collection of botanical images having as subjects mainly agave and aloes, as well as Cacti and other succulents, that has been analysed

by Viale (2011). This nucleus is composed by nearly 300 photographs realized with different photographical technical, and is a testimony of primary interest in documenting Berger's studies.

On the original paper envelopes, as well as on some positive, captions handwritten by Berger, let us to ascribe to him this photographic material, documenting his interest for the photographic medium, as an element of study and classification. Most of the photographs are plants of La Mortola garden, but there are also some pictures of botanical interest, referring to different contexts.

Photography is used for the preparation of botanical images aimed to printing. In the shots, the botanical subject is isolated from the garden context. In some pictures, it is the case with some photos of succulent plants in bloom, the best definition is obtained thanks to the help of a wooden panel or a black cloth used as a background; sometimes a human figure or an auction is inserted inside the frame to provide a reference measurement unit (Viale, 2011).

Photography was also a support for the drawings, in order to obtain a more faithful graphic return to the botanical image. In the case of his aloe monography (1908e), a comparison of photographs and drawings made by Berger by hand (IISL-FH and GBH-FH), allows us to follow the process from the plate to the drawing. Examples are represented by *Aloe somaliensis* (GBH-FH, inv. 240, 986); *Aloe supralaevis,* photographed by the Author (IISL-FH, inv. 155) and the drawing of fig. 129 p. 308; *Aloe speciosa* (GBH-FH, inv. 984) and fig. 124 of Aloe's monography (Berger, 1908). Plate 1, 2.

In the Agave monography (1915), the Author had included a number of photographic plates, with images at la Mortola in the garden and on the cliff, and in Ludwig Winter's Garden at Madonna della Ruota, Bordighera; some examples are represented by *A. cochlearis*, Madonna della Ruota, Winter, July 1911. (IISL-FH, inv. 105) and fig. 41 (Berger, 1915.); *A. mitis* (sub *A. rupicola* IISL-FH inv. 28) and fig. 9 (Berger,

1915), plate 3; *A. americana* (IISL-FH, inv. 102) and fig. 47, p. 152 die Agaven (Berger, 1915), plate 4.

Also *Mesembrianthemum* taxa cited in the monography (1908f) were cultivated at la Mortola, an example is *Mesembrianthemum wettsteinii*, October 1908, IISL-FH, inv. 147.

In Systematic revision of the genus *Cereus* Mill. (1905e), the original photographs of plates 5 and 12 are conserved in IISL-FH inv. 0988, 0975; likewise the original drawings (GBH-FH, busta 14, reg. 133/136).

Also for *Stapelieen und Kleinien* (1910), some photographs and drawings were obtained by plants growing at la Mortola or in surrounding gardens. Some original documents are represented in plate 4.

Another consistent group of photographs of Hanbury Archives referred to groups of plants, visual views and documented the species, the displays of collections, the outline of the garden in his different landscaping and environmental aspects of the early '900, and documented the intense and profitable work of Berger curator.

## CONCLUSIONS

Alwin Berger made a fundamental contribution to the development of the garden. A first analysis of archive documents allowed us to widen on the botanical networks, to date the introduction of several taxa, and to identify the origin of some cultivated specimens. The complete analysis of these documents is ongoing and it will contribute to the traceability of the current living collections.

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## APPENDIX I. LA MORTOLA IN THE EARLY' 1900 IN A. BERGER'S PHOTOGRAPHS AND DRAWINGS (HANBURY ARCHIVES).

Plate 1. Aloe studies
Plate 2. Aloe studies
Plate 3. Agave studies.
Plate 4. Stapelien drawings and *Caralluma*
Plate 5. Aloe collection in A. Berger's photographs.
Plate 6. Agave collection in A. Berger's photographs.
Plate 7. The South Terrace with the succulents beds in front of the Museum.
Plate 8**.** Photographs made in the surrounding gardens. Villa St. Luigi at the frontier, Villa Paradu, the Casino in Monte Carlo. This photograph was published in the gen. *Cereus*. A. Berger is inside the frame as a reference unit of measurement.
Plate 9. Views of the Garden in the early'1900.
Plate 10. Views of the Garden in the early'1900.
Plate 11. Views of the Garden in the early'1900. Agave slope in the "Quattro Stagioni" area and the "Gran Route".
Plate 12. Views of the Garden in the early'1900

PLATE 1

A. Berger. *Aloe somaliensis*. IISL-FH inv. 986

A. Berger. *Aloe somaliensis.* IISL-FH inv. 240

*A. somaliensis*–fig. 86 in Berger (1906e)

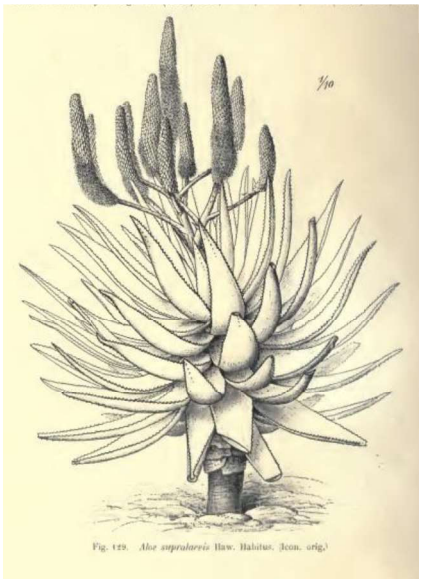
A. Berger. *A. tricolor & saponaria.* IISL-FH inv. 196

A. Berger. *A. campylosiphon*. IISL-FH inv. 204

A. Berger.. *A. mitriformis.* IISL-FH inv. 154

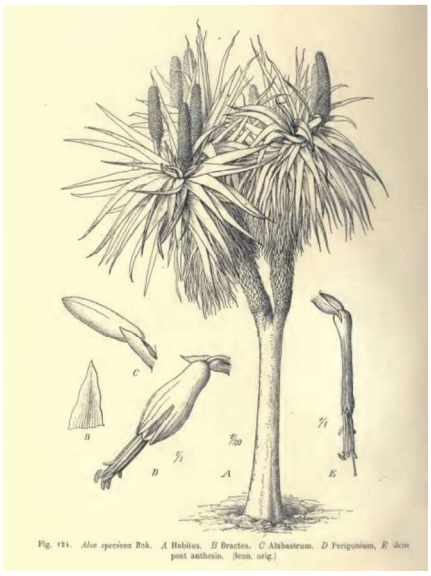
PLATE 2

A. Berger. *Aloe supralaevis*. IISL-FH inv. 155



*Aloe supralaevis* in Berger (1908e)

Berger. *Aloe speciosa*. IISL-FH inv. 984



*Aloe speciosa* in Berger (1908e)

PLATE 3

A.Berger. *A. cochlearis*, Madonna della Ruota, Winter, July 1911. IISL-FH inv. 105

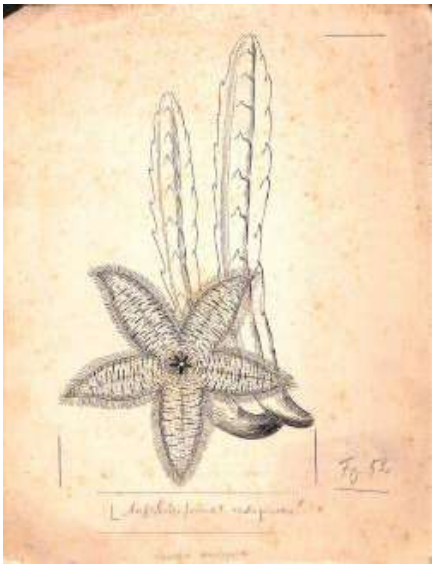
*A. cochlearis*, fig. 41 in Berger (1915)

*A. mitis* (sub *A. rupicola*). IISL-FH inv. 28

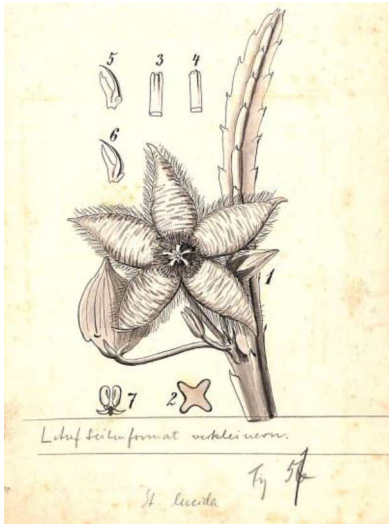
*A. mitis*, fig. 9 in Berger (1915)

PLATE 4

A.Berger fig. 21 Stapelien - original drawing. GBH-FH



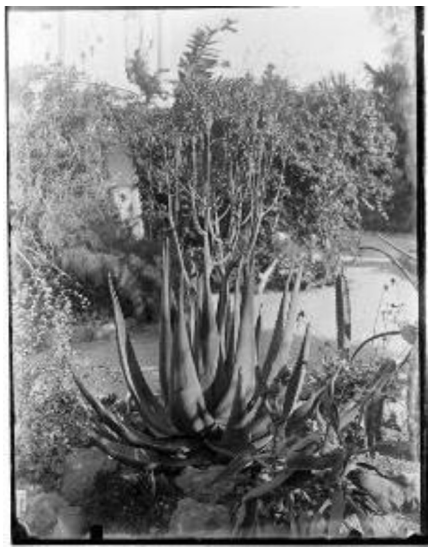
A.Berger fig. 52 Stapelien - original drawing. GBH-FH



A.Berger fig. 56 Stapelien – S. asterias var. lucida. Original drawing. GBH-FH

A.Berger. *Caralluma*. IISL-FH inv. 978.

PLATE 5



A. Berger. *A. schweinfurthii.* IISL-FH inv. 151

A. Berger. *A. campylosiphon.* IISL-FH inv. 189

A. Berger. *A. pallidiflora.* IISL-FH inv. 189

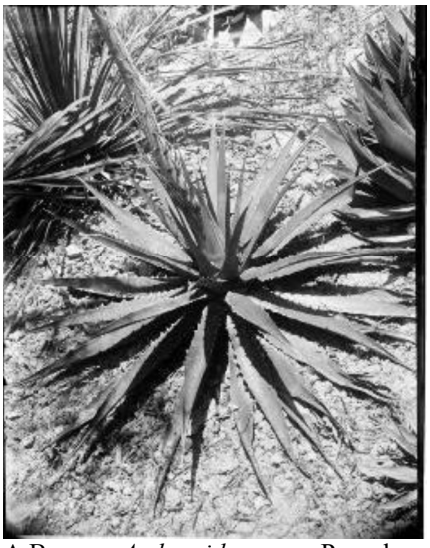
A. Berger. *A. hereroensis.* IISL-FH inv. 148

PLATE 6

A.Berger. *A. schidigera*. IISL-FH inv. 105

A.Berger. *A. ghiesbreghtii*. IISL-FH inv. 70

A.Berger. *A. heteracantha* Rondo Nuovo ende Nov. 1910. IISL-FH inv. 86



A.Berger. *A. horrida* sopra Pergola July 1909. IISL-FH inv. 116

PLATE 7

A.Berger. *Alte cacteengruppe* [sic] *...museum.* IISL-FH inv. 233

A.Berger. *Alte cacteengruppe* [sic]*..museum* IISL-FH inv. 235

A.Berger. IISL-FH inv. 205

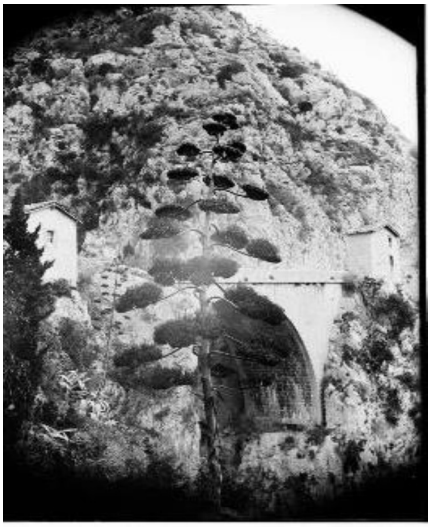
A.Berger. IISL-FH inv. 8

PLATE 8

A.Berger. *Piptanthocereus validus* Casino garden – Montecarlo. IISL-FH inv. 0988. Published also in Berger (1905).

A.Berger. *Cereus* in Villa Paradu *C. gilliesi c. pasacana* - June 1909 IISL-FH inv. 123

A.Berger. *Agave salmiana* villa St Luis July 1911. IISL-FH inv. 115



A.Berger. *Agave salmiana* villa St Luis July 1911. IISL-FH inv. 172

PLATE 9

*A.Berger*. *Agave crenata*. IISL-FH inv. 163

A.Berger. *Agave picta* July 1911. IISL-FH inv. 125

A.Berger. *Agave Hanburyi sopra la Pergola ende Nov. 1910*. IISL-FH inv. 90

A.Berger. IISL-FH inv. 197

A.Berger. *Agave friederici* cadenza delle Cycas IISL-FH inv. 180

A.Berger. Succulente sotto la Pergola. IISL-FH inv. 755

PLATE 10

A.Berger. *Aloe arborescens* IISL-FH inv. 266

A.Berger. *Aloe arborescens natalensis.* IISL-FH inv. 265

A.Berger. *Furcraea bedinghausii* May 1909. IISL-FH inv.52

A.Berger. *Agave.* IISL-FH inv. 106 *Agave*

PLATE 11

IISL-FH inv. 717

A.Berger. *Agave vivipara L.M.* IISL-FH inv. 168

GBH-FH inv. 718

GBH-FH inv. 719

PLATE 12

A.Berger. *A. scolymus* Quattro Stagioni May 1909. IISL-FH inv. 0136

A.Berger. *Agave salmiana* May 1909. IISL-FH inv. 0133

A.Berger. *Agave haynaldii* in ... Route Nuova ende Nov. 1910. IISL-FH inv. 110

A.Berger. *Agave atrovirens fol.var. neben Ag. Salmiana*. Quattro Stagioni Nov. 1910. IISL-FH inv. 68