

EARLY CULTIVATION OF MACARONESIAN PLANTS IN THREE EUROPEAN BOTANIC GARDENS

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ABSTRACT

The Chelsea Physic Garden (London) (established in 1673), the Botanic Garden of Amsterdam (established in 1682), and the Clifford's Hartekamp Gardens (the Netherlands, established in 1709 by George Clifford II) were among the most important pre-Linnaean botanic gardens in Europe and were famous because of their living collections of exotic plants. There is relatively extensive documentation of what plant material was grown in these botanic gardens prior to Linnaeus establishing the now generally accepted binomial system for naming plants. A study of these documents pertinent to species originally from the Macaronesian Islands is presented as a contribution to the history of European plant collections and the introduction of new exotics to European horticulture. A total of 29 taxa from the region were cultivated in at least one of these gardens between 1689 and 1751. Two of them are non-native species from the New World including one weed and the common chili pepper. Three native Macaronesian species also occur on the mainland. The rest of the taxa are endemics in at least one of the Macaronesian islands. It is likely that most of this material was introduced into European gardens by merchants and occasional travelers who visited the islands rather than professional plant collectors or botanists. Our study highlights the role of these early botanic gardens in the introduction of plants in Europe.

Key words: History of botany, Canary Islands, Madeira, Azores, Cape Verde, plant exploration.

RESUMEN

El "Chelsea Physic Garden" de Londres (fundado en 1673), el Jardín Botánico de Ámsterdam (fundado en 1682), y el Jardín de Clifford de Hartekamp (localizado en Holanda y fundado en 1709 por George Clifford II) se encuentran entre los principales jardines pre-linneanos de Europa. Los mismos fueron famosos por sus colecciones de plantas foráneas. Para

estos jardines existe relativamente amplia documentación sobre el material que se cultiva en los mismos con anterioridad al establecimiento del sistema de clasificación binomial de Linneo. Se presenta un estudio de esta documentación referente a especies de las islas macaronésicas. Estas colecciones nos ayudan a entender la historia de las colecciones de los jardines europeos y de la introducción de especies alóctonas en el desarrollo de la horticultura del continente. Un total de 29 taxa de esta región se cultivaron en al menos uno de estos jardines botánicos entre 1689 y 1751. Dos de estas especies son del Nuevo Mundo, incluyendo una mala hierba y el pimiento común. Tres de estas especies son nativas en la Macaronesia, pero también se encuentran en el continente. El resto de las especies son endemismos de al menos una de las islas macaronésicas. Es probable que la mayor parte de este material se introduce en estos jardines por comerciantes y visitantes que de forma ocasional visitan las islas y no por colectores de plantas o botánicos profesionales. El estudio destaca el papel jugado por los jardines botánicos más antiguos en las introducciones tempranas de plantas en la sociedad europea.

Palabras claves: Historia de la botánica, Canarias, Madeira, Azores, Cabo Verde, exploración vegetal.

“Cada uno avanzaba embargado en aquella soledad sin márgenes, en aquel silencio verde y blanco, los árboles, las grandes enredaderas, el humus depositado por centenares de años, los troncos semi-derribados que de pronto eran una barrera más en nuestra marcha. Todo era a la vez una naturaleza deslumbradora y secreta y a la vez una creciente amenaza de frío, nieve, persecución. Todo se mezclaba: la soledad, el peligro, el silencio y la urgencia de mi misión.”

Pablo Neruda, *Hacia la Ciudad Espléndida*, 1971.

“Each of us made his way forward filled with this limitless solitude, with the green and white silence of trees and huge trailing plants and layers of soil laid down over centuries, among half-fallen tree trunks which suddenly appeared as fresh obstacles to bar our progress. We were in a dazzling and secret world of nature which at the same time was a growing menace of cold, snow and persecution. Everything became one: the solitude, the danger, the silence, and the urgency of my mission.”

Pablo Neruda, *Towards the Splendid City*, 1971.

1. INTRODUCTION

The publication of *Species Plantarum* by Carolus Linnaeus (1707-1778) in 1753 (LINNAEUS [42]) represented a major turning point in the history of plant systematics. This work provided a widely accepted system to classify organisms based on binomial nomenclature. Prior to 1753 botanical studies were important in Europe, mostly because of the increasing relevance of science and plant exploration during the “Age of Enlightenment” (GROVE [29]). By the middle of the 18th century there were several botanic gardens in Italy, France, Germany, the Netherlands, Spain, and the United Kingdom (PLUCKNETT *et al.* [61]; PUERTO SARMIENTO [63]). Some of these botanic gardens were affiliated to governmental or academic organizations but others were owned by wealthy individuals with a primary interest in

growing exotic plants. Indeed, between 1735 and 1737 Carolus Linnaeus himself worked as the botanical curator of the private gardens of George Clifford III (1685-1780) located at Hartekamp, in Heemstede (the Netherlands) (JARVIS [40]; Figure 1). The gardens were formally established in 1709 when the state was purchased by George Clifford II (WIJNANDS & HENIGER [93]).

Linnaeus took up this appointment by Clifford shortly after obtaining his Degree in Medicine from the University of Hardewijk (also in the Netherlands). Clifford was a Director of the Dutch East Indian Company (JARVIS [40]) and therefore had access to many plants and animals from South Africa, Asia and elsewhere thanks to the powerful Dutch trade routes

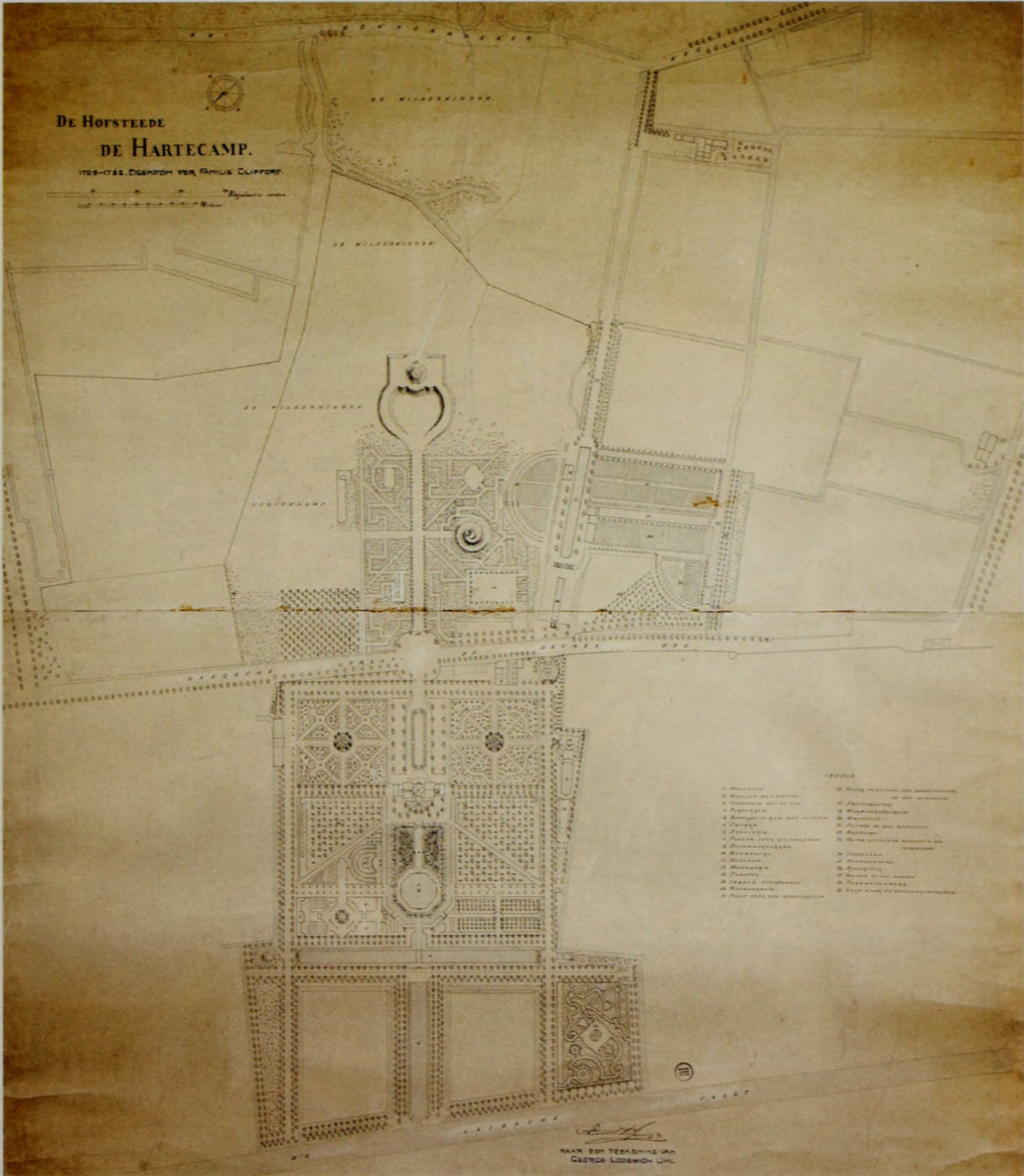


Figure 1. Map of Clifford’s Hartekamp Gardens as it appears between 1735 and 1760. This is a copy made by L.A. Springer from the original map that was made by George Lodewich Uhl (WIJNANDS & HENIGER [93]). The original map is in poor conditions and it is located at the Archives of the Province of Noord-Holland (<http://www.beeldbank.noord-hollandsarchief.nl/beeldbank>). By courtesy of the library of Wageningen University.



Figure 2.- Copperplate engraving of Linnaeus as the frontispiece of *Hortus Cliffortianus* (LINNAEUS [41]). The illustration shows Linnaeus as the young Apollo (bearing a flamed torch on his left hand), bringing knowledge against ignorance (see CALLMER & GERTZ [7] for an interpretation of this illustration). By courtesy of the library of Fairchild Tropical Botanic Garden.



CAMPANULA foliis hastatis dentatis, caule determinate folioso. *Hort. Cliff.* 65. p. 10.
Ramulus cum Flore. Folia opposita sunt.

G. D. EHRET del.

J. WANDELAAR fecit.

Figure 3.- Copperplate engraving of *Canarina* [as *Campanula*] *canariensis* made by Georg Dionysius Ehret and engraved by Jan Wandelaar. Depicted in *Hortus Cliffortianus* (LINNAEUS [41]). By courtesy of the library of Fairchild Tropical Botanic Garden.

in the tropics. These gardens were part of the state symbolism, a statement of increasing international power, and a focal point for the developing sciences of natural history and taxonomy (SCHAMA [75]; SCOTT & HEWETT [77]). Many of the species first given binomial names by Linnaeus in *Species Plantarum* (including 21 Macaronesian plants) were based on the living collections that he studied while at the Hartekamp. As a result of his near three-year tenure (1735-1737) in this botanic garden, LINNAEUS [41] produced a remarkable 502 page catalogue with descriptions and engravings of its living collections which has been considered as one his masterpieces (Figure 2) (STEARN [82]). This work featured a plate of the Canarian Island endemic *Canarina* [as *Campanula*] *canariensis* made by Georg Dionysius Ehret (1707-1770) and engraved by Jan Wandelaar (1690-1759) (Figure 3).

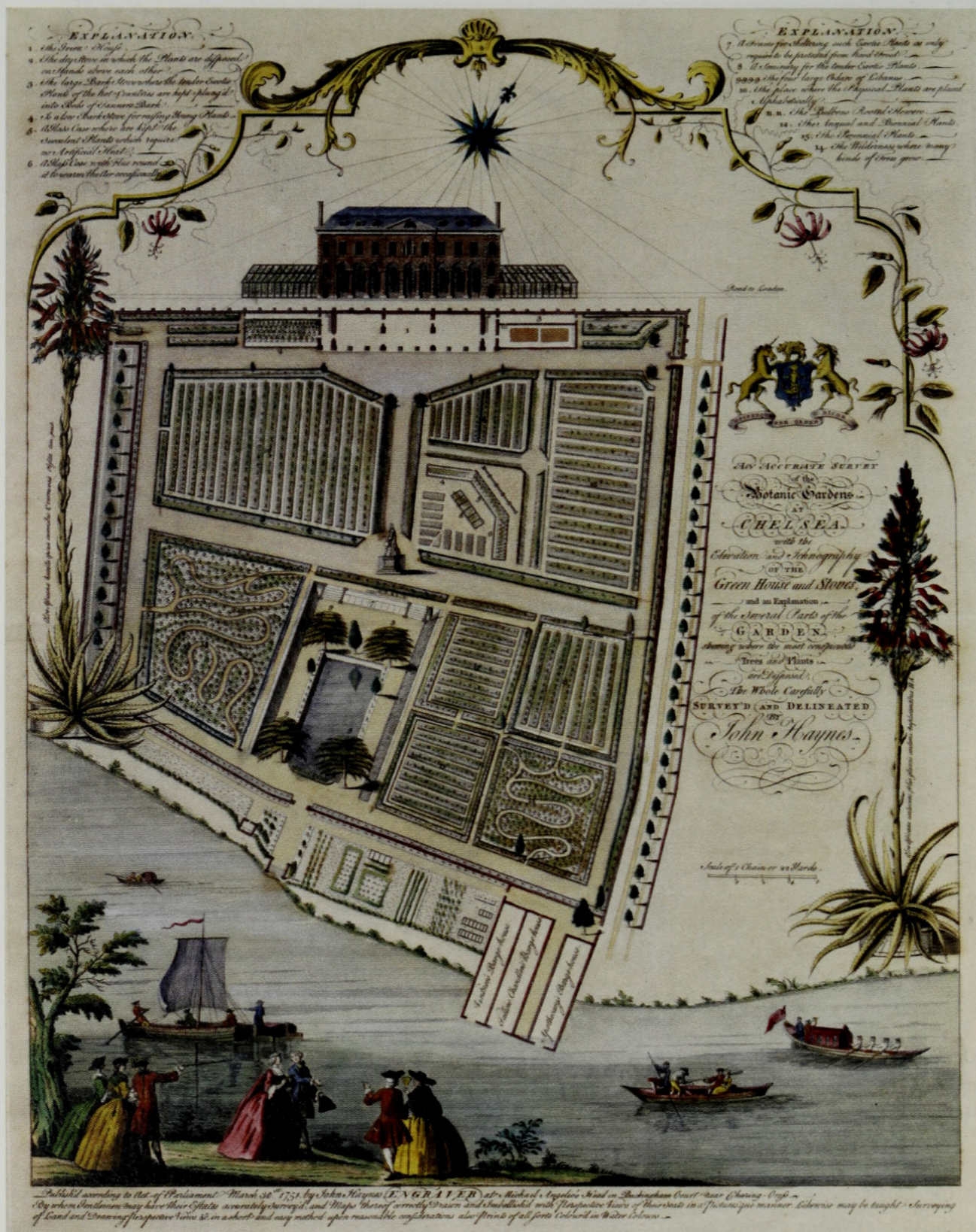


Figure 4.- Map of the Chelsea Physic Garden made by John Haynes (ca. 1706-ca. 1770) in 1751. Notice the statue of Sir Hans Sloane located in the center of the garden (see Figure 5). By courtesy of the Royal Society.

In previous studies we have shown that, besides Clifford's Hartekamp Gardens, several other European gardens grew plants from the Macaronesian Islands before 1753 (SANTOS-GUERRA [72]; FRANCISCO-ORTEGA *et al.* [27-28]). Among them there were the Chelsea Physic Garden (located in London) and the Botanic Garden of Amsterdam (also cur-



Figure 5.- Statue of Sir Hans Sloane located on the central courtyard of Chelsea Physic Garden. This is replicate of the original statue as it was made by John Michael Rysbrack (1694-1770) in 1737 and placed on this site. The original statue has been located at the British Museum since 1983 (MINTER [45]). Photo credit: Charlie Hopkinson.

rently known as the *Hortus Botanicus* Amsterdam, but known in the 18th century as *Hortus Medicus Amstelodamensis*).

The Chelsea Physic Garden was founded in 1673 by the Worshipful Society of Apothecaries of London as the “Aphotecaries’ Garden” on the banks of the River Thames (MINTER [45]) (Figure 4). It is the second oldest botanic garden of Britain, and it was established only 40 years after the foundation of the University of Oxford Botanic Garden (year 1621, HILL [36]). However, it was not until 1712 that the Chelsea Physic Garden was consolidated as an institution thanks to a generous gift by Sir Hans Sloane (1660-1753) that allowed for the purchase of the land where the garden is still located (Figure 5) (MINTER [45]). As part of the arrangements made by Sloane to buy this property, every year the Chelsea Physic Garden was required to send 50 herbarium specimens of different species prepared from its living collections to the Royal Society. In accordance with Sloane’s stipulation, 1,600 herbarium specimens



Figure 6.- Specimen of *Jasminum azoricum* (Madeiran endemic) from the living collections of Chelsea Physic Garden that was sent from this botanic garden to the Royal Society in 1733 (RAND [65]). By courtesy of the Natural History Museum of London.

were received by the Royal Society between 1722 and 1753 (STUNGO [83]). These specimens now form part of the herbarium of the Natural History Museum in London (BM) (Figure 6). The “*Philosophical Transactions*” of the Royal Society regularly published articles listing the specimens that were received annually from Chelsea Physic Garden. In eight of these articles (MILLER [46-47]; RAND [65-67]; SLOANE & RAND [79]; WILMER [95-96]) Macaronesian specimens are listed.

Early records for material cultivated in this garden are found in a manuscript located in the Sloane's Collection of the British Library (reference: MS 3370 ff. 14-19). This document was signed by James Petiver (see below), Simons Andrews, Thomas Wycks, and an unknown fourth author with an illegible signature. This manuscript has a list of plants that were grown in Chelsea Physic Garden by November 1706. Additional records for the early 18th century were provided in seven accounts published by the famous naturalist James Petiver (ca. 1658-1718) (PETIVER [54-60]).



Figure 7.- Portrait of Isaac Rand, attributed to John Ellys (1701-1757) (for further details see HUNTING [36]). By courtesy of the Worshipful Society of Apothecaries of London.

In addition, between 1730 and 1739 three catalogues listing the material grown in this botanic garden were published by MILLER [48] and RAND [64, 68]. Most of the references for Macaronesian plants cultivated at this botanic garden were provided by Isaac Rand (1674-1743) (Figure 7) who was the first official Director of the Chelsea Physic Garden (HUNTING [37]).

The *Hortus Medicus Amstelodamensis* was founded in its present location in 1682 (in the Plantage District) (Figure 8). However, several “medical gardens” existed in Amsterdam from 1638 at different sites (WIJNANDS [91-92]; WIJNANDS *et al.* [94]). This is the fourth oldest botanic garden

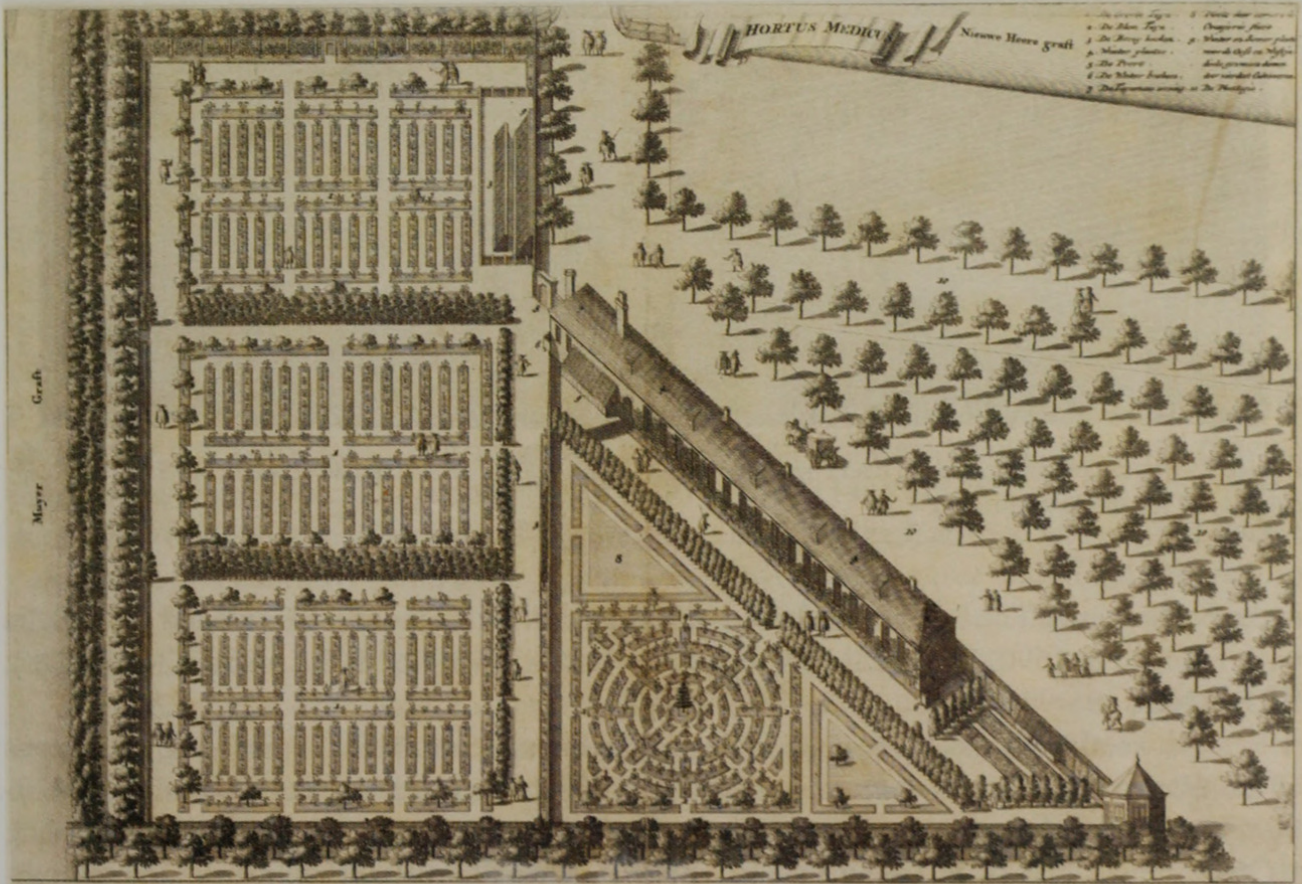


Figure 8.- Map of the Amsterdam Botanic Garden by 1685 as published by C. COMMELIN [9]. By courtesy of the University of Amsterdam Library Special Collections.



Figure 9.- Portrait of Jan Commelin made by Gerard Hoet (1648-1733). Unknown date between 1675 and 1700. By courtesy of Amsterdam Museum.

in the Netherlands. The botanic gardens of the universities of Leiden, Utrecht, and Groningen were founded in 1590, 1639, and 1642 respectively (VEENDORP & BAAS BECKING [88]; WIJNANDS [91-92]).

Between 1646 and 1724, nine catalogues listing material found in the living collections of the *Hortus Medicus Amstelodamensis* were published, mostly by Jan Commelin (1629-1692) and his nephew Caspar Commelin (?-1731) (Figures 9-10) (C. COMMELIN [10-11]; J. COMMELIN [14-18]; CORNELII [19]; SNIPPENDAEL [80]). The three catalogues published in 1697, 1701, and 1706 depicted plants cultivated in this garden (C. COMMELIN [11]; J. COMMELIN [15-16]) and the two catalogues published in 1703 and 1706 were re-



Figure 10.- Painting made by Cornelis Troost (1697-1750) in 1724 portraying the “Inspector of Collegium Medicum”. Caspar Commelin (the second from right) is shown with his right hand on a copy of the third edition of his catalogue of plants grown at *Hortus Medicus Amstelodamensis*. By courtesy of Amsterdam Museum.

issued in 1715 (C. COMMELIN [12, 13]). In addition, 420 watercolors of plants growing in this garden were produced during this time (WIJNANDS [91]). They form what is known as the *Moninckx Atlas* (located at University of Amsterdam Library Special Collections), in reference to Jan Moninckx (?-1714) and Maria Moninckx (?-1757), who were the main artists producing these paintings (WIJNANDS [91]). These watercolors are available online at the website of the University of Amsterdam Library (http://www.uba.uva.nl/digital_production_centre/home.cfm). In a previous study (FRANCISCO-ORTEGA *et al.* [28]), we reproduced two of the watercolors from the *Moninckx Atlas* (for the Canarian endemics *Aeonium canariense* and *Isoplexis canariensis*). In this study we present three additional watercolors of Canary Island endemics (*Convolvulus canariensis*, *Justicia hyssopifolia*, and *Teline canariensis*; Figures 11-13) from this “botanical atlas.”

In this paper our research concerning early cultivation of Macaronesian plants in Europe focuses on these three botanic gardens because: (1) there are several archival documents and published works/catalogues with details of material found in their living collections, (2) there are herbarium specimens for many of the species that were cultivated in Chelsea Physic Garden and Clifford’s Hartekamp Gardens, and (3) several of the published catalogues of the Botanic Garden of Amsterdam and of the *Moninckx Atlas* have extraordinary illustrations of the species that were grown in this botanic garden.



Figure 11.- Watercolor of *Convolvulus canariensis* located at the Moninckx Atlas (vol. 3, t. 49) made Jan Moninckx. Unknown date between 1686 and 1700. By courtesy of the University of Amsterdam Library Special Collections.



Figure 12.- Watercolor of *Teline canariensis* located at the Moninckx Atlas (vol. 3, t. 50) made by Maria Moninckx. Unknown date between 1686 and 1699. By courtesy of the University of Amsterdam Library Special Collections.



Figure 13.- Watercolor of *Justicia hyssopifolia* located at the Moninckx Atlas (vol. 8, t. 38) made Maria Moninckx. Unknown date between 1686 and 1706. By courtesy of the University of Amsterdam Library Special Collections.

2. RECORDS OF LIVING COLLECTIONS OF MACARONESIAN PLANTS

In this section Macaronesian species grown in at least one of the three gardens are listed alphabetically (taxonomy and nomenclature follow ACEBES GINOVÉS *et al.* [1], JARDIM & MENEZES DE SEQUEIRA [39], SÁNCHEZ-PINTO *et al.* [71], SILVA *et al.* [78], THE ANGIOSPERM PHYLOGENY GROUP [84], and UPSON & ANDREWS [86]).

The taxonomic identity is followed by details of the distribution and status of the taxon in question [AZO, endemic to Azores; CAN, endemic to the Canary Islands; CAP, endemic to Cape Verde; CUL, cultivated; INT, human-introduced to the Macaronesian islands (archipelagos are listed inside parenthesis); MAC, endemic to Macaronesia (archipelagos are listed inside parenthesis); MAD, endemic to Madeira; NAT, native to Macaronesia (archipelagos are listed inside parenthesis)]. For each taxon and botanic garden (coded as “AMSTERDAM” for the Botanic Garden of Amsterdam, “CHELSEA” for the Chelsea Physic Garden, and “CLIFFORD” for the Clifford’s Hartekamp Gardens) we provide at least the first three words of the polynomial description as it is stated in the appropriated work. We also provide the page numbers of the works where the polynomial and/or the illustrations are located. For those specimens sent from the Chelsea Physic Garden to the Royal Society we provide their voucher number as recorded at BM. The “NOTES” entry gives additional information particularly pertinent to cultivation of these species in other gardens as referred in the relevant catalogues of these botanic gardens and other works (i.e., AITON [2-4]; HALLIWELL [31]; HARVEY [32]; LINNAEUS [41-44], MILLER [51]; PLUKENET [62]). We were unable to locate herbarium specimens or illustrations referring to these additional records for other gardens (except for those provided by PLUKENET [62]); therefore further research is needed to validate this information.

Taxonomic identifications for the material cultivated in the three botanic gardens were based on available herbarium specimens and illustrations. When these sources were not available our identifications relied on the polynomial descriptions. Several of these polynomials descriptions refer to illustrations of Macaronesian plants made by Leonard Plukenet (1642-1706), who was superintendent of the Royal Gardens of Hampton Court (England). Taxonomic identifications for Macaronesian taxa found in the works of this pre-Linnaean botanist were reviewed by FRANCISCO-ORTEGA *et al.* [25]

It is noteworthy that among the plants cultivated at Clifford’s Hartekamp Gardens (LINNAEUS [41]) several of them were reported as occurring both in the Macaronesian archipelagos and other regions [e.g., *Cassia fistula* L. (Fabaceae), *Foeniculum vulgare* L. (Apiaceae), *Saccharum officinarum* L. (Poaceae)]; however, we are not certain if the material grown at this garden came from Macaronesia or not. We have therefore excluded these plants from our list, and we have included only those taxa that LINNAEUS [41] reported as exclusively from the Macaronesian archipelagos or those that are endemic to these islands.

Aeonium canariense (L.) Webb & Berth. (Crassulaceae), CAN

AMSTERDAM: *Sedum canarinum foliis* [...] (J. COMMELIN [16]: 189, t. 95; Moninckx Atlas 4, t. 45, 46 [unknown artist (1686-1700)]).- CHELSEA: 15. *Sedum Canarinum: foliis* [...] (RAND [68]: 182).- CLIFFORD: 2. *Sempervivum caule infra* [...] (LINNAEUS [41]: 179).- NOTES: LINNAEUS [43] (based on VAN ROYEN [87]) reported this species for the Botanic Garden of Leiden by 1740. AITON [3] (based on manuscripts located in the Sloane’s collection of the British Library [reference: MS 525 and MS 3349]) reported the species for the gardens of the Duchess of Beaufort by 1699.

***Aizoon canariense* L. (Aizoaceae), NAT**

CHELSEA: 2. *Ficoidea Canariensis, procumbens* [...] (RAND [68]: 77).- **CLIFFORD:** 1. *Aizoon foliis obverse* [...] (LINNAEUS [41]: 215).- **NOTES:** LINNAEUS [41] believed that the accession cultivated at the Clifford's Hartekamp Gardens came from the Canary Islands. LINNAEUS [41-42] (based on DILLENIIUS [22], VOLCKAMERUS [89], and VAN ROYEN [87]) reported this species for the Botanic Garden of Leiden by 1740 and for gardens of Nuremberg and Giessen (Germany) by 1700 and 1719. AITON [3] (based on MILLER [49]) reported the species being cultivated by Philip Miller (1691-1771) by 1731, it is likely that this material was part of the living collections of the Chelsea Physic Garden.

***Argyranthemum frutescens* (L.) Sch. Bip. subsp. *frutescens* (Asteraceae), CAN**

CHELSEA: 65 *Canary Dasie Pellitory* [...] (PETIVER [55]: 417); 788. *Pyrethrum frutescens Canariense* [...] (RAND [67]: 4, BM000810173); 32. *Aster Canariensis, frutescens* [...] (RAND [68]: 26).- **CLIFFORD:** 5. *Chrysanthemum fruticosum, foliis* [...] (LINNAEUS [41]: 417, BM000647217).- **NOTES:** LINNAEUS [41-42] (based on MORISON [52], WALTHERUS [90] and VAN ROYEN [87]) listed this taxon for the Oxford Botanic Garden by 1699, for the gardens of A. F. Waltherus in Leipzig by 1735 and at the Botanic Garden of Leiden by 1740. AITON [4] (also based on MORISON [52]) reported this species for the Oxford Botanic Garden by 1699.

***Bosea yervamora* L. (Amaranthaceae), CAN**

CHELSEA: 21. *Yerva-mora Hispanorum* [...] (RAND [68]: 214).- **CLIFFORD:** 1. *Bosia*. [/] *Tilia sorte* [...] (LINNAEUS [41]: 84).- **NOTES:** LINNAEUS [41] reported the material cultivated at the Clifford's Hartekamp Gardens from "*Americae insulis*" without referring to any particular island of the New World. LINNAEUS [41-42] (based on WALTHERUS [90] and VAN ROYEN [87]) listed this taxon for the gardens of A. F. Waltherus in Leipzig by 1735 and for the Botanic Garden of Leiden by 1740. AITON [2] (based on MILLER [51]) listed the species as cultivated "before 1728" by Philip Miller, it is likely that this material was part of the living collections of the Chelsea Physic Garden.

***Bystropogon canariensis* (L.) L. Hér. var. *canariensis* (Lamiaceae), CAN**

AMSTERDAM: *Heliotropium canariense arborescens* [...] (J. COMMELIN [16]: 129, t. 65; Moninckx Atlas 4, t. 13 [Jan Moninckx (1686-1699)]).- **CHELSEA:** 5. *Heliotropium Canariense arborescens* [...] (RAND [68]: 94).- **CLIFFORD:** 8. *Mentha floribus capitatis* [...] (LINNAEUS [41]: 307, BM000646014; BM000646015).- **NOTES:** J. COMMELIN [16] stated that this species was known in the Dutch gardens and that the plants cultivated in the Botanic Garden of Amsterdam were received (no date reported) from Gerbrand Pancras. LINNAEUS [41] (based on BOERHAAVE [6]) listed this species for the Botanic Garden of Leiden by 1720. AITON [3] (based on material located the Sloane's Herbarium at BM [reference: HS 142, f. 26]) reported this species for the gardens of the Duchess of Beaufort by 1714.

***Canarina canariensis* (L.) Vatke (Campanulaceae), CAN**

CHELSEA: 711. *Campanula Canariensis; Atriplicis* [...] (RAND [66]: 144, BM000810169); 16. *Campanula canariensis; Atriplicis* [...] (RAND [68]: 40).- **CLIFFORD:** 10. *Campanula foliis hastatis* [...] (LINNAEUS [41]: 65, t. 8).- **NOTES:** PLUKENET [62] appeared to base his description for this taxon on material grown the Royal Gardens of Hampton Court. LINNAEUS [42] (based on VAN ROYEN [87]) reported this taxon for the Botanic Garden of Leiden by 1740. AITON [2] (based on PLUKENET [62]) reported this species for the Royal Gardens of Hampton Court by 1696.

HARVEY [32] indicated that this species was cultivated in the nursery of Henry Wise by 1696.

***Capsicum annuum* L. (Solanaceae), CUL**

CLIFFORD: 6. *Solanum caule inermi* [...] (LINNAEUS [41]: 61, BM000558033).- NOTES: LINNAEUS [40] believed that the material grown at the Clifford's Hartekamp Gardens came from Madeira.

***Cedronella canariensis* (L.) Webb & Berth. (Lamiaceae), MAC (Azores, Canaries, Madeira)**

AMSTERDAM: *Cedronella canariensis viscosa* [...] (J. COMMELIN [16]: 81, t. 41; C. COMMELIN [10]: 8; Moninckx Atlas 3, t. 39 [Jan Moninckx (1686-1700)]).- CHELSEA: 66 Trifoliate Canary Mint [...] (PETIVER [55]: 418); 2. *Dracocephalon Canariense triphyllon* [...] (RAND [68]: 70); 1366 *Dracocephalon Canariense triphyllon* [...] (WILMER [95]: 404, BM000810167).- CLIFFORD: 5. *Dracocephalum floribus spicatis* [...] (LINNAEUS [41]: 308, BM000646035).- NOTES: J. COMMELIN [16] stated that this species had been in cultivation for some years at the Botanic Garden of Amsterdam. LINNAEUS [41-42] (based on BOERHAAVE [6], MORISON [52], and VOLCK-AMERUS [89]) reported this species for the Oxford Botanic Garden by 1699, for gardens of Nuremberg by 1700, and for the Botanic Garden of Leiden by 1720. AITON [3] (based on a manuscript located in the Sloane's collection of the British Library [reference: MS 3343]) reported this species for the gardens of the Duchess of Beaufort by 1697. HALLIWELL [31] suggested that this species was already in cultivation in England by 1578.

***Convolvulus canariensis* L. (Convolvulaceae), CAN**

AMSTERDAM: *Convolvulus canariensis sempervirens* [...] (J. COMMELIN [16]: 101, t. 51; Moninckx Atlas 3, t. 49 [Jan Moninckx (1686-1700)]).- CHELSEA: 67 Evergreen Canary Bindweed [...] (PETIVER [55]: 418); 363. *Convolvulus Canariensis; longioribus* [...] (SLOANE & RAND [79]: 2, BM000810168); 9. *Convolvulus Canariensis, sempervirens* [...] (RAND [68]: 57).- CLIFFORD: 4. *Convolvulus foliis cordatis* [...] (LINNAEUS [41]: 67).- NOTES: LINNAEUS [42] (based on VAN ROYEN [87]) listed this taxon for the Botanic Garden of Leiden by 1740. AITON [2] (based on material located the Sloane's Herbarium at BM [reference: HS 139, f. 63]) reported the species for the gardens of the Duchess of Beaufort by 1690.

***Dracaena draco* (L.) L. subsp. *draco* (Asparagaceae), MAC (Azores, Canaries, Cape Verde, and Madeira)**

AMSTERDAM: *Palma prunifera foliis* [...] (J. COMMELIN [14]: 260; J. COMMELIN [17]: 260); 361. *Sanguis draconis Officin.* [...] (J. COMMELIN [18]: 86).- CHELSEA: 177. *Draco Arbor* [...] (RAND [64]: 32); 148. *Sanguis draconis; officin.* [...] (MILLER [48]: 148); 8. *Palma. Yuccae foliis* [...] (RAND [68]: 150).- NOTES: As early as 1494, a specimen of the dragon-tree, a species then known only from the Macaronesian islands, was cultivated in the monastery of the Holy Trinity in Lisbon (DE PAZ-SÁNCHEZ [21]), with another one reported in the grounds of the Convent of Our Lady of Grace, in the same city (CLUSIUS [8]). LINNAEUS [43] (based on BOERHAAVE [6] and VAN ROYEN [87]) listed this taxon for the Botanic Garden of Leiden by 1720 and 1740.

***Euphorbia balsamifera* Aiton subsp. *balsamifera* (Euphorbiaceae), NAT**

AMSTERDAM: *Tithymalus canariensis frutescens* [...] (J. COMMELIN [16]: 209, t. 105; C. COMMELIN [10]: 24; Moninckx Atlas 5, t. 32 [Maria Moninckx (1699-1700)]).- NOTES: J. COMMELIN [16] stated that this species was introduced to the Botanic Garden of Amsterdam by François de Vroede in 1699.

***Euphorbia canariensis* L., CAN**

AMSTERDAM: *Tithymalus aizoides fruticosus* [...] (J. COMMELIN [16]: 207, t. 204; C. COMMELIN [10]: 11, 20; Moninckx Atlas 5, t. 31 [Maria Moninckx (1686-1700)]).- CHelsea: 170. *Euphorbium*; *officin Euphorbium*; [...] (MILLER [48]: 42); 5. *Euphorbium tetragonum*, & *pentagonum* [...] (RAND [68]: 75).- CLIFFORD: 2. *Euphorbia aculeata quadrangularis* [...] (LINNAEUS [41]: 196).- NOTES: LINNAEUS [41-42] (based on BOERHAAVE [6] and VAN ROYEN [87]) listed this taxon for the Botanic Garden of Leiden by 1720 and 1740. AITON [3] (based on a manuscript located in the Sloane's collection of the British Library [reference: MS 3357, f. 21]) reported the species for the gardens of the Duchess of Beaufort by 1697.

***Foeniculum vulgare* Mill. (Apiaceae), NAT (Azores, Canaries, Madeira, Cape Verde)**

CHelsea: 5. *Foeniculum Azoricum*. Pluk. Alm. (RAND [68]: 77).

***Hypericum canariense* L. (Hypericaceae), MAC (Canaries and Madeira)**

AMSTERDAM: *Hypericum frutescens canariense* [...] (J. COMMELIN [16]: 135, t. 68; Moninckx Atlas 4, t. 16 [unknown artist (1686-1700)]).- CLIFFORD: 9. *Hypericum floribus trigynis* [...] (LINNAEUS [41]: 381, BM000646815).- NOTES: LINNAEUS [41-42] (based on BOERHAAVE [6] and VAN ROYEN [87]) listed this taxon for the Botanic Garden of Leiden by 1720 and 1740. AITON [4] (based on manuscripts located in the Sloane's collection of the British Library [reference: MS 525, and MS 3343]) reported this species for the gardens of the Duchess of Beaufort by 1699.

***Isoplexis canariensis* (L.) J.W. Loudon (Scrophulariaceae), CAN**

AMSTERDAM: *Digitalis acanthoides canariensis* [...] (J. COMMELIN [16]: 105, t. 53; Moninckx Atlas 3, t. 51 [Jan Moninckx (1686-1700)]).- CHelsea: 7. *Digitalis, Canariensis*; *acanthoides* [...] (RAND [68]: 69).- CLIFFORD: 2. *Gesneria foliis lanceolatis* [...] (LINNAEUS [41]: 318, BM000646182).- NOTES: MILLER [51] indicated (without giving a particular date) that this species was first grown in England at the gardens of the Bishop of London at Fulham and also at the gardens of Hampton Court. LINNAEUS [41] (based on BOERHAAVE [6]) listed this taxon for the Botanic Garden of Leiden by 1720. AITON [3] (based on a manuscript located in the Sloane's collection of the British Library [reference: MS 3358, f. 20]) reported this species for the gardens of the Duchess of Beaufort by 1698.

***Jasminum azoricum* L. (Oleaceae), MAD**

AMSTERDAM: *Jasminum Azorium trifoliatum* [...] (J. COMMELIN [15]: 159, t. 82; Moninckx Atlas 2, t. 18 [Jan Moninckx (1686-1690)]); *Jasminum Azoricum flore* [...] (J. COMMELIN [17]: 172).- CHelsea: 564. *Jasminum Azoricum, trifolium* [...] (RAND [65]: 2, BM000810172); 6. *Jasminum Azoricum, trifoliatum* [...] (RAND [68]: 103).- CLIFFORD: 2. *Jasminum foliis oppositis* [...] (LINNAEUS [41]: 5, BM000557520; BM000557520).- NOTES: J. COMMELIN [15] reported the species from the Azores Islands; however, this taxon is not known to occur on these islands. In addition, he stated that the species was cultivated in the *Hortus Beaumontianus* (Holland) by 1693. LINNAEUS [41] listed this species for Azores, Madeira, Sri Lanka, and India. LINNAEUS [41-42] (based on BOERHAAVE [6], HERMANNUS [34], and VAN ROYEN [87]) listed this taxon for the Botanic Garden of Leiden by 1687, 1720 and 1740. AITON [2] (based on MILLER [49]) reported this species for the Royal Gardens of Hampton Court by 1731.

***Jasminum odoratissimum* L., MAC (Canaries and Madeira)**

CLIFFORD: 4. *Jasminum foliis alternis* [...] (LINNAEUS [41]: 5, BM000557523).- NOTES: LINNAEUS [41] (based on BOERHAAVE [6]) listed this taxon for the Botanic Garden

of Leiden by 1720. AITON [2] (based on MILLER [49]) reported this species for the Royal Gardens of Hampton Court by 1730. HARVEY [32] indicated that this species was cultivated in the nursery of George Rickets by 1688.

***Justicia hyssopifolia* L. (Acanthaceae), CAN**

AMSTERDAM: Moninckx Atlas 8, t. 38 [Maria Moninckx (1686-1706)].- **CLIFFORD:** 2. *Justicia foliis lineari-lanceolatis* [...] (LINNAEUS [41]: 10, BM000557558).- **NOTES:** PLUKENET [62] based his polynomial description for this taxon on material grown by George London at the Royal Gardens under William III. LINNAEUS [41-42] (based on BOERHAAVE [6], MORISON [52], and VAN ROYEN [87]) listed this taxon for the Oxford Botanic Garden by 1699 and for the Botanic Garden of Leiden by 1720 and 1740. AITON [2] (based on MILLER [50]) reported this species for the Royal Gardens of Hampton Court by 1690.

***Kleinia neriifolia* Haw. (Asteraceae), CAN**

CLIFFORD: 1. *Kleinia foliis lanceolatis* [...] (LINNAEUS [41]: 395).- **NOTES:** LINNAEUS [41] listed this species for the Canaries and the East Indies, and based on DILLENIIUS [23] he reported this species for the James Sherard's garden at Eltham (London) by 1732. AITON [4] (also based on DILLENIIUS [23]) reported this species for the gardens of James Sherard by 1732.

***Lavandula canariensis* Mill. subsp. *canariensis* (Lamiaceae), CAN**

AMSTERDAM: *Lavandula folio longiore* [...] (C. COMMELIN [11]: 27, t. 27; Moninckx Atlas 6, t. 43 [Jan Moninckx (1703-1705)]).- **CHELSEA:** 6. *Lavandula Canariensis: spica* [...] (RAND [68]: 111); 1475 *Lavandula Canariensis, spica* [...] (WILMER [96]: 397, specimen not found).- **NOTES:** According to WILMER [96] a specimen of "*Lavandula Canariensis*" from material cultivated at the Chelsea Physic Garden was sent from this garden to the Royal Society under number "397"; however, we were unable to locate this specimen at BM. UPSON & ANDREWS [86] claimed that one of the specimens found in the Sloane herbarium was the material sent to the Royal Society; however, based on the BM records none of the specimens received by this society from Chelsea Physic Garden was filed in the Sloane herbarium. We believe that the polynomial descriptions provided by RAND [68] and WILMER [95] refer to this taxon as according to MILLER [51] and UPSON & ANDREWS [86] *L. canariensis* was already in cultivation in the garden of Bishop Compton (1632-1713) who was Bishop of London in Fulham by 1675.

***Lotus jacobaeus* L. (Fabaceae), CAP**

AMSTERDAM: *Lotus angustifolia flore* [...] (J. COMMELIN [16]: 165, t. 83; Moninckx Atlas 4, t. 33 [Jan Moninckx (1699)]).- **CLIFFORD:** 7. *Lotus caule herbaceo* [...] (LINNAEUS [41]: 372, BM000646728).- **NOTES:** J. COMMELIN [16] indicated that seeds of this species were sent in 1699 by W. A. der Stel (1664-1733) when he visited the island of Santiago (Cape Verde Archipelago) during his trip to South Africa, where he was appointed Governor of the Cape Colony. LINNAEUS [42] (based on VAN ROYEN [87]) list this taxon for the Botanic Garden of Leiden by 1740. AITON [4] (based on material located the Sloane's Herbarium at BM [reference: HS 134, f. 41]) reported this species in the gardens of the Duchess of Beaufort by 1714.

***Persea indica* (L.) Spreng. (Lauraceae), MAC (Azores, Canaries, and Madeira)**

CLIFFORD: 4. *Laurus foliis lanceolatis* [...] (LINNAEUS [41]: 154, BM000558698).- **NOTES:** LINNAEUS [41] reported this species only for the New World. LINNAEUS [41] (based on BOERHAAVE [6]) reported this species for the Botanic Garden of Leiden by 1720. According to AITON [3] (based on REA [69]), the species was cultivated in England by 1665.

***Phyllis nobla* L. (Rubiaceae), MAC (Canaries, and Madeira)**

CHELSEA: Canary Simpla-nobla (PETIVER [57]: 215); 4. *Bupleuroides; quae Simpla-Nobla* [...] (RAND [68]: 37).- **CLIFFORD:** 1. *Phyllis. Bupleuroides, quae Simpla nobla* [...] (LINNAEUS [41]: 87, BM000558215).- **NOTES:** LINNAEUS [40-41] (based on BOERHAAVE [6], DILLENIIUS [23], VAN ROYEN [87], and WALTHERUS [90]) listed this taxon for the Botanic Garden of Leiden by 1720 and 1740, for the gardens of A. F. Waltherus in Leipzig by 1735, and for the James Sherard's garden at Eltham by 1732. AITON [2] (based on a manuscript located in the Sloane's collection of the British Library [reference: MS 3343]) reported this species for the gardens of the Duchess of Beaufort by 1699.

***Rumex lunaria* L. (Polygonaceae), CAN**

CHELSEA: 10 Canary Tree Sorrel [...] (PETIVER [57]: 180); 12. *Acetosa Arborescens, ex Insulis* [...] (RAND [68]: 5); 1102. *Acetosa arborescens, ex Insulis* [...] (MILLER [47]: 213, BM000810170).- **CLIFFORD:** 8. *Rumex floribus hermaphroditis* [...] (LINNAEUS [41]: 139, BM000558578).- **NOTES:** LINNAEUS [41-42] (based on BOERHAAVE [6] and VAN ROYEN [87]) listed this taxon for the Botanic Garden of Leiden by 1720 and 1740. AITON [2] (based on a manuscript located in the Sloane's collection of the British Library [reference: MS 3358]) reported this species for the gardens of the Duchess of Beaufort by 1698.

***Salvia canariensis* L. var. *canariensis* (Lamiaceae), CAN**

CHELSEA: 110. Canary Clary. Ray [...] (PETIVER [60]: 358).- **CLIFFORD:** 12. *Salvia foliis hastato-triangularibus* [...] (LINNAEUS [41]: 13, BM000557604).- **NOTES:** LINNAEUS [41-42] (based on BOERHAAVE [6], MORISON [52], and VAN ROYEN [87]) listed this taxon for for the Oxford Botanic Garden by 1699 and for the Botanic Garden of Leiden by 1720 and 1740. AITON [2] (based on a manuscript located in the Sloane's collection of the British Library [reference: MS 3357, f. 62]) reported this species for the gardens of the Duchess of Beaufort by 1697.

***Semele androgyna* (L.) Kunth (Asparagaceae), MAC (Canaries, and Madeira)**

CHELSEA: Palma Horse-tongue [...] (PETIVER [57]: 199).- **CLIFFORD:** 4. *Ruscus foliis margine* [...] (LINNAEUS [41]: 466, BM000647527).- **NOTES:** LINNAEUS [41-42] (based on DILLENIIUS [23]) listed this taxon for the James Sherard's garden at Eltham by 1732. AITON [4] (based on PETIVER [57]) reported this species for the Royal Gardens of Hampton Court by 1713.

***Sideritis canariensis* L. (Lamiaceae), CAN**

AMSTERDAM: *Stachys canariensis, frutescens* [...] (J. COMMELIN [16]: 197, t. 99; Moninckx Atlas 4, t. 50 [Jan Moninckx (1686-1700)]).- **CHELSEA:** 111. White Canary Horehound [...] (PETIVER, [60]: 358); 11. *Stachys Canariensis, frutescens* [...] (RAND [68]: 190); 1092 *Stachys Canariensis frutescens* [...] (MILLER [46]: 423, BM000810165).- **CLIFFORD:** 5. *Stachys fruticosa foliis* [...] (LINNAEUS [41]: 310, BM000646052).- **NOTES:** LINNAEUS [41] (based on BOERHAAVE [6] and MORISON [52]) listed this taxon for the Oxford Botanic Garden by 1699 and for the Botanic Garden of Leiden by 1720. AITON [3] (based on a manuscript located in the Sloane's collection of the British Library [reference: MS 3357, f. 67]) reported the species for the gardens of the Duchess of Beaufort by 1697. HALLIWELL [31] indicated that this species was already in cultivation in the Botanic Garden of Oxford by 1658.

***Solanum pseudocapsicum* L. (Solanaceae), INT**

CHELSEA: 54. Cherry Nightshade Ray [...] (PETIVER [59]: 272).

***Teline canariensis* (L.) Webb & Berth. (Fabaceae), CAN**

AMSTERDAM: *Cytisus canariensis sempervirens* [...] (J. COMMELIN [16]: 103, t. 52; Moninckx Atlas 3, t. 50 [Maria Moninckx (1686-1699)]).- **CHELSEA:** Yellow Canary Cytisus [...] (PETIVER [55]: 419); 6. *Cytisus Canariensis, microphyllus* [...] (RAND [68]: 67); 1465 *Cytisus Canariensis, microphyllus* [...] (WILMER [96]: 397, BM000810164).- **CLIFFORD:** 6. *Genista foliis ternatis*. (LINNAEUS [41]: 355, BM000646557).- **NOTES:** LINNAEUS [44] (based on VAN ROYEN [87]) listed this taxon for the Botanic Garden of Leiden by 1740. AITON [4] (based on TRADESCANT [85]) reported this species for the gardens of John Tradescant by 1656.

3. DISCUSSION

3.1. Macaronesian plants grown in the botanic gardens

A total of 29 taxa from the Macaronesian islands were cultivated in at least one of these three gardens. Two of them are non-native species from the New World including one weed (*Solanum pseudocapsicum*) and the cultivated pepper (*Capsicum annuum*). There are three native taxa that also occur in the mainland. One of them, *Foeniculum vulgare* has a widespread cosmopolitan distribution, although it is originally from the Old World. The second one, *Aizoon canariense*, also occurs through the Mediterranean Basin, Africa, and the Middle East reaching India and Australia. The third taxon, *Euphorbia balsamifera* subsp. *balsamifera* is also found in Morocco, Mauritania, and Senegal. The rest of the taxa are endemics in at least one of the Macaronesian archipelago. There is a single endemic from Madeira (i.e., *Jasminum azoricum*) and Cape Verde (*Lotus jacobaeus*). Fifteen of the species are Canary Island endemics and the rest of the taxa (i.e., *Cedronella canariensis*, *Dracaena draco* subsp. *draco*, *Hypericum canariense*, *Jasminum odoratissimum*, *Persea indica*, *Phyllis nobla*, and *Semele androgyna*) are endemic to more than one Macaronesian archipelago.

Only two catalogues from the Botanic Garden on Amsterdam (i.e., CORNELII [19]; SNIPPENDAEL [80]) and three of the relevant publications listing material grown at Chelsea Physic Garden [i.e., PETIVER [54, 56, 58] did not include any plants from the Macaronesian Islands. Likewise the unpublished British Library manuscript that records those plants found at Chelsea Physic Garden by 1706 does not have any reference for Macaronesian material either.

Among the 29 taxa recorded in our study only seven were cultivated in a single botanic garden, 13 of them were grown in two of these gardens, and the remaining nine were listed for all three gardens. With 24 taxa, the Clifford's Hartekamp Gardens had the highest number of taxa from Macaronesia whereas the Botanic Garden of Amsterdam reported the lowest number (i.e., 15 taxa) of collections from this region. The publications from the Chelsea Physic Garden listed 21 taxa as collected in the Macaronesian Islands.

It is noteworthy that the vast majority of the native/endemic taxa grown in these three gardens were also reported in cultivation in other gardens from England, Germany, and the Netherlands. Interestingly, we did not find reports for these taxa in any botanical collections from the rest of Europe. *Euphorbia balsamifera* subsp. *balsamifera* (listed for the Botanic Garden of Amsterdam) was the only taxon that was not reported for any in other European gardens.

All available records show *Dracaena draco* as the earliest cultivated Macaronesian species in Europe. This species and its East African relatives (primarily *D. cinnabari* Balf. f.) produce a sap that is the source of “Dragon’s Blood” an ancient medicine with ample utilization in the Western culture and that also has been used as coloring and varnishing material (reviewed by GUPTA *et al.* [30] and SÁNCHEZ-PINTO & ZÁRATE [70]). Species of this group also have a strong mythological meaning as they were considered to be the “Dragon Trees” that resulted from the red blood of the dragon Landon after it was killed by Hercules. Landon was the hundred-headed dragon that guarded the Garden of Hesperides (GUPTA *et al.* [30]). In addition, this species was a common element in several paintings depicting the Garden of Eden between the 15th and 17th centuries (reviewed by SANTOS-GUERRA [73]).

3.2. Sources for Macaronesian plants growing in the botanic gardens

In a previous study, FRANCISCO-ORTEGA & SANTOS-GUERRA [24] reported a three folio manuscript from the Sloane’s collection of the British Library listing a shipment of seeds and trees from the Canary Islands made to Samuel Doody in 1694. It is known that Samuel Doody (1656-1706) was apothecary and curator of the Chelsea Physic Garden of London from 1693 until his death in 1706 (JACKSON [38]), although DESMOND [20] indicated that he began his connection with the gardens in 1692. Therefore it is likely that this material (68 accessions for 47 species, 23 of the taxa endemic to the Macaronesian region) was sent to Doody in order to enlarge the living collections of Chelsea Physic Garden. However, only seven of these species (i.e., *Argyranthemum frutescens*, *Cedronella canariensis*, *Convolvulus canariensis*, *Phyllis nobla*, *Rumex lunaria*, *Salvia canariensis*, and *Sideritis canariensis*) were reported as cultivated in the earliest available lists of living material for Chelsea, published by PETIVER [55, 57, 60] between 1710 and 1714. We are aware that there is a 16 year gap between Petiver’s publications and the time when this shipment was sent; therefore, we cannot rule out that some of these earliest introductions did not survive the severe climatic conditions of London.

In this previous study, FRANCISCO-ORTEGA & SANTOS-GUERRA [24] also indicated that during the 16th and 17th centuries there were extensive commercial links between England and the Canary Islands that involved trading companies such as the “Canary Company”. It was suggested that some of the merchants engaged with these enterprises might have facilitated the introduction of Macaronesian plants into the earliest gardens of England and the rest of Europe (FRANCISCO-ORTEGA & SANTOS-GUERRA [24]). For instance, the earliest reference for the potatoes in the New World is found in two shipments from the Canary Islands to Belgium and France in 1567 and 1674, respectively (HAWKES & FRANCISCO-ORTEGA [33]).

During these centuries the Macaronesian archipelagos were also a major hub for vessels travelling from Europe to Asia, Africa and to the New World. Our study also shows that occasional travelers who visited the islands during their journeys to other countries also played a role in the early introduction of Macaronesian plants in European gardens. The best example is provided by the Cape Verde endemic *Lotus jacobaeus*, reported by J. COMMELIN [16] as introduced in the Netherlands by W. A. der Stel after his trip to South Africa. Our study shows that the vast majority of the species grown in these three gardens were also widely cultivated in other gardens by the late 17th century and the middle of the 18th century supporting that there was extensive exchange of plant material between several European gardens. We know that Linnaeus travelled to England in 1736 and that during this trip he visited the Chelsea

Physic Gardens where he met the garden's chief botanist Phillip Miller (1691-1771) and acquired material for the Clifford's Hartekamp Gardens (JARVIS [40]). We also know that he was a close friend of the Prefect of the Botanic Garden of Leiden, the great Herman Boerhaave (1668-1738) (VEENDORP & BAAS BECKING [88]). As highlighted by STEARN [82] and WIJNANDS & HENIGER [93] there was an early network of botanists working in several botanic gardens who clearly facilitated the exchange of plant material between these institutions.

3.3. The legacy of plant hunters

Because of a legendary history tied to ancient Roman and Greek accounts (BLÁZQUEZ MARTÍNEZ [5]) and their proximity to the European mainland the Macaronesian Islands have been highly attractive for European naturalists and travelers (FRANCISCO-ORTEGA *et al.* [27]). Therefore they were a focus for early plant hunters and explorers. These plant collectors paved the way for contemporary botanists who visited the islands after 1753. Among them there was the first official field botanist of the Royal Botanic Gardens, Kew, Francis Masson (1751-1805) who stayed in the Azores, the Canaries and Madeira between 1776 and 1779 and who sent plant material both to Linnaeus and his son (FRANCISCO-ORTEGA *et al.* [26]). Masson's expedition is the first one focusing only on the Macaronesian Islands with the aim of obtaining both herbarium specimens and material to be cultivated at Kew. Indeed the three volumes of *Hortus Kewensis* listed over 98 species from these archipelagos that were collected by Francis Masson (AITON [2-4]). In addition, Masson's collections led to the description of over 118 Macaronesian endemics by distinguished taxonomists such as William Aiton (1731-1793), Nicolaus J. Jacquin (1727-1817), Charles-Louis L'Héritier (1746-1800), Johann H. F. Link (1767-1851), Linnaeus filius (1741-1783), and Leopold von Buch (1774-1853) (FRANCISCO-ORTEGA *et al.* [26]).

Prior to Francis Masson there were three other documented expeditions that resulted in plant hunting; however, these expeditions did not have Macaronesia as their final destination. They stopped in the islands during their journeys to Jamaica (Sloane in Madeira in 1687), China [James Cuninghame (1665?-1709) in La Palma in 1698], and around the world [Sir Joseph Banks (1743-1820) and Daniel Solander (1733-1782) with James Cook (1728-1779) in Madeira in 1768] (FRANCISCO-ORTEGA *et al.* [26], SANTOS-GUERRA *et al.* [74], SEQUEIRA *et al.* [76]). Furthermore, these expeditions did not have as a primary focus to collect plant material to be cultivated in botanic gardens. We argue that the initial history of plant exploration in the Macaronesian Islands can be divided into three main sequential stages or phases: (1) the Merchant Phase in which we believe most of the collections were made by those directly involved with trading between the archipelagos and Europe, (2) the Early Scientific Phase in which a few pre-Linnaean botanists collected in the islands to enrich the early European gardens, museum, and botanical institutions, and (3) the Linnaean-Masson Phase in which Linnaeus established the foundations for modern plant systematics and Masson visited the Azores, Canaries, and Madeira. Indeed Linnaeus passed away during the journeys of Masson to Macaronesia, and a condolence letter from Madeira (dated 12 December 1778) was sent to Linnaeus filius by Masson (FRANCISCO-ORTEGA *et al.* [26]). This third phase resulted in many valid taxonomic descriptions for Macaronesian endemics (see above).

Following Masson's steps many other famous European naturalists visited the islands and collected plant material to enrich the collections of the most important European natural history museums and botanical gardens and to provide the basis for floristic accounts and the description of new taxa (HERRERA PIQUÉ [35]). Distinguished post-Masson botanists who

conducted extensive field studies in Macaronesia during the 18th and 19th centuries included Auguste Broussonet (1761-1807), André Pierre Ledru (1761-1825), Alexander Von Humboldt (1769-1859), Aimé Bonpland (1773-1858), Jean Baptiste Bory de Saint-Vincent (1778-1846), Christen Smith (1785-1816), Philip-Barker Webb (1793-1854), Jean-Marie Despreaux (1794-1843), Richard T. Lowe (1802-1874), Eugène Bourgeau (1813-1877), Otto Kuntze (1843-1907), and Hermann Christ (1833-1933). The impact made by these expeditions in collecting herbarium specimens is well known; however, there are still historical gaps concerning how these expeditions enriched the living collections of the European botanic gardens and became part of the horticulture trade.

Through his journeys along Latin America, Europe, and Asia the great Chilean poet Pablo Neruda (1904-1973) found inspiration to write five extraordinary essays on the value of poetry, the mysterious beauty of nature, and the dreams of those living in these regions (NERUDA [53]). These works were compiled in a single book entitled "*Viajes*" (translated as "*Journeys*") that was published in 1955. Later in 1971, when he received the Nobel Prize in Literature, Neruda delivered a lecture in which he highlighted how these long journeys were essential components for his writings. This Nobel lecture was entitled "*Hacia la Ciudad Espléndida*" (translated as "*Towards the Splendid City*") and a few lines of this text are found in the preface of this paper.

Like Neruda, many plant explorers from the 18th and 19th centuries were deeply inspired by the remote regions that they visited. They found plants with striking beauty and immense landscapes harboring a mysterious flora. They witnessed the great value of plants for different human societies, providing food and medicines (STEARN [81]). Many of these early plant hunters (including seven of the 17 Linnaeus' Apostles) died during these journeys. The most immediate legacy of these plant hunters was to bring herbarium specimens for their botanical institutions; however, in many cases they also collected material that was eventually grown in private and public gardens. These gardens and their living collections perhaps provide the strongest evidence of the lasting inspiration derived from these early expeditions.

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Table 1.- The 29 taxa from the Macaronesian Islands that were grown at the Botanic Garden of Amsterdam (coded as **Amsterdam**), the Chelsea Physic Garden (coded as **Chelsea**), and the Clifford's Hartekamp Gardens (coded as **Clifford**). Years when the taxa were reported are indicated.

Taxon	Amsterdam	Chelsea	Clifford
<i>Aeonium canariense</i> (L.) Webb & Berth.	1701	1739	1738
<i>Aizoon canariense</i> L.		1739	1738
<i>Argyranthemum frutescens</i> (L.) Sch. Bip. subsp. <i>frutescens</i>		1710, 1739	1738
<i>Bosea yervamora</i> L.		1739	1738
<i>Bystropogon canariensis</i> (L.) L. Hér. var. <i>canariensis</i>	1701	1739	1738
<i>Canarina canariensis</i> (L.) Vatke		1737, 1739	1738
<i>Capsicum annuum</i> L.			1738
<i>Cedronella canariensis</i> (L.) Webb & Berth.	1701, 1703	1710, 1739, 1749	1738
<i>Convolvulus canariensis</i> L.	1701	1710, 1731, 1739	1738
<i>Dracaena draco</i> (L.) L. subsp. <i>draco</i>	1689, 1702, 1724	1730, 1739	
<i>Euphorbia balsamifera</i> Aiton subsp. <i>balsamifera</i>	1701, 1703		
<i>Euphorbia canariensis</i> L.	1701, 1703	1730, 1739	1738
<i>Foeniculum vulgare</i> Mill.		1739	
<i>Hypericum canariense</i> L.	1701		1738
<i>Isoplexis canariensis</i> (L.) J.W. Loudon	1701	1739	1738
<i>Jasminum azoricum</i> L.	1697, 1702	1735, 1739	1738
<i>Jasminum odoratissimum</i> L.			1738
<i>Justicia hyssopifolia</i> L.	Between 1687 and 1706		1738
<i>Kleinia neriifolia</i> Haw.			1738
<i>Lavandula canariensis</i> Mill. cf. subsp. <i>canariensis</i>	1706	1739, 1751	
<i>Lotus jacobaeus</i> L.	1701		1738
<i>Persea indica</i> (L.) Spreng.			1738
<i>Phyllis nobla</i> L.		1713	1738
<i>Rumex lunaria</i> L.		1713, 1746	1738
<i>Salvia canariensis</i> L. var. <i>canariensis</i>		1714	1738
<i>Semele androgyna</i> (L.) Kunth		1713	1738
<i>Sideritis canariensis</i> L.	1701	1714, 1739	1738
<i>Solanum pseudocapsicum</i> L.		1714	
<i>Teline canariensis</i> (L.) Webb & Berth.	1701	1710, 1739, 1751	1738



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