



# Exploring the Leiden ‘Van Royen herbarium’: History and scientific significance of the herbarium specimens of Adriaan (1704–1779) and David van Royen (1727–1799)

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## Key words

Albrecht von Haller  
Carl Linnaeus  
Carl Peter Thunberg  
*Ericetum Africanum*  
*Florae Leydensis Prodrum*  
history of botany  
Johann Gerhard König  
Joseph Gaertner  
Leiden botanical garden  
Nicolaas Meerburg  
printed herbarium ornaments  
typification

**Abstract** The dried plant collection, now known as the ‘Van Royen herbarium’, was assembled by Adriaan and David van Royen, successive Leiden professors of botany in the period 1729–1799. The significance of this herbarium is partly due to the fact that Linnaeus was able to study Adriaan’s collections extensively when he stayed in The Netherlands, such that it must have influenced, to some extent, his subsequent publications, notably *Species Plantarum* (1753). In this review we track the complex history of the herbarium and follow its physical housing through time. Poor storage conditions in the 18th and 19th centuries may account for the loss of an unknown number of specimens originally in the herbarium. The history of the herbarium of Nicolaas Meerburg, head gardener in the Leiden botanical garden from 1774–1814, where he had worked from 1752, is closely connected with that of the Van Royens, and is also discussed here. We explore the composition of the ‘Van Royen herbarium’ and document who contributed to it. Altogether 80 plant collectors or original herbarium owners are identified. For example, there is a substantial set of specimens collected by Carl Peter Thunberg in Japan and many specimens from the Cape region of South Africa, which must have been gathered by him during his first stay there. Another large set is that collected by Johann Gerhard König in Ceylon (nowadays Sri Lanka) and there are many specimens from the collections of Albrecht von Haller and Sébastien Vaillant. The herbarium contains several seed collections used for Joseph Gaertner’s *De Fructibus* (listed in Appendix 4) and also many specimens assembled by Adriaan van Royen for his *Ericetum Africanum* project. Last, but not least significant among the rest, there are specimens cut out of a book herbarium owned by Jacob Breyne with plants collected by Carolus Schweiker (or Sweiker) around Montpellier (France) in 1666. Information necessary for the correct attribution of specimens is presented, complete with information enabling attribution of individual specimens to their original owners. Example barcodes of specimens from individual contributors and their handwriting(s) can be found in Appendix 3. Brief details of the life and work of Adriaan and David van Royen is given in Appendices 1 and 2. The significance of the herbarium for the typification of Linnaean and other species names is discussed.

**Citation:** Thijsse G, Mabberley DJ, Baas P. 2023. Exploring the Leiden ‘Van Royen herbarium’: History and scientific significance of the herbarium specimens of Adriaan (1704–1779) and David van Royen (1727–1799). *Blumea* 68 (2): 85–138. <https://doi.org/10.3767/blumea.2023.68.02.02>. Effectively published online: 18 September 2023.

## INTRODUCTION

In 1800 the ‘Van Royen herbarium’ was bought by Leiden University for use in botanical teaching for medical students in the Leiden botanical garden (Molhuysen 1924, Vol. 7: 155). This herbarium, which was set up by Adriaan van Royen (1704–1779), was continued by his nephew and successor, David van Royen (1727–1799). Both were professors of botany in Leiden and, therefore, also successively directors of the Leiden botanical garden. Their joint collection, now numbering around 10 000 specimens, includes not only seed plants, but also c. 900 ferns, mosses, algae, lichens and fungi. The collections are important because those of Adriaan were studied by Linnaeus when he was in The Netherlands in the period June 1735–May 1738. In the introduction to his *Species Plantarum*

(1753), Linnaeus lists it among the herbaria that were known to him. That he was well acquainted with Adriaan’s specimens is evident from what he wrote in a letter to the Norwegian botanist Johan Ernst Gunnerus (1718–1773) in 1770: ‘Saxifr. groenlandica specimine sicco non est in meo collectione. Vidi specimen olim in Herbario Royeni (There is no dried specimen of *Saxifraga groenlandica* [L.] in my collection. I have seen it only in the herbarium of Van Royen)’ (Amundsen 1976: 113).

Even though Linnaeus spent most of his time in The Netherlands at Clifford’s estate, the ‘Hartekamp’ near Haarlem, there were several opportunities for him to study Van Royen’s collections. He paid monthly visits to the gardens of Amsterdam, Utrecht and Leiden (Pulteney 1805: 43–45, 533). In the summer of 1736, he was in Leiden for a few weeks, during which time he could study not only the herbarium collections of Van Royen and Gronovius, whom he helped write the *Flora Virginica* (Gronovius 1739–1743), but also the plants growing in the Leiden botanical garden and other gardens around Leiden (De Gorter 1778: 125). Especially importantly, during the winter of 1737/1738, Linnaeus stayed in Leiden to help Adriaan in the re-arrangement of the Leiden botanical garden (Linnaeus 1826: 30–31).

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In the course of the herbarium's history, Adriaan and David van Royen's specimens have been merged with other collections, such as those of the 'Rijksherbarium' (now Naturalis Biodiversity Center, Leiden, henceforth Naturalis) that was established in Brussels in 1829. During the turmoil engendered by the Belgian uprising of 1830 it was moved to Leiden. Its collections were stored, together with those of Leiden university (the 'Academy herbarium'), in the botanical garden. Shortly after the move, it was decided that the collections of the Academy herbarium, consisting of the 'Van Royen herbarium' and the later acquired collections of the Heidelberg professor of agriculture, forestry and technology, Christoph Wilhelm Jacob Gatterer (1759–1838) and Nicolaas Meerburg (1734–1814), should be added to those of the Rijksherbarium (Van Steenis-Kruseman 1979: 29). Both herbaria were eventually housed in a building at Rapenburg 33, Leiden.

At the end of the 19th century, in preparation for the impending transfer to a new building in the nearby Nonnensteeg, the then separate collections were amalgamated into a general herbarium (Goethart 1931: 47, 49–50). This work took five years and was completed when the new building was ready to be occupied in 1912 (Goddijn 1931: 28). In this process the original arrangement of the specimens in the 'Van Royen herbarium' and that of Meerburg was completely lost, which now complicates any attribution of particular specimens to one of the Van Royens. This is not only because Meerburg's herbarium contained (duplicate) specimens from the Van Royens (Anonymous 1816: 214), but also a set of plants from the herbarium of the Leiden burgomaster and amateur botanist, Johan Frederik Gronovius (1686–1762) (Kronfeld 1921: 143), who also contributed to the 'Van Royen herbarium'. The fact that both Gronovius and Adriaan van Royen were in possession of specimens from the herbarium of the Leiden professor of medicine and surgery, Bernhard Siegfried Albinus (1697–1770) complicates matters even more. For these reasons this paper also discusses the visible features that should be taken into account when distinguishing between Gronovius's specimens from the Meerburg herbarium and the 'Van Royen herbarium'.

In 1983 it was decided to form a separate collection of all specimens dating from before 1800 for the benefit of biohistorical research and to protect the specimens from damage due to excessive handling (Kalkman 1983: 63). A start with selecting specimens was made in 1985. Up to 1990, the general collection was systematically searched for historical specimens (Kalkman 1985: 68, 1986: 45, 1987: 45, 1988: 50, 1989: 54). Marc Sosef (1960–), research assistant at the Rijksherbarium between 1985 and 1987, searched many of the herbarium folders of specimens of unknown origin, which were known to contain much historical material, thus laying the foundations for the current Leiden historical collections. Subsequently, this herbarium grew with chance finds. To make the collection accessible to the wider research community, an agreement was made in 1998 with the Inter Documentation Company (IDC, now part of Brill publishers, Leiden) to issue a microfiche edition of the 'Van Royen herbarium' (Baas 1998: 55). With the knowledge then available a guide was produced. Using the data including handwritings on specimen labels, an attempt was made to identify the original owners or collectors. While the specimens were being photographed for the microfiche edition, extra efforts were made to locate Van Royen specimens still filed in the general collection. After the completion of the microfiche, the search was continued, as a result of which many more were discovered such that it became necessary to publish a supplement (Thijssse 1998–2002), which can be accessed digitally (Thijssse & Veldkamp 2003). The newly re-assembled 'Van Royen herbarium' was digitised in 2018 and will soon be made available on the internet.

## AIMS AND APPROACH

Because we believe that it is relevant to estimate the possible effects of damage, loss, and confusion of specimens, we first trace the housing and curation of the 'Van Royen herbarium' since its beginnings as the private property of Adriaan and David van Royen. For the study of the physical history of the Van Royen and Meerburg herbarium we made extensive use of the work of Willem Karel Hendrik Karstens (1908–1989), professor of botany and director of the Leiden botanical garden. He searched the archives of curators for information about the Rijksherbarium and the Leiden botanical garden. The results of his study were unpublished, but his report is preserved in the library of Naturalis (Karstens 1983). Much information relayed here, especially with regard to the establishment and first years of the Rijksherbarium, is taken from the unpublished MSc thesis of Den Ouden (1979) on Carl Ludwig Blume (1796–1862), its first director. Subsequently, we discuss the various components of what we now consider to be the original 'Van Royen herbarium', with, as a starting point, the detailed description in the auction catalogue of the Van Royen library and collections, which hitherto has not been consulted as a source (Anonymous 1800: 106–107). Then we discuss the significance of the herbarium, by analysing the role it is thought to have played in Linnaeus's preparation of *Species Plantarum* (1753) and other publications.

The main source of information regarding the content of and contributors to the 'Van Royen herbarium' are, of course, the labels on the herbarium specimens, which were studied by the first author when the herbarium was filmed by IDC, and subsequently in his role as chief collection manager of Naturalis until 2014. In this work the discovery by the first author of the auction catalogue of the library of David van Royen in the National Library of The Netherlands in The Hague (Verz. Cat. 36011), in which the herbarium is described in some detail, giving a good idea of its size and content, proved very important (Anonymous 1800). Further information about the Van Royens and their herbarium was gathered from travel reports written by visitors to the Leiden botanical garden, besides from the correspondence between the Van Royens and Linnaeus (<https://linnean-online.org/correspondence.html>), the Swiss physician and naturalist Albrecht von Haller (Von Haller 1773–1775, <https://hallernet.org/>) and other botanists (<https://www.alvin-portal.org/>). Other sources of information were the Naturalis archives, the Regional Archive of Leiden (<https://www.erfgoedleiden.nl/>) and 'Delpher', a website where digitised historical Dutch newspapers, books and journals can be read (<https://www.delpher.nl/>).

For comparing the different handwritings on the labels in the 'Van Royen herbarium' several digitally available herbaria were examined, namely Linnaeus's own herbarium now at the Linnean Society in London (LINN), besides his specimens in Stockholm (S-LINN), the herbarium of George Clifford in London (BM) and at Naturalis in Leiden (L), as well as the herbarium specimens from Virginia collected by the English botanist John Clayton (1694–1773) in London (BM) and historical herbarium collections in Paris (P). The herbarium acronyms cited here, are standardised following Thiers (continuously updated).

## HISTORICAL ACCOUNT

For short biographies of Adriaan and David van Royen, the reader is referred to Appendices 1 and 2, respectively. It is not known exactly when Adriaan van Royen (Fig. 1) started to collect plants for his herbarium but in his early twenties he made collecting trips together with his friend Johannes Burman (1707–1779) (Van Royen 1728). The earliest date on any of





Fig. 1 Adriaan van Royen at the age of 32. Oil painting by Hieronymus van der Mij, 1736 (Leiden University Library, Special collections, Inv. Icones 157).

his specimens is 1729, the year he became reader in botany. It is on a specimen of *Myriophyllum spicatum* L. (L 0836622, *Haloragaceae*) collected near Katwijk ('t Mallegat'), a coastal town near Leiden.

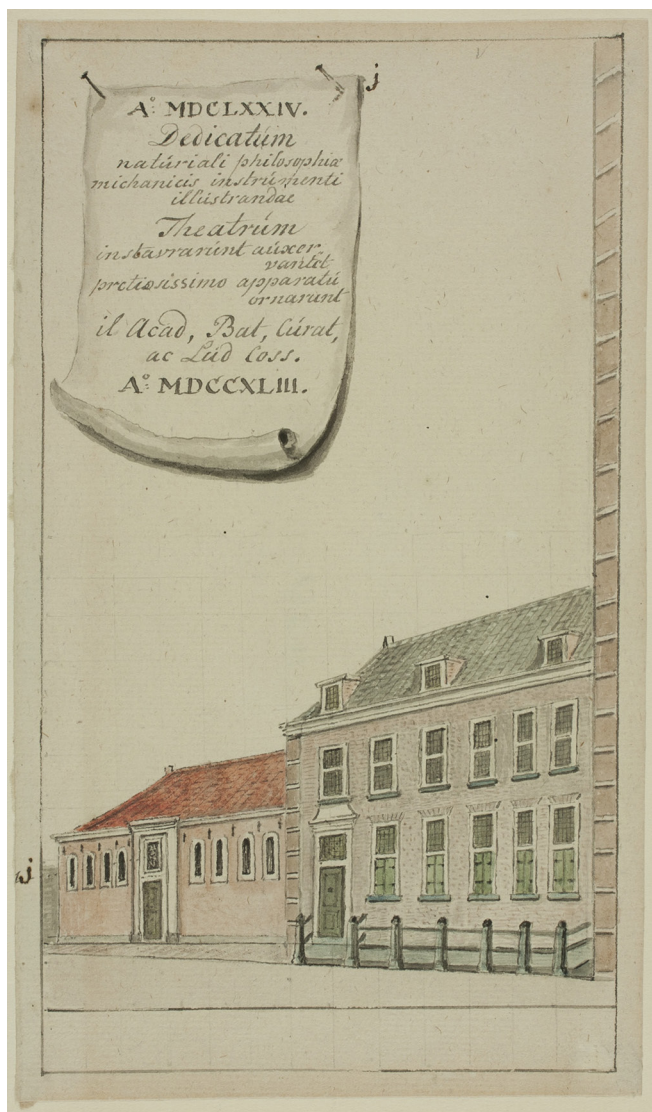
After Adriaan van Royen had taken over the supervision of the Leiden garden from Herman Boerhaave (1668–1738) in 1730, he moved from Noordeinde in Leiden to the official residence for the Leiden professors of botany, in the Nonnensteeg, adjacent to the garden (Anonymous 1730: 46, 1731: 46, 1732: 46, Karstens & Kleibrink 1982: 34, Kooijmans 2011: 241) (Fig. 2). The herbarium specimens Adriaan owned at that time were most probably moved with him. We have not found any information about his herbarium during the period it was in his possession, except that in March 1739 he wrote to Von Haller he was so busy, that he lacked the time to collect new plants to enlarge it (Suringar 1866: 262). In 1754, upon resigning his professorship in botany and his position as director of the botanical garden, Adriaan passed his herbarium to his nephew and successor, David van Royen, after which time David enlarged it considerably.<sup>1</sup>

When the Swedish botanist Carl Peter Thunberg (1743–1828), who was on his way to Paris to complete his studies, visited David van Royen in October 1770, he was shown a collection of Cape plants and specimens that David had recently received from Sri Lanka (Thunberg 1792: 16). Thunberg did not mention where the herbarium was kept, but it was probably in a former part of the east wing of the 'ambulacrum', which had been added to the house of the Professor of Botany to serve as library and/or lecture room. The 'ambulacrum' was the gallery where the natural history collections of Leiden University were exhibited until 1751. It is not known when this conversion took place. However, in 1764 (Karstens & Kleibrink 1982: 42), or 1766 (Terwen-Dionisius 1980: 42–43) the library was extended by another 6 m by moving a wall. Certainly before 1739, the head gardener had occupied four bays of the west wing; in 1773, he was also given access to another three bays (Terwen-Dionisius 1980: 43). Obviously, not much space remained for the collections after that (Fig. 3).

In the Leiden botanical garden, Thunberg was shown another herbarium which was used in the botanical lectures delivered in the garden. In his travelogue he wrote that it consisted of 'all those herbs that had been raised in the garden and had flowered there' (Thunberg 1792: 16). Besides, Meerburg, who had been appointed head gardener that year, showed Thunberg

<sup>1</sup> Writing about his visit to the Leiden botanical garden in 1776, the German professor Heinrich Sander (1754–1782) mentioned that 'das grosses Kräuterbuch' (herbarium) of A. van Royen was under the care of his nephew D. van Royen (Sander 1783: 517).





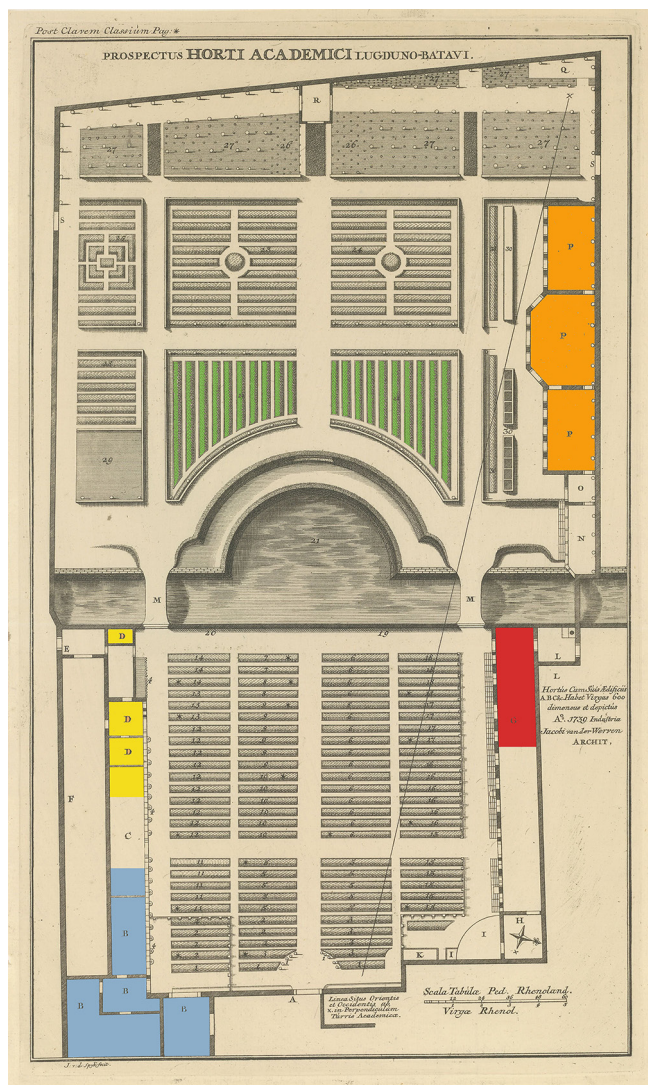
**Fig. 2** The official residence (on the right) for the Professors of Botany in the Nonnensteeg. Colour drawing by Jan Jacob Bylaert (1734–1809), latter part of the 18th century (Erfgoed Leiden en Omstreken, PV 13541).

his natural history collection, including a herbarium (Anonymous 1761: 59, 1785: 68, Thunberg 1792: 16, Sluijter 2004: 291).

In his application in 1786 for an honourable discharge from his professorship, David van Royen asked not only to be allowed free access to the Leiden botanical garden, but also for permission to collect plants there for his herbarium. His requests must have been granted because he was allowed, although at his own expense, to have a small working space in the new orangery built in 1744 (Karstens & Kleibrink 1982: 45; Fig. 3).

The herbarium specimens accumulated by the Van Royens were not considered the property of the university and therefore, when David had to leave the official residence in the Nonnensteeg, he could take them with him to his house at Noordeinde where it was auctioned after his death in March 1800. The curators of Leiden University decided to buy the herbarium collection in order to use it in botanical lectures. The purchase price was not to exceed 800 guilders (Molhuysen 1924, Vol. 7: 155); in fact they paid just 605 guilders (today's value 4718 Euro).<sup>2</sup>

Sebald Justinus Brugmans (1763–1819), who had succeeded David van Royen was asked to curate and enlarge the 'Van Royen herbarium' (Karstens 1983: 1).<sup>3</sup> He was possibly assisted in this task by Hendrik Willem Hazenberg (1780–1850), who was employed as the keeper of dried plants in the Leiden bo-



**Fig. 3** Groundplan of the Leiden botanical garden in Adriaan van Royen's *Florae Leydensis Prodomus* (1740). Copper engraving by Johannes van der Spyk (Erfgoed Leiden en Omstreken, PV13523). Over time, parts of the ambulacrum (C) on the left came into use by the professor of botany (B) and the head gardener (D). This map shows the situation in the mid-1770s. Highlighted here in blue the dwellings of the botany professor; in yellow the parts in use by the head gardener; in orange the new orangery (P) and in green the seed beds that were in use to sow seeds and further raising the plants. In 1826, the Academy herbarium was placed on the first floor built on the remaining western part of the 17th-century orangery (red) (Karstens 1983).

tanical garden in 1814 (Veendorp & Baas Becking 1938: 137). Brugmans placed the 'Van Royen herbarium' in a large room in the residence of the professor of botany in the Nonnensteeg (Karstens 1983: 1). This was probably the very room where it was stored by David. When the Berlin professor of anatomy and physiology, Karl Asmund Rudolphi (1771–1832) visited Leiden in 1802, just a few years after the herbarium was bought, he saw it in a reasonably good condition in Brugmans's house (Rudolphi 1804: 130). This was still the case in 1807 (Molhuysen 1924, Vol. 7: 88, 89).

#### **In the Leiden botanical garden**

After Brugmans's death in June 1819, the director of the botanical garden in Buitenzorg (Bogor, Indonesia), Caspar Georg Carl Reinwardt (1773–1854), was appointed as his successor. However, Reinwardt, who was in Java, could not take up the post until the end of November 1822. Meanwhile, one of Brugmans's

<sup>2</sup> <https://iisg.amsterdam/nl/onderzoek/projecten/hpw/calculate.php>.

<sup>3</sup> Archive of Curators, meeting 21 March 1800. Leiden University Library, AC1, 35 p. 196.





**Fig. 4** The front garden of the Leiden botanical garden. Watercolour (1854) by Willem Lodewijk Andraea (1817–1873). The first floor of the building left was constructed in 1826 to house the Academy herbarium (Erfgoed Leiden en Omstreken, PV 13520).

pupils, Gerard Sandifort (1779–1848), was appointed to act as interim director of the Leiden botanical garden. Sandifort was professor of anatomy and clinical medicine in Leiden, but also had an interest in botany (Veendorp & Baas Becking 1938: 141). When Reinwardt took up his duties on 3 May 1823 he found piles of almost completely decayed specimens in one of the old orangeries (De Vriese 1849: 23) (Fig. 3). Not much had remained of the specimens that had belonged to Linnaeus [!], Boerhaave, Van Royen and others that were kept there. Of what had survived Reinwardt saved what he could (Den Ouden 1979: 64).<sup>4</sup> It must be assumed that a significant number of specimens had by then been lost due to the poor storage conditions. When in 1824 the Austrian botanist Joseph August Schultes (1773–1831) visited the Leiden botanical garden he wrote the following in his travel report:

‘Dieses herbarium ist noch ziemlich gross. Wir sahen noch einen Pack von dem alten Breyn bei diesem herbarium liegen, der um so mehr gerettet zu werden verdient, als das große Breynische herbarium beinahe gänzlich zu Grunde gieng, indem man sich zu Dorpat an demselben, wie mir einst Freund Weinmann schrieb, die Schuhe abputzte, ehe man in den Saal der Bibliothek trat. Ein anderen Pack von Vaillant in welchen dieser scharfsichtigen Botaniker die Namen eigenhändig beigeschrieben hat; mehrere Päck von Thunberg; einige bloss mit der Aufschrift *plantae Capenses*; einige Päck bloss mit der Aufschrift *plantae zeylanenses*, und darunter einer *ex herbario Hermanniano* enthalten Kostbarkeiten, welche allerdings einer besseren Bewahrung entgültig wären.’

*Translation.* ‘This herbarium is still quite large. We saw a parcel with plants of the elder Breyne [= Jacob Breyne

(1637–1697), merchant and botanist from Danzig (modern Gdansk, Poland) (Staffeu & Cowan 1976, Vol. 1: 321)] lying in this herbarium, which deserves to be saved all the more because the large Breyne herbarium was almost completely destroyed, and in Dorpat [modern Tartu, Estonia], as my friend Weinmann [probably the German botanist Johann Anton Weinmann (1782–1858)] once wrote to me, one wiped one’s shoes before entering the library’. Another parcel of Vaillant [the French botanist Sébastien Vaillant (1669–1722)], in which this keen botanist has written the names himself; several parcels from Thunberg; some merely with the inscription ‘*plantae capenses*’; some parcels only with the inscription ‘*plantae zeylanenses*’, and among them one ‘*ex herbario Hermanniano*’ [= Paul Hermann (1646–1695), professor of botany at Leiden (1680–1695)]. Treasures that deserve better housing’.

Schultes further wrote that the Academy herbarium for the greater part of the year was kept in a damp corner, where it was in danger of becoming mouldy (Schultes 1824: 724–725). This damp corner was probably in the remaining part of the ‘ambulatory’ (Fig. 3).<sup>5</sup> To dry the specimens, which became damp in the autumn and winter, they were moved during summer to a building from the time of Boerhaave (Schultes 1824: 724–725), which must be the old orangery where Reinwardt had found them.

In 1825 Reinwardt reported to the curators of the university on the poor state of the herbarium, which was due to the bad

<sup>4</sup> National Archives, The Hague, 2.04.01, Inv. 4370.

<sup>5</sup> Terwen-Dionisius (1981: 72) also mentions the possibility that the Academy herbarium could have been stored in the left wing of the new orangery, where the other natural history collections were stored from 1751.



Fig. 5 Early 20th century photograph of the Rijksherbarium building at Rapenburg 33 (Erfgoed Leiden en Omstreken, PV GN003381).

storage conditions. To overcome such problems in future, an extra floor was to be built on the remaining western part of the 17th-century orangery in the front garden of the Leiden botanical garden (Karstens 1983).<sup>6</sup> This project was completed in June 1826 (Karstens 1983) (Fig. 4). At the request of Reinwardt, the herbarium of Meerburg and that of Gatterer were bought by Leiden University in 1825 (Den Ouden 1979: 64, Karstens 1983), probably as a replacement for the lost specimens. In 1827 Reinwardt asked the curators of the university for funding to maintain the Academy herbarium and the purchase of mounting paper for the specimens (Karstens 1983). It is not known whether his request was granted. Given the year in which Reinwardt made this request, the conservation work and the merging with the herbaria of Meerburg and Gatterer evidently began not long after the herbarium had been moved to its new accommodation in 1826. In this project the pharmacist, Pieter Willem Korthals (1807–1892) must have been involved. He was appointed in 1828 for a year to train in botany and natural history and to assist Reinwardt in arranging and maintaining the Academy herbarium (Karstens 1983: 4).

#### ***The arrival of the Rijksherbarium in Leiden***

In 1829 the Rijksherbarium was founded in Brussels, the then capital of The Netherlands, as a repository for all the herbaria assembled by explorers funded by the government. As a consequence of the uprising in 1830 that resulted in the separation of the Southern Netherlands (now Belgium), the collections of the Rijksherbarium were in danger of being destroyed. Therefore, they were transferred to Leiden and temporarily housed in the building in the Leiden botanical garden that already held the Academy herbarium. At that time, the collections of the

Rijksherbarium consisted of Carl Ludwig Blume's specimens from Java, the Japanese plants collected by Philipp Franz von Siebold (1796–1866) and the herbarium of the South African mycologist and botanist Christiaan Hendrik Persoon (1761–1836). Soon after the transfer from Brussels to Leiden it was decided to add the collections of Leiden University to those of the Rijksherbarium (Van Steenis-Kruseman 1979: 29).

According to the German amateur botanist and horticulturist, Franz Ludwig von Welden (1782–1853), who visited the Leiden botanical garden in 1835, the herbarium of Boerhaave, Van Royen and Persoon had been combined with later acquired herbaria (Von Welden 1835: 683–688). This may have been effected by Jacques Pierot (1812–1841), who was Blume's assistant at the Rijksherbarium from 1831 until September 1840 (Van Steenis 1989: 17), but who had worked in the Academy herbarium before that (Kalkman & Smit 1979: 126). He is the one who made the annotation 'Hb. v. Royen' or 'Hb. Meerb.' on many labels and sheets. Probably to save paper, more than one gathering of the same species was often mounted on a single sheet. In the process sometimes not only Van Royen, but also Meerburg, Gatterer or Persoon specimens have been mounted on a single sheet, while it was obviously impossible to attach the labels to the plants to which they belonged.

#### ***The move to Rapenburg 33***

By Royal Decree of 9 December 1830 the Rijksherbarium and the Academy herbarium became officially one. In April 1833, Blume complained that the herbarium building in the Leiden botanical garden looked more like a store house than a scientific institute. He felt ashamed to receive Dutch and foreign scholars there and pressed for a better accommodation, but his request was not granted (Karstens 1983). After Blume had repeatedly pointed out the poor condition of the building and

<sup>6</sup> Supplement Nederlandsche Staats-Courant (27 July 1825).





**Fig. 6** Collection management staff at work in a back room of the Rijksherbarium at Rapenburg 33. Photograph c. 1912 (Naturalis archives).

the herbarium itself, he placed (probably his own) collections in a few back rooms of a house at Rapenburg 33, Leiden in 1834. This house, which was already partly in use for the collection of 'pleisterbeelden' (plaster cast sculptures) of Leiden University, was assigned to him by the supervisor of the university buildings (Karstens 1983).

In the second half of 1837 and the first half of 1838, Rapenburg 33 was converted to house the herbarium collections (Karstens 1983) (Fig. 5). The transfer of the Academy herbarium thither was officially supposed to have been completed in 1838 (Van Steenis-Kruseman 1979: 30). According to Reinwardt there were no longer any herbarium specimens in the Leiden botanical garden in 1842, because they had been combined with the collections of the Rijksherbarium (Karstens 1983: 7).

When Friedrich Anton Wilhelm Miquel (1811–1871) succeeded Blume in 1862, he wrote that he had found the collections of the Rijksherbarium in chaos, a verdict that was strongly contradicted by the curator Herman van Hall (1830–1890) in a public letter to the minister of the interior, Johan Rudolf Thorbecke (Van Hall 1862: 8–9).<sup>7</sup> In 1874, Miquel's successor, Willem Frederik Reinier Suringar (1832–1898), reported on the many shortcomings of the Rapenburg building and the poor state of the collections, which was a consequence of poor storage conditions and staff shortages (Goddijn 1931: 17, Van Steenis-Kruseman 1979: 42). In letters and annual reports, Suringar continued to urge for improvements (Goddijn 1931: 19).

In 1899, together with the 'Rijksbouwmeester' (Government architect), Jacobus Marinus Janse (1860–1938), who was not

only the director of the Leiden botanical laboratory but also of the Rijksherbarium, was given the task of designing new accommodation for both entities in the Nonnensteeg (Janse 1908: 7, 14). With a view to an imminent move to a new building, it was decided to unite all herbaria in one general herbarium (Fig. 6).

However, at the end of the 19th century, the collections of the Rijksherbarium still consisted of several separate herbaria. There were special collections of plants from Japan and the East Indies, while the Academy herbarium was also kept apart. The specimens were stored in portfolios that were placed on shelves in simple cabinets with glass doors, and on top and behind the cabinets. A significant proportion of the specimens lay together unmounted in folders of grey paper or other wrappers, as a result of which loss and mixing up of labels could easily occur. The first concern was therefore to mount all loose plants on firm and wood-free paper of uniform size (30 by 50 cm). Plants that were already mounted on sheets of varying size were glued in their entirety to the new sheets (Goddijn 1931: 17, Goethart 1931: 47, 49–50) (Fig. 7, 8). From then on, the herbarium specimens were no longer kept in portfolios but in specially designed boxes in which they were systematically organised (Goethart 1931: 52).

#### Later moves

The part of the new building in the Nonnensteeg destined for the botanical laboratory was completed in 1908 (Fig. 9). The part intended for the Rijksherbarium was finished between 1911 and 1914 and in this period the collections were moved to the new facilities (Van Steenis-Kruseman 1979: 31), virtually where the residence of the professor of botany formerly stood. In 1964 the collections were moved again, this time to a renovated factory complex at Schelpenkade 6, Leiden (Van Steenis-Kruseman

<sup>7</sup> Bijblad Staatscourant; Redevoeringen uitgesproken door den heer Thorbecke, Minister van Binnenlandsche Zaken, in de zitting van den 25sten November 1862 (Speeches delivered by Mr. Thorbecke, Minister of Home Affairs, at the session of 25 November 1862).



**Fig. 7** Example of a sheet (L 0142838) on which several collections of *Veronica fruticulosa* L. (*Plantaginaceae*) are mounted. There are labels written by David van Royen, Nicolaus Joseph von Jacquin, Nicolaas Meerburg, Peter Jonas Bergius and others. The four digits of the number on the label Herb. Lugd. Bat. N° 913.3-227 in the upper right corner indicate that the mounting was done on the third day of 1913 when the herbarium was housed at Rapenburg 33. Until then these collections were filed together unmounted in a single folder, with the result that at the time of mounting in 1913 it was no longer possible to determine which label belonged to which specimen.



**Fig. 8** Six different collections of *Arenaria grandiflora* L. (L 0223216/L 0223217; *Caryophyllaceae*). The mounting on the smaller sheet was done when the 'Van Royen herbarium' was still at the Leiden botanical garden. The label Herb. Lugd. Bat. N° 899.136-413 in the lower left corner and not top right, where these labels are usually placed, indicates that this small sheet was glued in its entirety to the larger sheet on day 136 of 1899.

## COMPOSITION OF THE 'VAN ROYEN HERBARIUM'

The discovery in the National Library of The Netherlands in The Hague (Verz. Cat. 36011) of a copy of the sales catalogue of David van Royen's library (Anonymous 1800), in which the 'Van Royen herbarium' is described in considerable detail, has made it possible to get an idea as to how it was arranged at the time of the auction, and what specimens had been accumulated by Adriaan and David. Their herbarium comprised seven different sub-collections, each of which was auctioned as a separate lot. The original Latin catalogue description with an English translation follows below.

Lot 1 – 'Hortus siccus, sive Collectio eximia Plantarum tam exoticarum, quam inprimis Europæarum, optime siccatarum, adjectis maximam partem nominibus generum & specierum Linnæanus. Ingens specierum in hoc Herbario occurrentium numerus vetuit species omnes enumerare; sufficet notasse Clar. Defunctum per quadraginta & quod excurrit annos non tantum omnem curam posuisse, ut hanc collectionem amplificaret; verum etiam præstantissimos Europæ Botanicos, quibuscum litterarum commercio

1799: 31). In 1986 the phanerogam collections were moved from Schelpenkade to Rapenburg 70–74, a building formerly housing the university library. The cryptogams stayed behind in Schelpenkade until in 1995 all collections were re-united in the 'Van Steenis-building' at Einsteinweg, Leiden, a building that had originally been built for the 'Infotheek' computer hardware company.

In 1999 the Rijksherbarium became part of the National Herbarium of The Netherlands which in turn became part of Naturalis in 2010. While waiting for a newly built museum, parts of the herbaria at Utrecht (U) and Leiden (L), including the historical collections, were moved to a building in a business park in Leiden (Nieuwenhuizenweg) and another part, the Wageningen herbarium (WAG) was stored in a warehouse in another business park in Zoeterwoude (Industrieweg) in 2013. The new Naturalis building was completed in 2019, after which all herbarium collections that were stored at the different locations were moved to the new collection depots.





**Fig. 9** View of the buildings of the Rijksherbarium (left) and Botanical Laboratory (right) in the Nonnensteeg, seen from the Leiden botanical garden. Black and white photograph 1949 A. van Vliet (Erfgoed Leiden en Omstreken, PV104141).

jungebatur, eo operam contulisse, communicatis speciminibus duplicatis, unde haec collectio ita mole excrevit, ut 961 plagulis, vulgo Cahiers, debuerit contineri.

Accedunt aliquot Plantarum centenae, inprimis Europaea, maximam partem nominibus designatae, quae serici systematicae nondum sunt insertae.

Haec omnia collocatae sunt Armario abietino, diviso in 70 loculamenta'.

Lot 2 – 'Plantae exoticae, ex Ceilona, Java, Capite B. Spei aliisque indiae inprimis regionibus missae, quibus praeter nomina indigena Cl. Defunctus passim nomina Linnaeana adscripsit – Continetur hic vegetabilis thesaurus, in quo procul dubio multae, nondum descriptae, nec definitae species latent, 680 ferme plagulis repositis magno in armario ex ligno abietino, diviso in 65 loculamenta'.

Lot 3 – 'Hortus siccus locupletissimus, quem collegit Cl. Adr. Van Royen, continens plerasque Plantas, quas in Prodomo Horti Lugd. Bat. Notavit, ad cujus normam hic thesaurus 900 plagulis comprehensus dispositus est in Armario loculis diviso ex ligno abietino'.

Lot 4 – 'Plantae circiter 82, quibus nomina Systematica Latina manu Pauli Hermanni inscripta sunt'.

Lot 5 – '335 plantae siccatae ex Ceylona a Koenigio, qui ipse nomina Linnaeana adscripsit, missae, & egregie conservatae'.

Lot 6 – '200 et aliquot Plantarum Japonicarum Species, lectae a Thunbergio, qui & ipse pleraque nomina adjecit'.

Lot 7 – '19 fasciculi aliquot centenas Plantas continentes, quae circa Leydam & in Horto Botanico Lugduno-Batavo lectae sunt'.

*Translation.* 'Lot 1 – Herbarium, or an outstanding collection of very well dried exotic plants, particularly those of Europe, for the most part with the Linnaean genus and species names added.

The vast number of species present in this herbarium forbids listing all species; it will be sufficient to note that not only the Most Distinguished deceased has enlarged the collection for over 40 years, but also that the most excellent botanists of Europe, with whom he corresponded, contributed by sharing duplicate specimens, so much to the work whereby this collection has grown so much in size, that they had to be stored in 961 'plagulis', commonly called 'cahiers'. In addition there are several hundred plants, mainly European, most of them identified, which have not yet been inserted in the systematic system. These are all placed in a cabinet of fir wood, divided into 70 compartments.

Lot 2 – Exotic plants sent from Sri Lanka, Java, Cape of Good Hope, and other regions of India, in addition to the indigenous names the Most Distinguished deceased sometimes added the Linnaean names – this botanical collection, in which without doubt are hidden many not yet described, or well-defined species, about 680 'plagulis' stored in a large cabinet of fir wood, subdivided into 65 compartments.

Lot 3 – A very rich herbarium, which the Most Distinguished Adriaan van Royen collected, containing a great many plants, which he listed in Prodomus Horti Lugd. Bat., in accordance with which the present collection, containing 900 'plagulis', is arranged in a cabinet of fir wood subdivided into compartments.

Lot 4 – Around 82 plants to which Paul Herman has added the Latin systematic names.

Lot 5 – 335 very well preserved dried plants sent from Sri Lanka by König [the Baltic-German physician Johann Gerhard König (1728–1785)], who himself added the Linnaean names.

Lot 6 – More than 200 species of Japanese plants, collected by Thunberg, who added many names himself.

Lot 7 – 19 fascicles containing several hundred plants, which were collected around Leiden and in the Leiden botanical garden.'

Besides herbarium specimens, a collection of botanical specimens in spirit (lots 48–70), each consisting of one plant specimen was sold. The only survivor of that collection may be the single seed of the nutmeg tree *Myristica fragrans* Houtt.; L 0368009; *Myristicaceae*) in a (not original) glass jar.

### Arrangement and storage method

At the time the 'Van Royen herbarium' was auctioned in 1800, the three largest sub-collections, i.e., the one with plants 'particularly those of Europe' (Lot 1), the one with exotic specimens (Lot 2) and the herbarium containing a great many of the plants that had flowered in the Leiden botanical garden (Lot 3) were each stored in a separate cabinet made of softwood. Whether this was already the case when Adriaan van Royen was in possession of it is unknown. The specimens in Lot 1 and Lot 2 were arranged by Adriaan according to Boerhaave's *Index Alter* (1720). The garden plants in Lot 3 were arranged following Adriaan's *Florae Leydensis Prodrum* (1740). After David van Royen came into possession of the herbarium, he updated the nomenclature to follow that of the second edition of Linnaeus's *Species Plantarum* (1762–1763).

Other Dutch herbaria that were established in the 18th century were also housed in wooden cabinets at the time they were sold. Meerburg's herbarium, which was offered for sale in 1816, was stored in a cabinet with green gauze mesh doors. Considering the choice of materials – softwood, and meshed doors – the cabinets of Van Royen and Meerburg were not made as show-pieces. Nor were the two cabinets containing the herbarium of J.F. Gronovius and his son Laurens Theodorus Gronovius (1730–1777), as these were made of oak which had been

finished to resemble cedar wood. The doors of Gronovius's cabinets were fitted with green gauze (Meuschen 1778: 143–144), as was the case with Meerburg's cabinet. The oak herbarium cabinet in the Louis XIV style of the Utrecht professors of botany, Steven Jan van Geuns (1767–1795) and his father Matthias van Geuns (1735–1817), on the other hand was richly ornamented. Their herbarium, including its cabinet, was bought by Utrecht University in 1816. With the transfer of the herbarium collections of Utrecht University (U) in 2009 the Van Geuns specimens were incorporated in the general herbarium and came to L. The cabinet was transferred to the Utrecht University Museum. The herbarium of the banker and amateur naturalist George Clifford (1685–1760) was also sold together with its cabinet (Thijssse 2018: 139). What Clifford's herbarium cabinet looked like is unknown.

For centuries herbarium sheets were bound into books: even in the 18th century and later, this was still common. The innovation of making loose-leafed herbarium collections is attributed to Linnaeus (Müller-Wille 2006: 61). In his *Systema Naturae* (Linnaeus 1735) he divided the plant kingdom into different classes and orders on the basis of the numbers of stamens and styles. To be able to organise the specimens according to Linnaeus's system and to add new collections in a simple way, the best solution was to store them mounted on loose sheets. To include also the older specimens in book herbaria, it was necessary to take the books apart. This is exactly what David van Royen did with a book herbarium previously owned by Jacob Breyne, which he had found among Adriaan van Royen's collections (Fig. 10).

### Printed herbarium ornaments

Conspicuous features of the 'Van Royen herbarium' are the printed paper vases and ribbons that were often used to accompany the mounted plants. For this purpose, prints with a variety of ornaments were produced (Thijssse 2018: 140–144). The practice of decorating herbaria with such ornaments was not unusual in The Netherlands in the period 1720–1750 (Thijssse 2018: 140). Vases and decorative labels were also used in their herbaria by the Amsterdam professors of botany, Johannes and Nicolaas Laurens Burman (1734–1793), the Harderwijk professor of botany, David de Gorter (1717–1783), J.F. Gronovius, the Amsterdam physician Martinus Houttuyn



**Fig. 10** Specimens of *Plantago subulata* L. (L 0144230; *Plantaginaceae*) and *Veronica fruticulosa* L. (L 0365009; *Plantaginaceae*) that have been cut from a book herbarium that was owned by Jacob Breyne. According to the text added by David van Royen this herbarium belonged to Adriaan van Royen and the plants in it were collected by Carolus Schweiker in the Montpellier area (France) in 1676.



(1720–1798) and Clifford. This use was not limited to The Netherlands, as there are also examples of German herbaria (Mansfeld 1936: 307, Gunia 1995) and a Swedish herbarium (Juel 1926: 65) in which such ornaments were used.

## THE SPECIMENS IN LOTS 1 AND 2

As is evident from the auction catalogue, the specimens in the 'Van Royen herbarium' came from many, diverse sources. Determining these sources can be extremely complex and difficult, and due to the chequered curatorial history of the herbarium, sometimes impossible. An obvious and major source of specimens was, of course, the Leiden botanical garden itself. Herbarium material could be collected from the plants in the garden and also from those grown from seeds received from correspondents. Every year 2000–3000 seed samples reached the Leiden botanical garden (Molhuysen 1921, Vol. 5: 35), and were sown in seedbeds devoted to this purpose (Fig. 3).

From their large network of correspondents (see below) the Van Royens received not only seeds and other living botanical material, but also herbarium specimens. Visitors and students brought herbarium specimens as gifts; sometimes herbarium material was bought at auctions. Interesting plants for the Leiden botanical garden were also supplied by nurseries in The Netherlands and abroad. Depending on their native country the specimens were inserted in the appropriate herbarium cabinet, as described in the sale catalogue of the 'Van Royen herbarium' (Anonymous 1800). Below, we survey these different sources as far as is currently possible.

Besides specimens from Adriaan and David van Royen's time, the 'Van Royen herbarium' also contains earlier collections from their predecessor Hermann and there are also mosses attributed to Samuel Doody (1656–1706), the apothecary and manager of the Chelsea Physic Garden and the foremost bryologist of his time (Dandy 1958: 126). How Adriaan came to own a herbarium from Jacob Breyne is not known, although he did

correspond with Breyne's son Johann Philipp (Jacobs & Ukert 1843: 356). These Jacob Breyne specimens are mounted on coarse paper and have small labels written by J. Breyne, but were collected by his fellow townsman Carolus Schweiker (or Sweiker; ?–?) in the fields around Montpellier (France) in 1676 (Breyne 1678: 73, De Jong et al. 2022) (Fig. 10). They probably represent the specimens in the parcel of plants from the elder Breyne, which J.A. Schultes refers to in his report of his visit to the Leiden botanical garden in 1824 (Schultes 1824: 724).

## Correspondents who contributed to the 'Van Royen herbarium'

Obtaining interesting species for the garden through correspondence with colleagues and botanists in The Netherlands and abroad was an essential task of the Leiden professors of botany. According to J.F. Gronovius, Adriaan van Royen did not have an extensive correspondence in order to get new plants (Smith 1821, Vol. 2: 173). In reality, as evidenced by preserved letters and the fact that some labels in his herbarium state from whom the plant, seed or bulb was received, Adriaan may not have had a very wide circle of correspondents, but he did have a number of important contacts with leading botanists in Western European countries and Russia.

In a letter of 17 March 1735 to Lorenz Heister (1683–1758), professor of anatomy and surgery in Helmstadt (Bavaria) (Staffleu & Cowan 1979, Vol. 2: 141), Adriaan van Royen enclosed a list of 'desiderata'. The names of the plants he wanted to receive he had taken from Heister's catalogue of 1731 (Heister 1731). Because living plants would not survive a lengthy journey, it was mainly seeds, bulbs and rhizomes of the requested species that were exchanged. It goes without saying that once successfully cultivated in the Leiden botanical garden, material could be collected to be pressed and dried to enrich the herbarium. Examples are the specimens that have labels with a serial number followed by two digits on the label. The latter stand for the year in which the seeds were sown (Fig. 11).



**Fig. 11** Labels from herbarium specimens made from plants that were raised from seeds in the Leiden botanical garden. The first number on the label is a serial number and is followed by the last two digits of the year in which the seed was received/sown: 531/38 *Vicia bithynica* (L.) L. (L 0140072; *Fabaceae*), 906/40 *Bromus hordeaceus* L. (L 0052657; *Poaceae*) and 462/35 and 551/35 *Corispermum hyssopifolium* L. (L 0140072; *Amaranthaceae*).

In one of his letters (24 February 1738) to Johannes Gessner (1709–1790), Adriaan van Royen specifically asked for alpine plants for the Leiden botanical garden (Boscani Leoni 2017: 72). In the same year he asked Linnaeus for plants from Clifford's garden.<sup>8</sup> In the wish list ('Desiderantur ex Horto Cliffortiano in usum Horti Academici Lugd(uni) B(ata)va') he included 50 species. His request was successful, because in a following letter he asked Linnaeus to thank Clifford for the plants he had received.<sup>9</sup>

A wish-list for the years 1754–1755 ('Desiderantur in usum horti Academici Lugduni Batavi Ao 1754–1755') drawn up by David van Royen is in the archives of Naturalis. In his letter of 7 June 1763, David asked Linnaeus to send him seeds and herbarium specimens of rare species that grew (wild) in Sweden or in his garden in exchange for what he had sent him.<sup>10</sup> David also exchanged many seeds with Casimiro Gómez-de Ortega (1740–1818), the director of the botanical garden in Madrid. David mainly sent seeds from Cape and Sri Lankan plants.<sup>11</sup> Added to David's letter of 18 February 1786 now in Madrid (Sign. AJB, Div. I, 20, 5, 31) is a list with the names (of the seeds) that Gómez-de Ortega sent to Leiden on 10 April 1787.

Of the seeds and plants that the professors of botany received through their correspondents, either by purchase, exchange or otherwise, they were obliged to keep a register (Molhuysen 1920, Vol. 4: 28). Some of these seed books of Adriaan van Royen's predecessor Boerhaave have been preserved (Wesseling 2019), while those of the Van Royens themselves unfortunately have not.

In the sale catalogue of the 'Van Royen herbarium' it is explicitly mentioned that David van Royen corresponded with many of the most prominent botanists of Europe, who contributed many of their duplicates to his herbarium.

The names of those correspondents who contributed to the 'Van Royen herbarium', either through living material such as seeds or by sending herbarium material, are listed below. Not mentioned are those correspondents who do not seem to have sent botanical material to the Van Royens. The number of specimens found so far in the 'Van Royen herbarium' by the correspondent in question is shown in round parentheses. Examples of their specimens and, when 'recognised' one or more examples of their handwriting are given in Appendix 3.

### Adriaan van Royen's correspondents

#### Austria

- Jean Baptiste Bassand (1680–1742) (two specimens) – French physician in Vienna (Veendorp & Baas Becking 1938: 106).

#### England

- Philip Miller (1691–1771) (14 specimens) — Superintendent of the Chelsea Physic Garden (Veendorp & Baas Becking 1938: 110, Stafleu & Cowan 1981, Vol. 3: 491). Miller visited the Leiden botanical garden in 1727 (Miller 1735). Presumably on behalf of Boerhaave, Adriaan van Royen sent Miller rare plants from the Leiden botanical garden (Veendorp & Baas Becking 1938: 110).
- Isaac Rand (1674–1743) (one specimen) — Director of the Chelsea Physic garden (1724–1743) (Stafleu & Cowan

1983, Vol. 4: 576). Correspondent of Boerhaave (Veendorp & Baas Becking 1938: 109, Wesseling 2019: 241).

- Richard Richardson (1663–1741) (one specimen) — Physician and botanist in Brierley (South Yorkshire, England) where he lived in Brierley Hall which had its own botanical garden. Richardson matriculated at Leiden University on 26 September 1687, and lodged for three years with Hermann (Dandy 1958: 194).
- James Sherard (1666–1737) (four specimens) — Apothecary, brother of the great botanist William Sherard (1659–1728). Owner of a country house and a garden with many exotic plants in Eltham (Kent) of which a catalogue (*Hortus Elthamensis*) was published by Johann Jacob Dillenius (1684–1747) in 1732.

#### France

- Charles François de Cisternay du Fay (1698–1739) (ten specimens) — Supervisor of the Jardin du Roi (now Jardin des Plantes, Paris). In 1735 and 1736 Cisternay du Fay sent seeds of Egyptian plants.<sup>12</sup>
- Antoine de Jussieu (1686–1758) and his brother Bernard de Jussieu (1699–1777) (Only five specimens of the ones ascribed to Antoine or Bernard in the Naturalis database (<https://biportal.naturalis.nl/>) were sent by one of them) — Antoine was appointed professor of botany at the Jardin du Roi in Paris in 1710. In 1722 Bernard became assistant demonstrator of plants there. He kept this post for the rest of his life. In 1759 Bernard was asked to develop a botanical garden at the Petit Trianon (Versailles). One letter of A. van Royen (10 September 1752) to B. de Jussieu is in the archives of Naturalis.
- Claude Richard (1705–1784) (one specimen) — Head gardener at the Trianon garden (Versailles) (Duris 1993: 61–62).

#### Germany

- Johann Bartholomeus Adam Beringer (1670–1738) (three specimens) — Professor of medicine 1695–1740. In 1695 he was commissioned to bring herbs and trees from The Netherlands to rearrange the Würzburg botanical garden (Buchner 1932: 483).
- Johann Ernst Hebenstreit (1703–1757) (two specimens) — Anatomist and explorer. Professor at Leipzig in 1729. He travelled in North Africa (1731–1735).
- Lorenz Heister (one specimen) — After David van Royen had become professor of botany, he continued the correspondence with Heister.<sup>13</sup>
- Albrecht von Haller (c. 250 specimens) — Swiss physician and naturalist, practising in Göttingen (Germany), 1736–1753. Author of *Enumeratio Methodica Stirpium Helvetiae Indigenarum* (1742). In 1738 he sent Adriaan van Royen a collection of more than 100 mosses.<sup>14</sup> In his letter (3 March 1739) Adriaan asked for seeds of plants from the Harz Mountains (Germany) and the Rhaetian Alps (Suringar 1866: 262). In return, Adriaan sent a considerable number of materials from the Leiden garden to Von Haller and was one of the main suppliers of new species for Von Haller's garden (Gradstein & Schwerdtfeger 2009: 14–16).

#### Italy

- Giuseppe Monti (1682–1760) (two specimens) — Professor of botany and head of the botanical garden in Bologna (Veendorp & Baas Becking 1938: 109).

<sup>8</sup> Letter A. van Royen (28 March 1738) to Linnaeus (Linnaean correspondence L0245).

<sup>9</sup> Letter A. van Royen (12 April 1738) to Linnaeus (Linnaean correspondence L0248).

<sup>10</sup> Letter D. van Royen (7 June 1763) to Linnaeus (Linnaean correspondence L3269).

<sup>11</sup> Four letters by D. van Royen to C. Gómez-de Ortega, written in 1784–1787, are in the Real Jardín Botánico in Madrid (Sign. AJB, Div. I, 20, 5, 29; Sign. AJB, Div. I, 20, 5, 30; Sign. AJB, Div. I, 20, 5, 31; Sign. AJB, Div. I, 20, 5, 32).

<sup>12</sup> Note in collection management archives of Naturalis.

<sup>13</sup> <https://www.bavarikon.de/search?lang=de&terms=royen> (last accessed 12 November 2022).

<sup>14</sup> Letter A. von Haller (24 November 1738) to Linnaeus (Linnaean correspondence L0261).



- Giulio Pontedera (1688–1757) (four specimens) — Professor of botany and head of the botanical garden of the university of Padua (Chmielewski 2011: 98).
- Russia
- Traugott Gerber (1710–1743) (three specimens) — German physician and botanist who, shortly after he had obtained his MD, was called to Moscow by Tsarina Anna Ivanovna (1693–1740) to lay out a medicinal garden and teach the use of herbs. In 1739 and 1741 he led botanical expeditions in Russia. When in 1742 his position at the medicinal garden was discontinued, Gerber went to Finland as a physician in the Russian army.<sup>15</sup> Six letters of A. van Royen to T. Gerber are in the Waller Manuscript Collection, Uppsala University Library (Ms benl-00618-00623).
  - Johann Gottfried Heinzelman (fl. 1731–1737) (one specimen) — German physician. Travelled on a botanical journey with Gerber to the Volga and Don rivers around 1732.<sup>16</sup>
  - Gottlob Schober (1670–1739) (one specimen) — Graduate of Utrecht University. Schober lived in Moscow from 1715 until his death. In 1717–1720 he visited the Lower Volga Region as well as the northern and northwestern shores of the Caspian Sea (Sokoloff et al. 2002: 133). One of his letters (Moscow, 31 August 1731) to A. van Royen is in the Waller Manuscript Collection, Uppsala University Library (Ms benl-00617).
- Spain
- Rouveroiij (?–?) (two specimens) — Corresponded also with Boerhaave (Wesseling 2019: 241), but nothing else is known about him.
- Sweden
- Eric Gustaf Lidbeck (1724–1803) (one specimen) — Curator of the botanical garden in Lund (Stafleu & Cowan 1981, Vol. 3: 10). Lidbeck met Adriaan van Royen in Leiden when he visited The Netherlands in 1752.<sup>17</sup> Three letters of A. van Royen (1753–1755) are in Lidbeck's correspondence.<sup>18</sup>
  - Carl Linnaeus (1707–1778) (three specimens) — In Linnaeus's correspondence there is one letter of Linnaeus to A. van Royen and 25 letters by A. van Royen to Linnaeus, all written between 1737 and 1753 (<https://www.alvin-portal.org/>, last accessed 24 April 2022).
- Switzerland
- Johannes Gessner (three specimens) — Corresponded with A. van Royen (Boscani Leoni 2017: 72) and also with J.F. Gronovius (Boschung 1996: 76).
- The Netherlands
- Herman Boerhaave (c. 90 specimens; see Offerhaus et al. 2022) — Adriaan van Royen's teacher and predecessor.
  - Johannes Burman — Professor of botany in Amsterdam from 1731. Johannes obtained his doctorate on 12 March 1728. In honour of this occasion A. van Royen wrote a Latin verse for his friend that was added to Burman's dissertation (Burman 1728). Johannes did the same for Adriaan who promoted on 23 March and his verse is printed in Adriaan's dissertation (A. van Royen 1728). Despite their friendship, the number of herbarium specimens that Johannes sent directly to Adriaan seems very small. By far the majority of the specimens attributed to Burman in the IDC guide (Thijssse 1998–2002, Thijssse & Veldkamp 2003) are probably specimens from the herbarium of Albinus (see Appendix 3).<sup>19</sup> Several letters of A. van Royen to J. Burman are in the Leiden University Library (Special collections, BPL 885).
  - Johannes de Gorter (1689–1762) (one specimen) — Professor of medicine at Harderwijk University. Promotor at Linnaeus's doctorate in Harderwijk.
  - Johan Frederik Gronovius — Author of *Flora Virginica*. Adriaan van Royen undoubtedly received herbarium specimens directly from Gronovius. However, identifying particular Gronovius' specimens as belonging to one of the Van Royens is problematic, because Meerburg also had a set of Gronovius material (see *Handwritings* below).

### David van Royen's European correspondents

#### Austria

- Nicolaus Joseph von Jacquin (1727–1817) (11 specimens) — He sent a parcel of dried plants to David van Royen. On the sheet of *Valeriana celtica* L. (L 0100990; *Caprifoliaceae*) the original cut-out address has been pasted. David is mentioned as 'Universitatis patriae rectori'. Since David held the position of rector only once, in 1763/1764, Jacquin must have sent him these plants in that time. In 1763, Jacquin was professor of chemistry and mineralogy at Schemnitz (now Banská Štiavnica, Slovakia).<sup>20</sup> One letter of D. van Royen (19 January 1762 or 1764) to Von Jacquin is in the Waller Manuscript Collection, Uppsala University Library (Ms benl-00595). Other letters are in the Naturhistorischen Museum, Wien and in the Österreichische Nationalbibliothek (Ladurner 2016).

#### Denmark/Norway

- Martin Vahl (1749–1804) (two specimens) — Danish-Norwegian botanist who travelled in Europe 1783–1785 (Stafleu & Cowan 1986, Vol. 6: 629).

#### England

- Joseph Banks (1743–1820) (ten fern specimens) — The explorer and botanist Banks met David van Royen in Leiden in 1773 (Schilling 2015: 114).
- John Ellis (1710?–1776) (two specimens) — Irish-born merchant in London, agent for West Florida 1764, for Dominica 1770. Ellis imported many American seeds (Stafleu & Cowan 2000, Suppl. VI: 313).
- Philip Miller (four specimens) — Corresponded also with A. van Royen (see the correspondents of A. van Royen).
- Humphry Waldo Sibthorp (1713–1797) (one specimen) — Sherardian professor of botany at Oxford (Stafleu & Cowan 1985, Vol. 5: 577). Letters of H.W. Sibthorp to D. van Royen are in the Leiden University library (Special collections BPL 1886 and BPL 1900).

#### France

- Louis-Guillaume LeMonnier (1717–1799) (11 specimens) — Professor at the Jardin du Roi, Paris (1758–1786) (Stafleu & Cowan 1979, Vol. 2: 842).

<sup>19</sup> The majority of the Burman specimens encountered in the general herbarium of the Rijksherbarium are duplicates from the Burman herbarium and were never part of the 'Van Royen herbarium'. The often scrappy specimens in general lack their original labels; the only information provided on the sheet was written by C.L. Blume. Such specimens are included in the general historical herbarium collection of Naturalis.

After the death of Burman's son, Nicolaas Laurens, Nicolaas's herbarium, including the specimens of his father (c. 29000), was sold to the banker and naturalist Benjamin Delessert (1773–1844). It appears that when Blume visited Paris in 1830 (Den Ouden 1979: 133), he was given permission by Delessert to select duplicates for the Rijksherbarium. On that occasion, Blume seems to have taken an unknown number of specimens from Burman's herbarium, including specimens from Houttuyn. When Lasègue (1845: 347) wrote that part of Burman's herbarium was in the Leiden Rijksherbarium, he was probably referring to these duplicates. Moreover, it is known that Delessert was prepared to exchange plants with the Leiden Academy herbarium (Karstens 1983: 9).

<sup>20</sup> [https://en.wikipedia.org/wiki/Mining\\_Academy\\_\(Bansk%C3%A1\\_%C5%A0tiavnica\)](https://en.wikipedia.org/wiki/Mining_Academy_(Bansk%C3%A1_%C5%A0tiavnica)).

<sup>15</sup> <https://www.gerbera.org/traugott-gerber/> (last accessed 24 April 2022).

<sup>16</sup> <https://plants.jstor.org/> (last accessed 24 April 2022).

<sup>17</sup> Letter by E.G. Lidbeck (19 August 1752) to Linnaeus (Linnaean correspondence L1463).

<sup>18</sup> <https://www.alvin-portal.org/> (last accessed 24 April 2022).

- Jacob Reinhold Spielmann (1722–1783) (31 specimens) — Professor of botany and medicine in Strasbourg (Fries 1909: 252).
- Germany
- Johann Friedrich Gmelin (1748–1804) (eight specimens) — Professor of medicine and chemistry in Tübingen, later in Göttingen (Stafleu & Cowan 1976, Vol. 1: 955). Gmelin matriculated at Leiden University in 1769 (Du Rieu 1875: 1097). Author of *Enumeratio stirpium agro Tubingensi indigenarum* (Gmelin 1772).
  - Lorenz Heister — After Adriaan van Royen had resigned as professor of botany, David continued the correspondence with Heister.<sup>21</sup>
- Italy
- Carlo Allioni (1728–1804) (nine specimens) — Professor of botany at the medical faculty of the Turin Athenaeum (Stafleu & Cowan 1992, Suppl. I: 76). Correspondent of David van Royen (Luciano 2013: 420).
  - Gabriele Brunelli (1728–1797) (two specimens) — Professor of botany, head of the Bologna botanical garden.
  - Vitaliano Donati (1717–1762) (two specimens) — Venetian biologist and apothecary (Stafleu & Cowan 1976, Vol. 1: 670) in Turin.
  - Giovanni Marsili (1727–1794) (eight specimens) — Professor of botany and curator of the Padua botanical garden (Stafleu & Cowan 1981, Vol. 3: 311). He visited David van Royen in Leiden, probably in 1758.<sup>22</sup>
  - Giuseppe Monti (1682–1760) (three specimens) — See A. van Royen's correspondents. After Adriaan van Royen had resigned as professor of botany, David continued the correspondence with Monti.
  - Angelo Attilio Tilli (1710–1781) (two specimens) — Professor of botany in Pisa.
- Spain
- Casimiro Gómez-de Ortega (1740–1818) (12 specimens) — Director of the botanical garden in Madrid (Stafleu & Cowan 1981, Vol. 3: 847). Four letters by D. van Royen to C. Gómez-de Ortega, written in 1784–1787, are in the Real Jardín Botánico in Madrid (Sign. AJB, Div. I, 20, 5, 29; Sign. AJB, Div. I, 20, 5, 30; Sign. AJB, Div. I, 20, 5, 31; AJB, Div. I, 20, 5, 32).
- Sweden
- Peter Jonas Bergius (1730–1790) (50 specimens) — Professor of natural history and medicine at the collegium medicum in Stockholm (Stafleu & Cowan 1976, Vol. 1: 190).
  - Engelbert Gother (1708–1775) (81 specimens) — Stockholm 'handelsborgmästare' ('mayor of commerce') and one of the directors of the Rörstrand porcelain factory (Fries 1908: 243). In 1764 he sent an unknown number of Swedish plants to David van Royen. See *Fontinalis antipyretica* Hedw. (L 0423523) 'Inventa a Engelb: Gothero Upsaliae, qui Eam Ao 1764 Davidi van Royen in Hollandiam misit una cum aliis plantis Suesicis'.<sup>23</sup>
  - Eric Gustaf Lidbeck (1724–1803) (one specimen) — See Adriaan van Royen's Swedish correspondents. Five letters by D. van Royen are in Lidbeck's correspondence.
- Switzerland
- Horace-Benedict de Saussure (1740–1799) (three specimens) — Naturalist and professor of philosophy in Geneva.
- Travelled in France, The Netherlands, England, Sicily and the Alps (Stafleu & Cowan 1985, Vol. 5: 70).
- Johann Jakob Dick (1742–1775) (c. 20 specimens) — Clergyman and amateur botanist. Pupil of Von Haller and tutor of Von Haller's daughter. He collected specimens for him when Von Haller was writing his *Enumeratio Methodica Stirpium Helvetiae Indigenarum* (Von Haller 1742). Dick's herbarium was bought by Banks in 1775 and is now at BM (De Beer 1955: 325, 1958: 143). Letters of Dick to D. van Royen are in the Leiden University Library (Special collections BPL 1900).
  - (Johann Georg) Locher (1739–1787) (four specimens) — First director of the botanical garden in Wiedikon (Zürich). He studied in Leiden under Adriaan and David van Royen and graduated in 1761 (Rudio 1896: 207–208). A shipment of seeds from the botanical garden in Zurich which had been received from Berbice (Guyana) from one Wernkli was sent to David van Royen (Rudio 1896: 201).
- The Netherlands
- Johannes Burman and N.L. Burman — In 1769, N.L. Burman became his father's assistant and he succeeded him in 1777. Specimens with labels stating that they originated from the Amsterdam Hortus, most probably ended up in the 'Van Royen herbarium' via Burman father and son.
  - David de Gorter (nine specimens) — Son of Johannes de Gorter. Author of *Flora Ingrica* (De Gorter 1761). In 1754 he went with his father to Russia to become the personal physician of Empress Elisabeth of Russia. He returned to The Netherlands in 1761 (Bouman 1847, Vol. 2: 240). In 1763 he went to Russia again, to return in 1764 (Bouman 1847, Vol. 2: 240).<sup>24</sup> Of the specimens recorded in the Naturalis database all but one bear the annotation 'D. de Gorter 1765', the year in which he gave a number of Russian plants to David van Royen.
- Not long after De Gorter's first arrival in Russia, Johann Jakob Lerche (1703–1780) gave him a collection of dried plants (De Gorter 1782: 206–207). Lerche was an army physician and botanist at St. Petersburg and travelled in Astrakhan where he collected many native plants. In a letter to Linnaeus (St. Petersburg, 16 July 1761) De Gorter wrote that he had saved the specimens Gerber had collected along the rivers Volga and Don and all specimens that Lerche had collected in Astrakhan (Russia) and provinces close to the Caspian Sea.<sup>25</sup> In 1762 De Gorter received a parcel containing dried plants from Astrakhan. This parcel included more than 20 species of 'Kali'.<sup>26</sup>
- Hieronymus David Gaubius (1705–1780) (one specimen) — Leiden professor of medicine and chemistry.
  - Johannes Frederik Gronovius and L.T. Gronovius — See Gronovius in correspondents of A. van Royen.
  - Martinus Houttuyn (two specimens) — Author of *Natuurlyke historie of uitvoerige beschryving der dieren, planten, en mineraalen* (Houttuyn 1761–1785), based largely on the principles of the 12th edition of Linnaeus's *Systema Naturae* (1766–1768). One letter of Houttuyn (23 December? 1773) to D. van Royen is in the Waller Manuscript Collection, Uppsala University Library (Ms benl-00410).
  - David Meese (1723–1770) (one specimen) — Gardener at the botanical garden of the University in Franeker (province of Friesland) (Stafleu & Cowan 1981, Vol. 3: 399) and author of *Flora Frisica* (Meese 1760).

<sup>21</sup> <https://www.bavarikon.de/search?lang=de&terms=royen> (last accessed 12 October 2022).

<sup>22</sup> Letter D. van Royen (3 March 1761) to Linnaeus (Linnaean correspondence L2891). Album amicorum J. le Francq van Berkheij. Vol. 1, fol. 8 r (National Library of The Netherlands, The Hague, KW 132 F 13/1).

<sup>23</sup> Letter D. van Royen (1 March 1767) to Linnaeus (Linnaean correspondence L3884).

<sup>24</sup> Letter N. Burman (23 October 1762) to Linnaeus (Linnaean correspondence L3139).

<sup>25</sup> Letter D. de Gorter (16 July 1761) to Linnaeus (Linnaean correspondence L2933).

<sup>26</sup> Letter D. de Gorter (Wijk bij Duurstede, 10 March 1762) to Linnaeus (Linnaean correspondence L3049).



- Eduard Sandifort (1742–1814) (four specimens) — Sandifort received his doctorate from Leiden University in 1763 and worked as a general practitioner in The Hague. In 1771, he became professor of anatomy and surgery at Leiden University. He gave D. van Royen some seaweed specimens that were probably collected by the German zoologist Peter Simon Pallas (1741–1811) who graduated in Leiden in 1759. Sandifort travelled in The Netherlands and to London but settled in The Hague. In 1767 he was invited by Catherine II of Russia to become professor at the St. Petersburg Academy of Sciences (Wendland 1992: 62). His son Gerard was acting director of the Leiden botanical garden from 1819 to 1823.
- Martin Wilhem Schwencke (1707–1785) — Professor of botany in The Hague and owner of a private botanical garden (Thijssse 2021). Where labels indicate that the origin is a garden in The Hague, then this must have been Schwencke's garden. After Schwencke's death the rare plants growing in his garden were auctioned.<sup>27</sup> Some plants were bought for the Leiden botanical garden.
- Hendrik Twent (1743–1788) (one specimen) — Son-in-law of Gaubius and mayor of Leiden.
- Steven Jan van Geuns and Matthias van Geuns. (c. 40 specimens) — Utrecht professors of botany.
- Murk van Phelsum (1730–1799) (10 specimens) — Studied in Harderwijk. After his PhD he became a physician in Bolsward, from 1764 in Sneek. His own collection, comprising nine book herbaria is held at the University Museum in Groningen.

#### David van Royen's correspondents outside Europe

##### Cape of Good Hope

- Rijk Tulbagh (1699–1771) — Governor of the Dutch Cape Colony from 27 February 1751 to 11 August 1771.

##### Sri Lanka

- Imam Willem Falck (1736–1785) — Governor of Ceylon (Sri Lanka) between 1765 and 1785. Two letters (Colombo 26 January and 5 February 1781) from Falck to D. van Royen are in the Naturalis archives.

##### Indonesia (Java)

- Johannes Themans (?–?) (one specimen) — VOC physician in Batavia. There is one letter from Themans (1776) to D. van Royen in the Leiden University library (Special collections BPL 609).

#### Visitors

Sometimes visitors or students brought herbarium specimens with them as a gift for David van Royen. On the labels David often noted by whom and when the material was donated. When Anders Kallström (1733–1812), gardener at the royal garden in Stockholm (Sweden) (Retzius 1791: 9), visited the Leiden botanical garden, during his tour through The Netherlands, France and England to study horticulture (Bergius 1770: 139) he must have given David van Royen the specimens that are annotated by David 'Kallström 1763'.

Two of David van Royen's Swiss students, Daniel DelaRoche (1743–1813) and Gaspard Vieusseux (1746–1814), who studied in Leiden between 1764 and 1766, gave him a set of specimens. These are almost all dated 1764. In his doctoral thesis DelaRoche (1766) described 20 new species of *Iridaceae*. Although Linnaeus received copies of this thesis from Burman and David van Royen, he never accepted any of the new species therein described (Lewis et al. 1972: xxix–xxv).

In 1773 the German physician and naturalist Ernst Ludwig Heim (1747–1834), together with the son of Friedrich Ludwig Hermann Muzel (1715–1784), travelled in The Netherlands. The c. 15 moss specimens from the Heim collections so far identified, would originally have been destined for the Amsterdam professor of anatomy and medicine Andreas Bonn (1738–1817). The text on the 'label' of *Hygrohypnum luridum* (Hedw.) Jess. (L 0221992; *Amblystegiaceae*) says: 'Donum Doctissimi Heim (aus Saxen Meinungen Cl: Munzelii berolinensis in itinere socio 17 7/1 73'. In addition, there is a note, dated 25 July 1773, asking Bonn if it was possible for them to pay him a visit. As Heim and Muzel had already left Leiden in June (Heim & Kessler 1846: 133–135), these specimens cannot have been given directly to David van Royen.

On behalf of his friend, Joseph Banks, James Edward Smith (1759–1828) brought with him a rich collection of West Indian ferns for David van Royen, when he came to Leiden in 1786 to obtain his medical degree (J.E. Smith 1793: 13, P. Smith 1832: 150, Du Rieu 1875: 1153, Kennett 2016). On the labels of these specimens David wrote, 'Amer. Merid. Banks 27/6 86'. Banks never went to the Caribbean. These ferns were likely collected by Swedish botanist Olof Swartz (1760–1818) who returned from there to England in 1786 and may be types.

#### Nurseries

According to labels on herbarium specimens, two Leiden commercial nurseries supplied living plants for the Leiden botanical garden. One of them was 'De Dadelboom', not far from the Leiden botanical garden and which was rather famous as is known from the visit of the German botanist Jakob Friedrich Ehrhart (1742–1795) in 1782 (Valckenier Suringar 1926: 139–140). The nursery was established by Adriaan Stekhoven (c. 1705–1782). In 1752 he was asked by Gerard van Swieten (1700–1772), the personal physician to Empress Maria Theresa (1717–1780), to come to Vienna to help with the design and maintenance of the gardens at Schönbrunn (Kuijlen et al. 1983: 59). Before Adriaan left for Austria, he consigned the garden ('De Dadelboom') at the Naakte Sluis (a sluice at Schelpenkade in Leiden) together with two other gardens in Leiden, one on the Delfse Vaart and another at Herenweg, to his son-in-law Jacob Schuurmans (c. 1731–1781), who shortly before had married Adriaan's daughter Maria Cornelia Stekhoven (1734–1783). Thereafter Jacob changed his name to Schuurmans Stekhoven (Pelinck 1961: 84–85). When Maria Cornelia died in 1783, the plants in the nursery were sold.<sup>28</sup> Some of them were bought for the Leiden botanical garden.

The second nursery from which living plants for the Leiden botanical garden were bought was 'Van Hazen & Co.', which was at Maredijk, Leiden, owned by Wilhelm van Hazen (Kuijlen et al. 1983: 59). A catalogue of the plants that were on sale there was published around 1755 (Van Hazen c. 1755). Thunberg, who visited the nursery in 1770, wrote that the nursery sold thousands of bulbs and an immense quantity of seeds, flowers, trees and shrubs (Thunberg 1792: 18). A small number of herbarium specimens made from plants originating from the nursery has been found. Van Hazen & Co. later became Van Hazen, Valkenburg & Co., so herbarium specimens such as *Asclepias longifolia* Michx. (L 0141691; *Apocynaceae*) 'ex horto Valkenburgii 1777' were made from plants from this nursery. However, 'Hortulanus Valkenburg', which is mentioned on *Habenaria bifolia* (L.) R.Br. (i.e., *Platanthera bifolia* (L.) Rich.; L 0076019; *Orchidaceae*), more probably refers to a gardener named Valckenburg at the Leiden botanical garden, who gave plant(s) to David de Gorter (Van Ooststroom 1941: 264).

<sup>27</sup> Rotterdamse Courant, 23 July 1785 (<https://www.delpher.nl/>, last accessed 24 April 2022).

<sup>28</sup> Leydse Courant, 1 September 1783 (<https://www.erfgoedleiden.nl/collecties/kranten>, last accessed 24 April 2022).

Living plants were also acquired from English nurseries such as Davi(e)s & Co. (probably William Davies, fl. 1780s; Desmond 1994: 197), Snow Hill, London, from the Scottish gardener and seed merchant, James Gordon (1708–1780) at Mile End in London (Sonneveld 2018: 128) and the ‘Pine Apple’ at Kennington Turnpike, Surrey (now Greater London) of the Scottish nurseryman William Malcolm († 1798). The Scottish tradesman, James Manson (1726–1788), living in Rotterdam, acted as an intermediary between David van Royen and Malcolm. Manson also took care of the exchange of seeds and living plants between them (Sonneveld 2018: 131). Nine letters from Malcolm, ten letters from Manson, and one letter from Gordon to David van Royen are in the Leiden University Library (Special collections BPL 1900). Transcriptions of Malcolm’s letters, as well as of one of Manson’s (Kensington Gore, 12 July 1768) were published by Sonneveld (2018: 73–101).

### Auctions

Another way of acquiring important herbarium specimens was through auctions of collections of other, often deceased, botanists. In 1717, the first natural history cabinet of the Amsterdam professor of anatomy, Frederik Ruysch (1638–1731), including 39 volumes with dried plants, was sold to Czar Peter the Great (1672–1725). After this, Ruysch continued assembling collections for a new cabinet. It is known that, in 1731, at the auction of his second natural history cabinet (Ruysch 1731a, b), all 27 herbarium volumes offered for sale in Amsterdam were bought jointly by J.F. Gronovius and Adriaan van Royen for £ 20 (in today’s money 3800 Euro).<sup>29</sup> David van Royen seems to have acquired herbarium specimens at the auction of Albinus’s library in 1771.

### The herbarium collections of Frederik Ruysch

In a letter to the Swiss-Russian botanist Johann Amman (1707–1741), Gronovius mentioned that some of the 27 volumes contained Japanese plants from Engelbert Kämpfer (1651–1716), besides plants collected by Georg Everhard Rumphius (1627–1702) on Ambon in the Moluccas, and plants from the Cape of Good Hope.<sup>30</sup> However, nothing that could have come from either Kaempfer or Rumphius has been found in the ‘Van Royen herbarium’, so these specimens may have ended up in Gronovius’s herbarium. Unfortunately, the whereabouts of that herbarium, with the exception of the Virginian plants collected by Clayton, now at BM, is unknown. There seems to be no connection with the four putative Rumphius specimens found in Hermann’s Sri Lankan herbarium at Naturalis (Van Andel et al. 2018).

According to the Dutch auction catalogue (Ruysch 1731a: 115–116) 16 of the 27 herbaria that were offered for sale were ‘t’zamengesteld’ (that is, composed) by Ruysch’s son Hendrik Ruysch (1663–1727). In the Latin catalogue (Ruysch 1731a: 93) they are referred to as ‘ab Henrico Ruyschio perfectus’ (that is, completed). Six other herbaria contained plants Hendrik had assembled himself, among which one with plants from Narbonne (France), another with African species of *Genista* L. (*Fabaceae*) and a third has African *Eruca* Mill. species (*Brassicaceae*). Besides these, there was a herbarium with Asian plants from (W.) Sherard and another one in which, besides plants from Sherard, there were also collections from others.

So far, only a few specimens that can be linked to this purchase have been found. Some of the specimens of James Petiver

(1658–1718) that are in the ‘Van Royen herbarium’ may also have formed part of the second herbarium of Frederik Ruysch.<sup>31</sup> Petiver corresponded with both Frederik and Hendrik Ruysch (Dandy 1958: 177) and was demonstrator at the Chelsea Physic Garden (Stafleu & Cowan 1983, Vol. 4: 203). In 1711 he travelled to The Netherlands on Hans Sloane’s behalf to be at the auction of Paul Hermann’s cabinet and met F. Ruysch during this visit (Coulton 2020: 205). For more on Petiver and his plant collections, see Jarvis (2020).

### The herbarium collections of Bernhard Siegfried Albinus (1697–1770)

In 1771, the herbarium of Albinus was auctioned in seven lots in Leiden. The third lot, comprising three bundles of plant specimens was described in the auction catalogue as follows (Anonymous 1771: 67):

‘Fasciculus I. Plantae acceptae a Seb. Vaillant. Nomina ipse addidit, & plurisque quidem omnibus sua manu in schedula adjecta adscripsit. Caetera à Gundelsheimero allisque scripta sunt, & a Vaillantio probata. Continentur in iis multae, quae a Tournefortio, ejusque sociis in itinere Orientali, in locis nativis decerptae sunt. Continentur, quae tantummodo nominatae in Corollario Tournefortii, & quae non nisi traditione cognosci possunt: multae etiam perierunt in horto Regio Paris. Fasciculus 2. [Idem]. Fasciculus 3. [Idem]. In quo etiam continentur plantae, quibus nomina ignota manu adscripta’

*Translation.* ‘Fascicle I. Plants received from Seb. Vaillant, who, in his own hand, added the names on the labels. Other [names] were written by [the German botanist Andreas] Gundelsheimer [1668–1715] and others, and were accepted by Vaillant. Many are collected by [the French botanist Joseph Pitton de] Tournefort [1656–1708] and his companions in their natural habitat on their journey to the Orient [in 1700]. There are some that are only mentioned in Tournefort’s *Corollarium* (1703) [which lists and describes the plant species collected during the journey to the Levant] and since many of them withered in ‘Horto regio Parisiensis’ can only be known by tradition. Fascicle 2. [Idem]. Fascicle 3. [Idem]. In which there are also plants, to which names were added by an unknown hand’.

Almost the same text is written on a note that was found in the collection management archive of Naturalis. Sometimes a clear reference to one of the auctioned bundles is written on a label (see Albinus in Appendix 3) of a specimen in the ‘Van Royen herbarium’, which are both clear indications that this lot was purchased by David van Royen. According to the note the third bundle of the lot contained 74 plants with names written in an unknown hand and 54 plants that were received from Vaillant. It is probable that Albinus had acquired these plants when he studied with Vaillant and Antoine de Jussieu in Paris in 1718 (Lubach 1887: 2–3).

In the ‘Van Royen herbarium’ 370 specimens with labels written by Vaillant have been found. They are often wrongly attributed to Gessner in an unknown hand. These Vaillant specimens were in this purchase, just like the specimens with labels written by Albinus (see Albinus in Appendix 3).

<sup>29</sup> Letter J.F. Gronovius (2 September 1731) to J. Amman (<http://dspace.ut.ee/handle/10062/11584>). <https://www.bankofengland.co.uk/monetary-policy/inflation/inflation-calculator>.

<sup>30</sup> Letter J.F. Gronovius (2 September 1731) to J. Amman (<http://dspace.ut.ee/handle/10062/11584>).

<sup>31</sup> Specimens from Petiver reached a number of herbaria (beyond that of Hans Sloane), sometimes via Sherard, e.g., a bound collection in Firenze (FI) (Nepi 2009: 87, f. 3). Some of Petiver’s specimens in the ‘Van Royen herbarium’ are mounted in the same way as Petiver’s specimens in Vaillant’s herbarium in P (MNHN-P-P00622211). It is therefore also possible that they ended up in the ‘Van Royen herbarium’ with the acquisition of the Vaillant collections of Albinus. Examples are: *Leucobryum glaucum* (Hedw.) Ångstr. (L 0222026) ‘e collect. Botanic. Jac. Petiver Lond. Pharm.’, and *Xenostegia tridentata* (L.) D.F. Austin & Staples (L 0141779) ‘ex Herbar. Vivo Jac. Petiver S.R.S., Ad Nob. D.D. Fred. Ruysch M.D.T.D.D.’ ‘E Madraspatan nobis communicata’.



**The trading posts of the Dutch East India (Verenigde Oost-Indische Compagnie, VOC) and Dutch West Indian Company (West-Indische Compagnie, WIC).**

As early as 1599, Pieter Pauw (1564–1617), Leiden professor of anatomy and botany, and Carolus Clusius (1526–1609), the first director of the Leiden botanical garden, came up with the plan to enrich the Leiden garden with East Indian plants and seeds, and the 'mineral collection' with spices, drugs and minerals. This was done by submitting a request via the curators of the university to the 'Oude Compagnie' (Old Company) founded in 1598. Together with other forerunners the Old Company would merge to form the VOC in 1602. In 1601, Clusius asked the administrators of the Old Company to instruct the surgeons and pharmacists on the outgoing ships to collect plants for the Leiden botanical garden (Veendorp & Baas Becking 1938: 44, Heniger 1973: 30–32, Otterspeer 2000: 196–197, Baas & Veldkamp 2013: 10). However, the introduction of plants from faraway places only really took off when the Cape Colony was founded in 1652, Sri Lanka came fully under Dutch rule in 1658, the Malabar Coast (India) came into Dutch hands in 1663, and Suriname was conquered in 1667 (Den Hartog & Teune 2003: 61).

In his time, Boerhaave succeeded in getting the captains of the ships of the VOC and WIC to be ordered to 'carry all kinds of curiosities [...] because the study of natural history is now more than ever flourishing' (Molhuysen et al. 1920, Vol. 4: 311; Veendorp & Baas Becking 1938: 101). In his *Index Alter* (1720) Boerhaave wrote that 'practically no captain of a merchant ship or a warship left our ports without instructions to collect everywhere seeds, roots, cuttings and shrubs and to bring them back to Holland' (Stafleu 1971: 9). Of the efforts made by Adriaan van Royen to obtain plants for the Leiden botanical garden in this way we know only indirectly by an order of 1750 and general resolutions of 1753 and 1757 of the Lords Seventeen of the VOC, to urge all merchants to send plants to the garden free of charge (Veendorp & Baas Becking 1938: 128).

In the database of Naturalis there are c. 280 'Van Royen specimens' from the Cape of Good Hope and c. 725 from Sri Lanka. From Java there are fewer specimens (c. 40) while plants from Suriname are rare, an example being *Senna fruticosa* (Mill.) Irwin & Barneby (L 0224692; *Fabaceae*) 'missus ex Syrinama A° 1735'. These 'exotic' plants had arrived in The Netherlands mainly during the directorship of David van Royen and were stored in the herbarium cabinet that was sold in the auction as Lot 2.

**Cape Plants sent by the Governor of the Cape Rijk Tulbagh (1699–1771)**

One of the first things Tulbagh did after he had become Governor of the Cape in 1751, was to fit out an expedition under the command of August Friedrich Beutler (born c. 1728). Beutler was urged to gather all possible information on the country's natural resources, including their commercial potential, as well as the customs and attitudes of the indigenous peoples. His team left at the end of February 1752 to explore the eastern Cape of South Africa (Gunn & Codd 1981: 56). It is not implausible that the herbarium specimens sent by Tulbagh to Leiden in August 1752 (Suringar 1867: 268–269) were collected during this expedition.<sup>32</sup> Unfortunately, no specimens have been found in the 'Van Royen herbarium' that can be attributed to

this shipment. In the years that followed, Tulbagh continued to send seeds, bulbs, rhizomes, living plants and herbarium specimens, not only to David van Royen in Leiden but also to both Burmans in Amsterdam.

The expedition to the Orange River (August 1761–April 1762) was led by Hendrik Hop (1716–1771), captain of the Stellenbosch Burgher militia. Also participating in this venture was Johann Andreas Auge (1711–1805), the gardener of the Company's garden in Cape Town. He was trained (c. 1730) in the Leiden botanical garden by Boerhaave and arrived at the Cape in 1747. From this expedition Auge brought back a large collection of plants of which many were new to science (Gunn & Codd 1981: 57, 83). The specimens and seeds that arrived in Leiden in the years 1762 to 1764 might have been collected during this expedition. One set of Cape specimens that can be recognised by the comprehensive information that is given on use, habitat, habit and sometimes locality (Hottentots Holland Kloof, Klipfontein) had arrived in 1767. The information added to the specimens in this set is written in the same handwriting as Tulbagh's letters to Linnaeus. Both the text on the herbarium sheet and the letters were probably written by a clerk and not by Tulbagh himself (Fig. 12).<sup>33</sup>

In February 1768, Tulbagh wrote to David van Royen that he had sent him, with the ship 'Ritthem' (Capt. Jacob de Frein), herbarium specimens and bulbs that were collected by Auge.<sup>34</sup> Of this shipment no specimens have been identified.

Evidence of later shipments from the Cape are the specimens in the 'Van Royen herbarium' with the annotation '69' or '70' in the lower right-hand corner, probably referring to the year in which these specimens were received. Besides to Leiden and Amsterdam, Tulbagh also sent living and dried plants, seeds and bulbs to Linnaeus in Sweden (Thunberg 1792: 100). Like David van Royen, also Linnaeus received Cape plants from Tulbagh in the summer of 1769. Later that year Linnaeus also received Cape plants that had been collected by König in April 1768, on his way to India (Lewis et al. 1972: xxv).

**Specimens received from the Cape in the period when Thunberg was active there**

In December 1771, Thunberg sailed to the Cape as a physician in the service of the VOC. He was commissioned by the administrators of the Amsterdam Hortus to visit the Dutch Colonies and Japan to collect plants for their garden. When Thunberg arrived, Tulbagh had already died and had been succeeded by Joachim Amana van Plettenberg (1739–1793) who resigned in February 1785.

From April 1772 to March 1775 Thunberg undertook three longer expeditions to the interior. The Cape plants in the 'Van Royen herbarium' with the annotation '72', '73', '74', or '4', '5' in the lower right-hand corner of the sheet may have been collected by Thunberg and received in Leiden in the years 1772–1775. They possibly represent the plants in the parcels with Thunberg's Cape plants that were seen by Schultes in 1824 (Schultes 1824: 724). Some are erroneously attributed to [P.J.] Bergius, e.g., *Relbania fruticosa* (L.) K.Bremer (i.e., *Oedera fruticosa* (L.) N.G. Bergh; L 0144022; *Asteraceae*). Although Thunberg was not supposed to, he also dispatched plants from the Cape to his friends in Sweden. Of the remaining specimens of the sets of living and dried Cape plants Thunberg had sent to Leiden and Amsterdam in 1773, he not only shipped plants to Linnaeus, but also to Abraham Bäck (1713–1795), Bergius and Lars Montin (1723–1785) (Juel 1918: 7). In 1774 and 1775

<sup>32</sup> 'Kaapse vogels, insecten, gedroogde planten en een tekening van een *Aloë hepatica*, welke laatste schenking in handen van de botanicus Adriaan van Royen werd gesteld' (Cape birds, insects, dried plants and a drawing of an *Aloe hepatica*, which last gift was handed over to the botanist Adriaan van Royen.) Archive of Curators, 8 August 1752. Leiden University Library, AC1, 33 p. 353.

<sup>33</sup> Letter R. Tulbagh (20 March 1769) to Linnaeus (Linnaean correspondence L4196).

<sup>34</sup> Letter R. Tulbagh (26 February 1768) to D. van Royen (VOC archives Cape Town, South Africa).

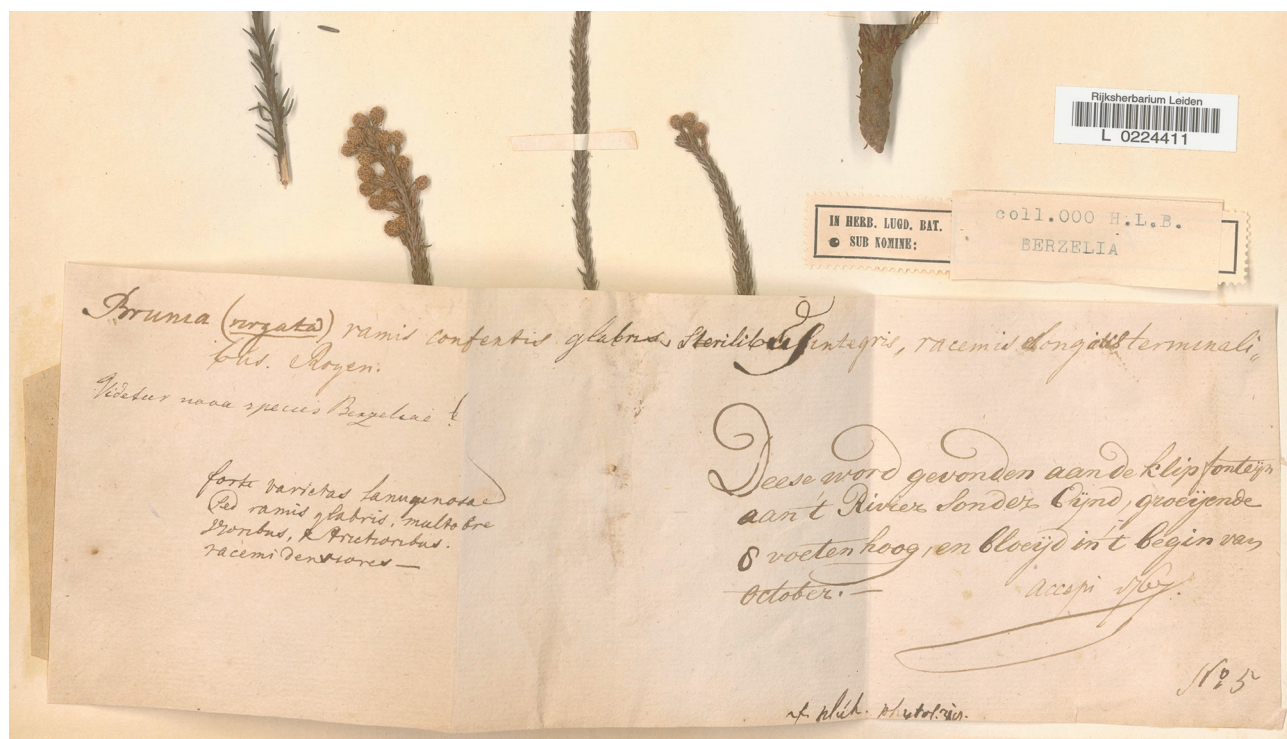


Fig. 12 Label belonging to a collection of *Berzelia* Brongn. (L 0224411; *Bruniaceae*) that arrived in Leiden from the Cape in 1767. It was found at Klipfontein on the Riverzondereind ('Deese word gevonden aan de Klipfonteyn aan 't Rivier Sonder Eijnd', 'acepi 1767').

Thunberg also sent plants to Linnaeus (Lewis et al. 1972: xxvi). So far no plants have been found that are dated after Thunberg's departure in 1775. It seems that subsequently since that time very little material from the Cape arrived in Leiden. However, as most of the Cape plants in the 'Van Royen herbarium' are undated, it is difficult to substantiate this supposition.

### The annual shipments from Sri Lanka

As a result of an ordinance issued by the commander of Malabar, Hendrik Adriaan van Reede tot Drakenstein (1636–1691) in 1691, in which he urged the governors of India (Malabar, Suratte, Coromandel and Bengal) and Sri Lanka to send seeds and (herbarium) plants to The Netherlands, shipments from Sri Lanka arrived every year. They were dispatched from Colombo in two consignments. One was intended for the gardens of the Stadtholder-King Willem III (1650–1702) at Het Loo palace in Apeldoorn and the now lost palace in Honselersdijk, the other for the Amsterdam Hortus. After the death of Willem III, his share was sent to the Leiden botanical garden (Heniger 1988: 78).

The crates with plant material were shipped to The Netherlands in November–January and arrived the next year on Texel in May–July.<sup>35</sup> In general these shipments consisted of an average of 150 species and were addressed to the VOC chambers (= branches) of Amsterdam and Delft, but sometimes it was explicitly mentioned on the packing list that the seeds or plants should be sent to Leiden botanical garden. Several dozens of these lists are in the VOC archives in the National Archives in The Hague.<sup>36</sup> According to these lists botanical material was sent to Leiden in 1735, 1737, 1740, 1741, 1742, 1744, 1748, 1749, 1753, 1754, 1755, 1756, 1759 and 1761.<sup>37</sup>

Although 1761 is the last year that Leiden is mentioned as destination on the packing lists in the National Archives, this does not mean that shipments of botanical material from Sri

Lanka did not arrive in later years. Such consignments were probably sent to the Leiden botanical garden through the influence of Falck, who was governor between 1765 and 1785. In 1771, Burman wrote to Falck that he had been informed that Falck had sent living plants and a 'Herbarius Vivus' to Adriaan van Royen (Van Dulm 2012: 307). Since Burman wrote this in 1771, he presumably meant David, and not Adriaan, van Royen. The 'Herbarius Vivus' he mentioned may well be the 'recently received herbarium' that David showed to Thunberg in October 1770 (Thunberg 1792: 16). According to the data on the labels, Falck had sent seeds to Leiden in 1772, 1773 and 1774 and in 1773 herbarium specimens as well (see Appendix 3).

The latest surviving packing list in the National Archives associated with a shipment destined for the Leiden botanical garden is dated 6 November 1779, and concerns seeds of medicinal plants for Professor van Royen.<sup>38</sup> The list in the Naturalis archives of [seeds? of] medicinal plants from Sri Lanka that had arrived in 1780 is possibly a copy. In 1781, Falck promised David to send him plants that were collected by König (see Lot 5) and some collections of *kassan* (or *kaassa*; *Memecylon edule* Roxb.; L 0144489; *Melastomataceae*).<sup>39</sup> The latter specimens were collected by the Commander of Calpetti (now Kalpitya) and Putulang (now Puttalam), Elias Paravicini

<sup>35</sup> Letter J. Heniger (15 March 1983) to P.W. Leenhouts (Naturalis archives).

<sup>36</sup> Other lists are in the Royal Botanic Gardens, Peradeniya (Petch 1917: 291–305).

<sup>37</sup> National Archives, The Hague, 1.04.02. 1735. Inv. 2335, p. 2025–2027 (Herbs and seeds), 1737. Inv. 2400, p. 115–116 (Seeds), 1740. Inv. 2490, p. 20–21 (Seeds and plants), 1741. Inv. 2542, p. 1859–1860 (Garden seeds), 1742. Inv. 2560, p. 2076–2077 (Garden seeds), 1744. Inv. 2622, p. 2850 (Garden seeds), 1748. Inv. 2713, p. 1159–1162 (Garden seeds), 1749. Inv. 2713, p. 1159–1162 (Garden seeds), 1749. Inv. 2736, p. 1216–1217 (Seeds of medicinal plants), 1153. Inv. 2814, p. 2017–2018 (Garden seeds), 1754. Inv. 2833, p. 1160–1161 (Garden seeds), 1755. Inv. 2856, p. 2075–2076 (Garden seeds), 1756. Inv. 2881, p. 1206 (Garden seeds), 1759. Inv. 2953, p. 67 (Garden seeds), 1761. Inv. 3011, p. 163 (Garden seeds). Heniger (1988: 78–79) states that the consignment of seeds sent to Delft in 1746 by the head surgeon in Ceylon was intended for the Leiden botanical garden.

<sup>38</sup> National Archives, The Hague, 1.04.02, Inv. 3543, p. 250.

<sup>39</sup> Letter I.W. Falck (Colombo 5 February 1781) to D. van Royen (Naturalis archives).





Fig. 13 Examples of small labels, probably cut from the accompanying packing list, that are present with the seeds (ette = seeds) remaining from the yearly dispatches from Sri Lanka.

di Capelli (1733–1795). From then on the dispatches apparently became less regular. In his letter of 24 February 1784 to Gómez-de Ortega, David van Royen wrote that he had not received plants and seeds from the Cape or from Sri Lanka for two years.<sup>40</sup> However, in 1785 another shipment of seeds from Colombo arrived in Leiden (Petch 1917: 297–305), followed by dispatches in 1787 and 1788.<sup>41</sup>

Sowing these seeds was not always very successful. David van Royen wrote to Linnaeus that he would be happy if only about 50 % of the seeds would germinate, so that he could enrich Linnaeus's *Flora Zeylanica* (1747) with new species.<sup>42</sup>

Probably to improve the results David had drafted instructions in 1779 for better preservation of the seeds that were shipped, which he sent to Falck, who had the instructions translated into Sinhalese for the benefit of the plant collectors.<sup>43</sup> Although there is no mention in the sale catalogue of a separate collection of fruits and seeds, there are c. 160 samples that can be attributed to the Van Royens in the fruit and seed collection of the former Rijksherbarium: 135 are from Sri Lanka which can only be the remnants of the shipments of seeds from Sri Lanka (Fig. 13). The labels bear the dates 1754, 1755, 1758, 1759 and 1766 and are attributed to König by an unknown hand. However, König had left Denmark for India in 1768 (Rendle 1933: 143), which make it improbable that he was the collector.



Fig. 14 Labels of specimens belonging to different consignments of (herbarium) specimens from Sri Lanka. From left to right and from top to bottom: N° 12 'Aglu Cole' = *Morinda citrifolia* L. (L 0143035; Rubiaceae); N° 15 'Visnoe Karantli' = *Evolvulus alsinoides* (L.) L. (L 0141719; Convolvulaceae); N° 35 'Malaoendopiel' = *Aralia hispida* Vent. (L 0140054; Araliaceae); N° 193 'Wela Cole' = *Cleome gynandra* L. (L 0052914; Cleomaceae); N° 31 'Kiene' May 1768 with a trace of red lacquer = *Calophyllum calaba* L. (L 0052988; Calophyllaceae); N° 17 'Emboelembilie' = *Oxalis corniculata* L. (L 0140163; Oxalidaceae); N° 100 'Dimmotte' Feb. 1771 = *Hugonia mystax* L. (L 0144769; Linaceae); N° 78 'Poehoe Wel' = *Benincasa hispida* (Thunb.) Cogn. (L 0328469; Cucurbitaceae); N° 149. Moeswenne = *Pyrrosia heterophylla* (L.) M.G.Price (L.3594521; Polypodiaceae).

Specimens in the 'Van Royen herbarium' with 'labels' on which the Sinhala name of the plant in Latin script is given, probably formed part of these annual shipments. On the basis of the handwriting, several different numbered sets can be distinguished (Fig. 14). So far more than 100 such specimens have been encountered.

#### Plants from Java

In the auction catalogue the plants from Java are specifically mentioned, so it is remarkable that they are present in only small numbers in the 'Van Royen herbarium' compared to the

<sup>40</sup> Letter D. van Royen (24 February 1784) to C. Gómez-de Ortega (Real Jardín Botánico, Madrid, Sign. AJB, Div. I, 20, 5, 29).

<sup>41</sup> National Archives, The Hague, 1.04.02, Inv. 3723, p. 1271–1272, Inv. 3788, p. 1087–1088 and Inv. 3791, p. 2459–2460).

<sup>42</sup> Letter D. van Royen (26 March 1760) to Linnaeus (Linnaean correspondence L2693) and D. van Royen (3 March 1761) to Linnaeus (Linnaean correspondence L2891).

<sup>43</sup> Letter I.W. Falck (Colombo 5 February 1781) to D. van Royen (Naturalis archives).

specimens from the Cape and Sri Lanka. There are also few records of shipments of seeds, plants and herbarium material from Java. On 17 August 1752 four crates with plants and herbs arrived in Enkhuizen from the East Indies that were destined for Leiden (Otterspeer 2002: 124).

To obtain plants from Java, David van Royen corresponded with the VOC physician Themans in Batavia. He was a member of the Bataviaasch Genootschap van Kunsten en Wetenschappen (Batavian Society for Arts and Sciences) founded by Jacob Cornelis Matthieu Radermacher (1741–1783) in 1778 (Van Steenis-Kruseman 1950: 424). In 1779, the members of the Batavian Society were asked to send natural rarities to Batavia (modern Jakarta) for the Society's cabinet. Plants and seeds were sent onwards to The Netherlands according to the instructions as drawn up by David van Royen. On request the Batavian Society was willing to send collections for the natural history cabinets of Dutch universities (Anonymous 1779: 16–18, 23–30). Coincidence or not, in that same year David received a shipment of herbarium specimens from Java. An example is mango, *Mangifera indica* L. (L 0052956; *Anacardiaceae*), 'Batavia indorum missam accepi mense Junio 1779'. With the same shipment he must have received a piece of rootwood, 'Radix Joh. Lopez è Java 1779' (L 0368016), possibly *Toddalia asiatica* (L.) Lam. (now *Zanthoxylum asiaticum* (L.) Appelhans, Groppo & J.Wen; *Rutaceae*) (Oudemans 1865: 52).

### THE SPECIMENS IN LOTS 3 TO 7

The herbarium cabinets sold as lots 1 and 2 contained plants with diverse origins and collected by different botanists. The other five lots comprise plants from a single collector or owner, or are from only one region.

#### Lot 3 – The herbarium with specimens listed in Van Royen's *Florae Leydensis Prodrum* (1740)

It is clear that Adriaan van Royen not only intended to write a new garden catalogue in which he wanted to include all the species that grew in the enlarged Leiden botanical garden, but also to assemble a special herbarium in which they were all represented as voucher material. The specimens that belonged to this collection are generally mounted with printed ornamental vases and ribbons, and the text of *Prodrum* (A. van Royen 1740) is often copied verbatim on the sheets (Fig. 15). Sometimes older labels written by Adriaan are present, on which he does not refer to *Prodrum* or to Linnaeus's *Hortus Cliffortianus* (Linnaeus 1738). Occasionally there are even labels written by Boerhaave (Fig. 16). Apparently, Adriaan not only used new collections for this herbarium, but also used previously collected specimens, probably taken from a garden herbarium that he had already started. That he had started making a garden herbarium before is clear from the notes he made in his own copy of Boerhaave's *Index Alter* (Boerhaave 1720). Therein he not only added the species that were not mentioned by Boerhaave, but also the names of taxa that he considered to be new or insufficiently known. These were given a number continuing the numbering of Boerhaave and the annotation 'NB' (perhaps the abbreviation of 'nota bene'). Adriaan gave new varieties the Boerhaave species number, followed by a second one, e.g., 6/4. These numbers are also on the labels of herbarium specimens of the supposed new species and varieties (Fig. 17).

#### Lot 4 – A set of Hermann specimens

How these Hermann specimens were acquired by one of the Van Royens is not clear. So far, only five specimens with labels written by Hermann have been found. However, they are not of species that occur in Sri Lanka and so these specimens



Fig. 15 *Canna indica* L. (L 0052844; *Cannaceae*) from Adriaan van Royen's garden herbarium (Lot 3). The text below the specimen was written by Adriaan and was taken verbatim from his *Prodrum* (A. van Royen 1740).

are not related to Herman's parcel of Sri Lankan plants that Schultes saw in 1824 (Schultes 1824: 724).

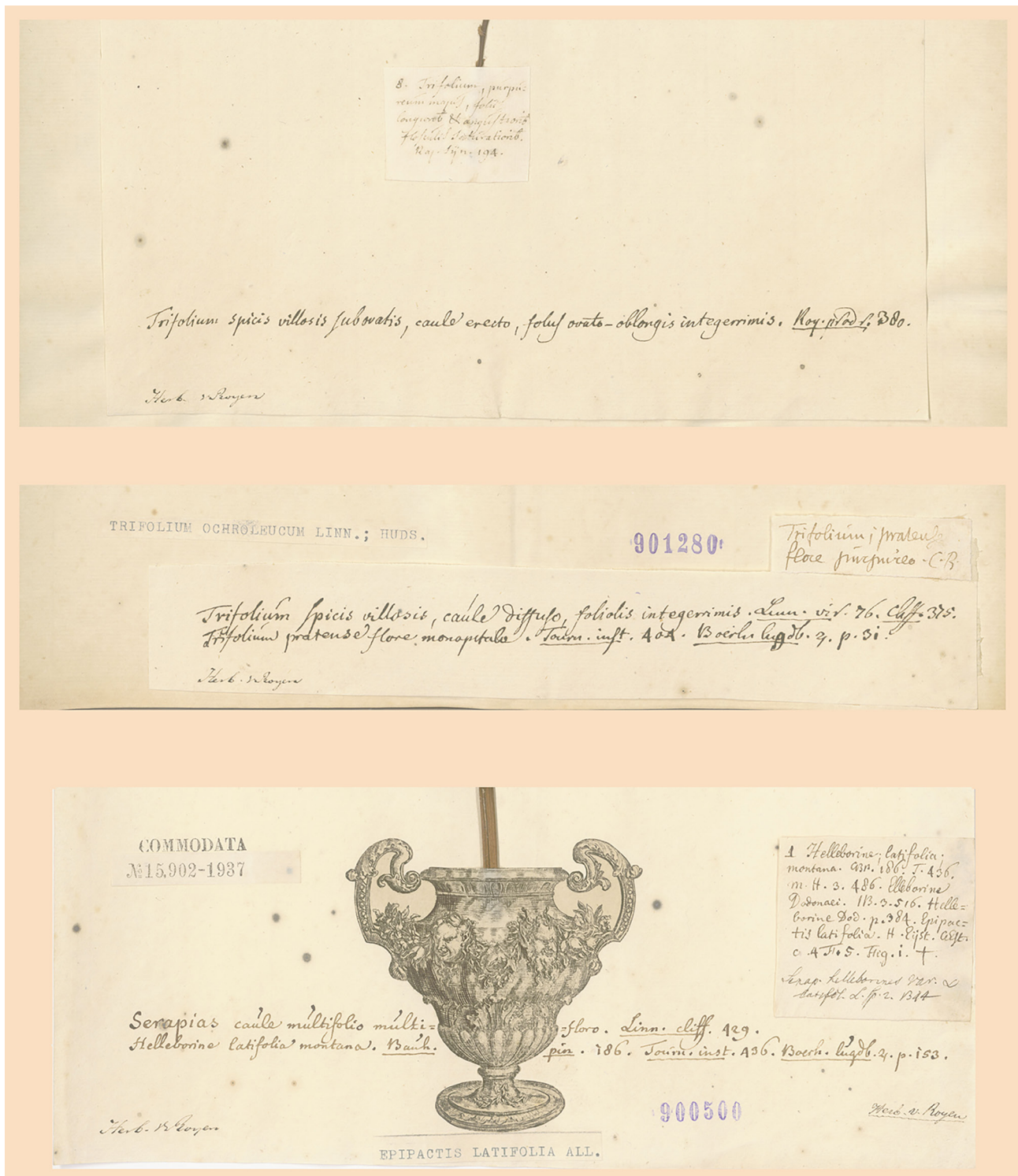
#### Lot 5 – Plants collected by König in Sri Lanka

In 1768 König went to India in the Danish service as surgeon and naturalist at Tranquebar (now Tharangambadi). In 1774 he entered the service of the Nawab of Arcot, the ruler of the Carnatic, the coastal area in the far south of India along the Bay of Bengal. König remained there until July 1778 (Rendle 1933: 143). In 1777 he made his first journey to Sri Lanka (Russell 1795). Lists of specimens sent by König to European botanists dating from 1773 to 1785 are at BM (Rendle 1933: 153).

Governor Falck informed David van Royen about König's arrival in Sri Lanka in 1781. König would stay there several months to investigate the different kinds of cinnamon that were growing on the island. Falck promised to send David plants that were collected by König.<sup>44</sup> Some of König's specimens, e.g., *Hunteria zeylanica* (Retz.) Thwaites (L 0053037; *Apocynaceae*) 'Cameraria nova König', are dated 1784, the year he travelled from Tranquebar to Calcutta (Kolkata) and were probably collected in India, and not in Sri Lanka (Rendle 1933: 143).

<sup>44</sup> Letters I.W. Falck (Colombo 26 January and 5 February 1781) to D. van Royen (Naturalis archives). The journal of König's voyage to Sri Lanka (7 January 1781–11 April 1781) is at BM (Russell 1795).





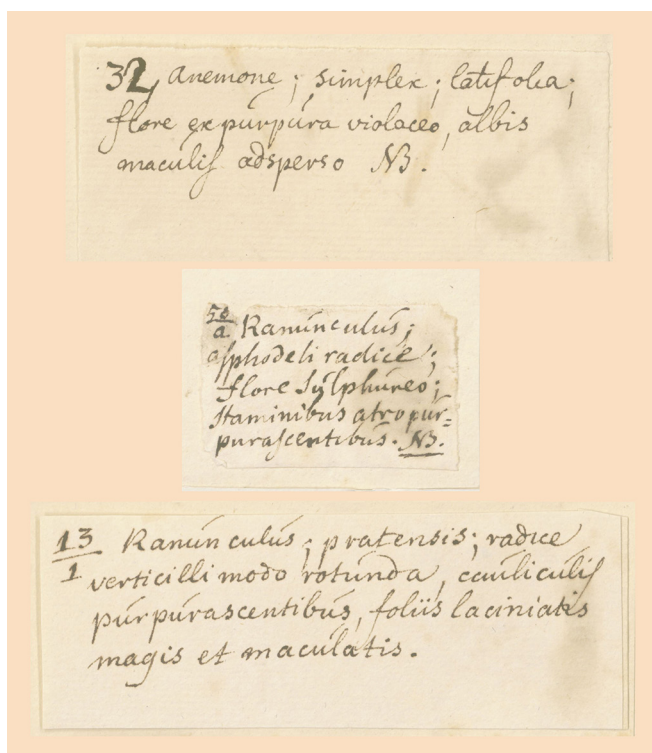
**Fig. 16** Specimens from Adriaan van Royen's garden herbarium (Lot 3) to which 'older' labels written by Adriaan are added: *Epipactis helleborine* (L.) Crantz (L 0222527; *Orchidaceae*) and *Trifolium medium* L. (L 0140041; *Fabaceae*). The small label on the middle specimen, *Trifolium ochroleucon* Huds. (L 014043), in the hand of Boerhaave.

König's collections were often originally mounted on the sheets with red sealing wax. Most of them were later remounted, but the plants often still show wax traces. However, attributing specimens to König only by the presence of red sealing wax must be done with caution. Apparently, the specimens of the annual shipments from Sri Lanka were sometimes mounted in this way as well (Fig. 18).<sup>45</sup>

The separate König set (Lot 5) consisted of 335 specimens. The number of specimens attributed to him in the Naturalis database, however, is c. 425, though some attributions may be incorrect. Sometimes, a Sri Lankan specimen has been provided with a small label 'Collection 309 Koenig Ceylon' by staff of the then collection management team. Apparently, a separate König collection once existed. Specimens with labels numbered K 1, K 2, K 3, etc. were also included, but these never belonged to the 'Van Royen herbarium' (Fig. 19). The specimens that originally belonged to Lot 5 are probably those with small labels written by König himself (Fig. 20).

<sup>45</sup> Other examples of plants mounted with red sealing wax are found in the Burman herbarium (G-Burman) that were collected by the Dutch VOC physician Laurent Garcin (1683–1752) in Java and Persia (Iran). See Cook 2016: 35, f. 2; 40, f. 7.





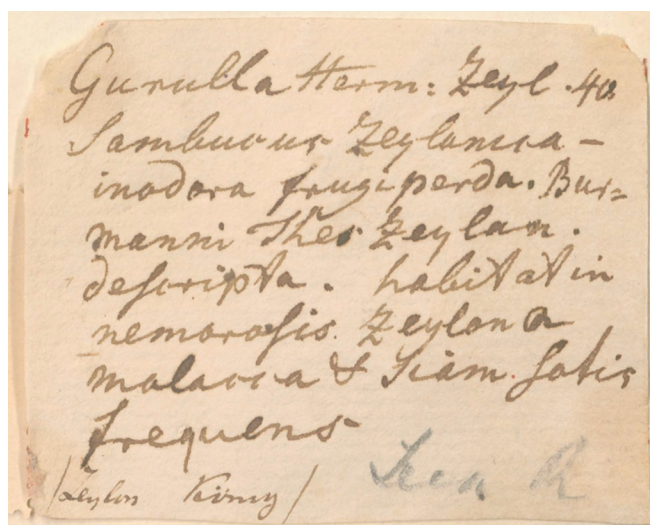
**Fig. 17** From top to bottom: *Anemone hortensis* L. (L. 0223636; *Ranunculaceae*). According to the label Adriaan van Royen added this species in his copy of Boerhaave's *Index Alter* (Boerhaave 1720) as new for the garden and gave it number 32. *Ranunculus asiaticus* L. (L. 0223755; *Ranunculaceae*). Adriaan considered this specimen to be a variety of Boerhaave's *Ranunculus* number 50 that was not listed by Boerhaave. *Ranunculus bulbosus* L. (L. 0223773). According to Adriaan's note in his copy of the *Index Alter*, this was a variety of Boerhaave's *Ranunculus* number 13.



**Fig. 18** A specimen of *Cardiospermum microcarpum* Kunth (L. 0144750; *Sapindaceae*) from Sri Lanka, mounted with red sealing wax. The identification below the Sinhala name N<sup>o</sup>: 12 'Penele Kole' is added by David van Royen. The name above and the annotation in the lower left and right corners of the label are written by Carl Ludwig Blume, director of the Rijksherbarium from 1829 until his death in 1862. This specimen probably arrived in the same consignment as N<sup>o</sup> 31. 'Kiene' May 1768, *Calophyllum calaba* L. (L. 0052988; *Calophyllaceae*), of which the label shows a trace of red lacquer (see Fig. 14).



**Fig. 19** Two labels of specimens that belonged to a separate 'König collection' at the Rijksherbarium. At the top the label of *Cryptolepis buchananii* Roem. & Schult. (L. 2704273; *Apocynaceae*) 'N° 38 Welmoekatne' and at the bottom the label of *Garcinia* sp. (L. 0329468; *Clusiaceae*) 'Mendieje Cejl: that is numbered 'K 72'. Specimens numbered K 1, K2, K3 etc. never were part of the 'Van Royen herbarium'.



**Fig. 20** Label of *Leea indica* (Burm.f.) Merr. (L. 0101979; *Vitaceae*) written by Johann Gerhard König.



The presence at L of a collection of Sri Lankan plants which was never part of the Van Royen Herbarium, may have led to errors in attribution. In 1835, when Willem Hendrik de Vriese (1806–1862) was professor at the Amsterdam Athenaeum, he had found there some Amboinese wooden cases with herbarium specimens. These cases turned out to contain two sets of plants, one with plants from Sri Lanka, the other with plants collected by Thunberg at the Cape and in Japan. Most of the Sri Lankan plants were illustrated in the elder Burman's *Thesaurus Zeylanicus* (Burman 1736). The Cape and Japanese specimens were depicted in Thunberg's *Flora Japonica* (Thunberg 1784) and *Flora Capensis* (Thunberg 1818–1820) (Wijnands et al. 1994: 175, Bouman et al. 2005: 8).

The Sri Lankan specimens came from Amsterdam to Leiden with the arrival of De Vriese as director of the Leiden botanical garden in 1845. Evidence for this is found in what De Vriese wrote on the label of a specimen originally named *Laurus cassia* Nees (the specimen is now identified as *Cinnamomum verum* J.Presl; U 1406301; *Lauraceae*), '[E]t reperitur sub hoc nomine in reliquiis herbarii Burmanniani quae servantur in Horto Bot. Amst'. *Translation*. [A]nd is found under this name in the relics of the Burmannian herbarium preserved in the Amsterdam Hortus]. This also reveals that these specimens originally came from the Burman herbarium (Fig. 21). After the transfer of the herbarium of the University of Amsterdam (AMD) to Naturalis in 2000, several more collections that had been retained in Amsterdam were transferred to Naturalis in 2019. Among these, Thunberg's Cape plants found by De Vriese in the Amsterdam Hortus were (re)discovered.

#### Lot 6 – Plants collected by Thunberg in Japan

In the auction catalogue it is stated that the herbarium with plants collected by Thunberg in Japan contained over 200 plants. However, according to the note in the Naturalis archives that refers to these specimens this set contained some 285 specimens. The full text of this note reads:

'Ducentae 85 aliquot Plantarum Japonicarum species lectae circa A. 1776 in locis natalibus à viro Clar. Carolo Petro Thunberg nunc Professore Upsaliensis:

qui plurisque nomina ipse adscripsit: eas Bataviae apud Indos donavit Ampl. J.C.M. Radermacher atque is 1783 Davidi van Royen omnes ille ad Cl. Thunberg in Floram Japonicam (editam Lipsiae 1784 in 8°) disposuit.

Oppido raras esse Plantas japonicas docet Florae illius praefatio.

Etenim praeter unam belgicae Legationis ad Imperantem oportunitatem, Europaeis Japoniam ingredi et perlustrare sit interdictum'

*Translation*. 'Some 285 species of Japanese plants collected around the year 1776 in their places of origin by the Most Distinguished Carl Peter Thunberg, now professor in Uppsala: who to most of these [he] added the names himself: these (plant species) in Batavia in India (the Dutch East Indies) he gave to the Right Honourable J.C.M. Radermacher, and he (Radermacher) to David van Royen; he (David) set them all in order for the Most Distinguished Thunberg to be included in the *Flora Japonica* (published in Leipzig 1784 in octavo). The preface of that *Flora* informs us that Japanese plant collections were exceedingly rare. For indeed, apart from the one occasion of the Dutch Legation to the Emperor, Europeans were forbidden to enter and roam Japan.'

This set consists of specimens that were left by Thunberg in Java when he returned to The Netherlands in 1777. They were taken by Radermacher, who returned from Batavia to The Netherlands on the ship Java in 1783. However, a mutiny broke out and Radermacher was killed by a member of the Chinese crew (Van Steenis-Kruseman 1950: 424). Nevertheless, these plants, which are duplicates of the specimens used by Thunberg for his *Flora Japonica* (Thunberg 1784) reached Leiden. So far 177 specimens have been found. Often the generic name was added by Thunberg himself.



**Fig. 21** Labels of Sri Lankan plants from the 'Burman herbarium' that were discovered by Willem Hendrik de Vriese in the Amsterdam Hortus in the early 19th century. The Latin plant names on the first two labels in the middle row were written by Carl Ludwig Blume.



Fig. 22 A selection from the many handwritings that are encountered in the 'Van Royen herbarium' of which it is so far unknown to whom they can be attributed.

#### Lot 7 – Plants collected in The Netherlands

This lot consisted of several hundred Dutch plants collected in and around Leiden as well as in the Leiden botanical garden. In most instances, these Dutch plants would have been collected by the head gardener, or more probable by one of the other gardeners. They all had the task to search at the right time for all native plants, including their seeds or fruits, that were not (or no longer) growing in the Leiden botanical garden (Molhuysen 1920, Vol. 4: 29).

So far, only 80 Dutch specimens have been found, most of which, as stated in the catalogue, were collected in or around Leiden. Examples are *Apera spica-venti* (L.) P.Beauv. (L 0220914; *Poa-ceae*) '1761, 26 July. Groeijt aan de postweg tussen het Schouw en de Rhyburgsche weg voor de woningen aldaar liggende [Grows in front of the houses on the post road between the Schouw and Rijnsburgerweg]', *Cerastium semidecandrum* L. (L 0223266; *Caryophyllaceae*) 'Naakte Sluis' and *Chenopodium ficifolium* Sm. (L 0222929; *Amaranthaceae*) 'Aan 't Delftse jaagpad omtrent het Schouw [Along the Delft towpath around the Schouw]'. Some, especially species of grasses are mentioned in *Flora Leidensis* (1840) of Molkenboer & Kerbert.

The majority of the Dutch Van Royen specimens were found in the herbarium of the 'Nederlandse Botanische Vereniging' (Dutch Botanical Society) founded in 1845 and are stamped NBV. They ended up there after 1872 when the herbarium of the Society was relocated to one of the rooms of the Rijksherbarium and it was decided to transfer all Dutch collections of the Rijksherbarium to the Botanical Society, with the exception of one specimen of each species (Suringar 1872). Apparently not all specimens originated from the auction in 1800; an unknown number was donated by the botanist Julian Hendrik Molkenboer (1816–1854), who was one of the founders of the Botanical society.<sup>46</sup> He had bought a parcel with 'Van Royen herbarium'

specimens at an auction in Leiden several years before 1847 (Boursse Wils 1848: 520). It is unknown how and when they had gone astray from the 'Van Royen herbarium' or by whom they were offered for sale.

#### VAN ROYEN SPECIMENS IN OTHER HERBARIA

By donation and exchange, specimens from Adriaan and David van Royen found their way into other herbaria. When Linnaeus was in Leiden to assist Adriaan with the rearrangement of the Leiden botanical garden, he not only obtained many living specimens, but also received many herbarium specimens from him (Pulteney 1805: 574, Fée 1831: 323, Lasègue 1845: 556). These are still in Linnaeus's own herbarium in London (LINN) and in Stockholm (S-LINN). Van Royen specimens are also in the herbarium of Clifford (BM), that of Sherard (OXF), the herbarium of J. Burman, and his son N.L. Burman (G) and De Candolle's herbarium at G. The Van Royen specimens in Munich (M) are found among the herbarium specimens of Casimir Christoph Schmi(e)del (1718–1792) (information received from Hans-Joachim Esser, curator at M, in 2014). Schmidel was professor of medicine in Bayreuth and later professor of anatomy and botany in Erlangen (Stafleu & Cowan 1985, Vol. 5: 237).

<sup>46</sup> With the exception of three specimens (*Teucrium chamaedrys* L. subsp. *germanicum* (F.Herm.) Rech.f. (L 0836612), *T. scordium* L. (L 0836611), and *Bupleurum rotundifolium* L. (L 0836610)) which he donated to the Botanical Society (Boursse Wils 1848: 520).





**Fig. 23** Labels written by Adriaan van Royen. The numbers on these labels refer to the number of the species within a genus in Boerhaave's *Index Alter* (1720). To all but one David van Royen has added the Linnaean names. From left to right and from top to bottom: L 0144764 *Hedysarum viridiflorum* L. (now *Desmodium viridiflorum* (L.) DC.; Fabaceae), L 0223673 (*Clematis integrifolia* L.; Ranunculaceae), L 0144113 *Solidago minuta* L. (now *S. virgaurea* L.; Asteraceae), L 0223842 (*Epimedium alpinum* L.; Berberidaceae) and L 0223842 (now identified as *Chrysojasminum fruticans* (L.) Banfi; Oleaceae).



## ATTRIBUTING SPECIMENS

Attribution of herbarium specimens to a collector can be straightforward from the text on the herbarium label.<sup>47</sup> When the text is not informative, handwriting analysis and in the ‘Van Royen herbarium’ the decorations with which the specimens were mounted can provide circumstantial evidence for specimen attribution.

### Handwritings

In the ‘Van Royen herbarium’ many different handwritings can be distinguished. However, attributing a specimen to its original owner on the basis of the handwriting on the labels is a hazardous exercise, especially for those who lack handwriting expertise. Furthermore, a person’s handwriting changes over time. Nevertheless, in Appendix 3 are examples of handwritings of which we are sufficiently certain, on robust or indirect evidence, by whom they were written or from whose herbarium they originated. A number of unrecognised handwritings are shown in Fig. 22.

The handwritings of Adriaan and David van Royen are relatively easy to tell apart (Fig. 23). In differentiating between their specimens, however, one must bear in mind that, after 1763, David van Royen updated the names of the plants in accordance with the second edition of Linnaeus’s *Species Plantarum* (1762–1763).<sup>48</sup> It is therefore common to find on a sheet the more modern name written by David together with the older name in Adriaan’s handwriting.

Because the ‘Van Royen herbarium’ and that of Nicolaas Meerburg were merged in the past, the attribution of specimens to the ‘Van Royen herbarium’ sensu lato can sometimes be extremely complicated, in the first place because the herbarium of Meerburg also contained Van Royen specimens (Anonymous 1816: 214). This means that if, on a herbarium sheet not only the handwriting of one of the Van Royens (Fig. 23), but also that of Meerburg is present (Fig. 24, 25), it can no longer be determined with certainty from whose herbarium it originated. Another complicating circumstance is that Meerburg had come into possession of a set of duplicate specimens from the herbarium of J.F. Gronovius. These were found in Meerburg’s herbarium by Joseph Franz von Jacquin (1766–1839) when he visited the Leiden botanical garden in 1788 and included plants that his father, N.J. Jacquin, had sent to Gronovius in the year (1752) he had arrived in Vienna (Kronfeld 1921: 143). Sometimes the handwriting of Laurens Theodorus Gronovius is also present (Fig. 26), indicating that Meerburg must have acquired his Gronovius specimens only after 1762, when Laurens Theodorus inherited the herbarium after his father’s death and before 1778 at the latest, when the Gronovius herbarium was auctioned in Leiden (Meuschen 1778).

Many of the c. 150 known Gronovius’s specimens have been attributed by Blume’s assistant Pierot and others to the ‘Van Royen herbarium’. Both Van Royens undoubtedly received herbarium specimens directly from Gronovius (Fig. 27), but,



Fig. 24 Watercolour of the bloody crane's-bill (*Geranium sanguineum* L.; Geraniaceae) by Nicolaas Meerburg (Naturalis archives). The references are written by Meerburg himself.



Fig. 25 Watercolour (17 May 1761) of the pompom tree (*Dais* sp.; Thymelaeaceae) by Nicolaas Meerburg in the ‘album amicorum’ (book of friends) of the Dutch naturalist Johannes le Francq van Berkhey (1729–1812). National Library of The Netherlands, The Hague (KW 132 F 13).

<sup>47</sup> A source for which species were present in the ‘Van Royen herbarium’ around 1850 is a copy of Steudel’s *Nomenclator Botanicus* (1821–1824), in the botanical library of Naturalis. Herein Julius Hermann Schultes (1820–1887), the son of J.A. Schultes noted the origin or collector of all species that were present in the Rijksherbarium. A major task of the director of the Rijksherbarium was preparing a catalogue of all herbarium specimens (Goethart 1931: 49, Van Steenis 1989: 17). Apparently, this task Blume had assigned to Schultes, who was his assistant from 1843 to 1852 (Stafleu & Cowan 1985, Vol 5: 368), though Van Steenis-Kruseman (1979: 38) noted that in 1846, at least, Schultes was appointed on a temporary basis.

<sup>48</sup> Letter D. van Royen (20 March 1769) to Linnaeus (Linnaean correspondence L4193).





**Fig. 26** Specimen of *Callicarpa americana* L. (L 0141948; *Lamiaceae*) from the herbarium of Johan Frederik Gronovius, which he had received from William Sherard. On this sheet there are three different hands; Gronovius sr. (*Viburnum* s. *camara*), his son Laurens Theodorus (the text at the bottom) and also Nicolaas Meerburg (*Callicarpa americana* Linn. Sp.). Because also Meerburg's handwriting is present, this must be one of the Gronovius specimens that Meerburg had acquired.

considering the above, specimens with the handwriting of J.F. Gronovius, on which also Meerburg's handwriting appears must in fact have come from Meerburg's herbarium. This also applies to those specimens which one could attribute to Clifford because of the presence of the typical labels that were designed for him (Thijsse 2018: 143). These labels, however, show the handwriting of Gronovius and must have come also from Gronovius's herbarium (Fig. 28). Perhaps all the herbarium specimens that clearly once formed part of the Gronovius herbarium should be considered as originating from the herbarium of Meerburg. To complicate matters further, together with the specimens of Gronovius, Meerburg also seems to have come into possession of a substantial number of specimens from the herbarium of Albinus (Fig. 29).

#### Herbarium specimen ornamentations

Many of the plants that could be ascribed to Adriaan van Royen are mounted on the sheet with vases and ribbons. In total six different kinds of vases have been encountered (Fig. 30). Two of them, Fig. 30a, b, are possibly from a print with ornaments



**Fig. 27** *Hypericum gentianoides* (L.) Britton, Sterns & Poggenb. (L 0140728; *Hypericaceae*). The top handwriting is that of Johan Frederik Gronovius, that in the middle is of Laurens Theodorus Gronovius and the bottom handwriting is that of David van Royen.



**Fig. 28** Specimen of *Podalyria myrtillifolia* (Retz.) Willd. (L 0144806; *Fabaceae*) in the herbarium of Nicolaas Meerburg mounted with a vase of type e in Fig. 30 showing the monogram JFG. The text on the label, which is considered to be designed for George Clifford, was written by Johan Frederik Gronovius. The crossed-out reference was written by his son Laurens Theodorus. The name *Sophora biflora* (now *Podalyria biflora* (L.) Lam.), written by Nicolaas Meerburg, was published in 1759 in the 10th edition of Linnaeus's *Systema Naturae*.

that was designed especially for Adriaan. Three of the others, Fig. 30c, d, e, are also found on specimens in the herbaria of Clifford and Gronovius and on Gronovius's specimens in the herbarium of Meerburg. The dates of the earliest of the dateable specimens with one of these three vases range from 1727 to 1732 (Thijsse 2021: 270, 271, f. 17). It is probable that the production date of these vases was not long before the earliest date (1727).

The vase Fig. 30e has a monogram that was thought to be composed of the letters AVR (Adriaan van Royen) and there-





**Fig. 29** Specimen of *Laserpitium latifolium* L. (L 0076582; Apiaceae) from Bernard Siegfried Albinus in the herbarium of Nicolaas Meerburg mounted with a vase of type f in Fig. 30 that has an engraved shadow at the base.

fore might have been designed specifically for him (Wijnands & Heniger 1991: 137, Thijsse 2018: 141). In fact, the monogram is formed out of Gronovius's initials, JFG (Fig. 31), which makes it more probable that this model of a vase, and maybe the vases Fig. 30c and d (Fig. 30) as well, were commissioned by Gronovius (Thijsse 2021: 271). A ribbon with a tassel at each end is also thought to have been designed for him (Fig. 32).

It was Wijnands (1992: 18), who suggested that such vases and other ornaments were designed for individual owners of herbaria as a mark of ownership (just as ex libris labels are used in book collections), and therefore could be used to identify the original owner of a herbarium specimen. It is therefore not inconceivable that all the specimens in the 'Van Royen herbarium' with the vase with Gronovius's monogram could have come from the elder Gronovius. To conclude anything definitive on this, an extensive analysis of all specimens with this vase is necessary.

By far the most common vase in the 'Van Royen herbarium' is type Fig. 30f. This kind of vase also appears regularly on Clayton's specimens from the herbarium of Gronovius (BM). Another version of the same design, which differs only in detail and better print quality, is the most often used kind of vase used in Clifford's herbarium (BM). This kind of vase seems to be absent from the collections of the Van Royens and Meerburg and is one of the vases that were probably designed especially for Clifford (Fig. 33).

Of both versions examples are found that show an engraved shadow at the base of the vase. Vases of type Fig. 30f with such a shadow are found often on specimens showing only the handwriting of Meerburg (Fig. 34) and on specimens originating from J.F. Gronovius (Fig. 35) and Albinus (Fig. 29). The version of vase Fig. 33j with a shadow has been found only once (Fig. 36). Since there are both versions of this vase with, and without shadow, it is now impossible in most cases to determine with certainty which version was used, as one can never be sure that the shadow has not been cut away.

Of the ornament print(s) that must have been produced for Adriaan van Royen, no complete copies are known. In contrast, of an ornament print designed for David van Royen, a large number of complete prints and cut out vases and ribbons have been preserved in Naturalis (Fig. 37). That these had been produced for David is clear from the accompanying note, pos-



**Fig. 30** Six types of vases that are encountered on the herbarium specimens of Adriaan van Royen. The monogram JFG on vase e stands for Johan Frederik Gronovius (see Fig. 31).





**Fig. 31** Vase e (Fig. 30) with a mirror monogram of the initials JFG which stands for Johan Frederik Gronovius. (Naturalis). Colouring added by Ingrid de Kort.

sibly made when his uncle Adriaan had passed his herbarium to him around the time that he succeeded him as director of the Leiden botanical garden in 1754. In this note he wrote:

'Uitgeknipte potjes en lindtjes tot mijn herbarius. De twee hier tzaamen gebonden eykeplankjes hebben gediend om de boekjes van cardoespapier voor mijn herbarius naar te laten afsnijden. Tusschen de plankjes vind men de linealen die gediend hebben om te bepalen t' midden van t' vlak ten einde de spiegeltjes welte plakken, – en om in de rug opgelijke hoogtens en wijtens de draden door te steken'

**Translation.** 'Cut-out vases and ribbons for my herbarium. The two, tied together, small oak boards served to cut to size the cardstock paper folders for my herbarium. Between the boards you will find the rulers which have served to determine the centre of the sheet where to glue the mirrors, and to stitch the threads in the spine at identical height and width'.

These 'mirrors' are the large cartouches that figure not only on these prints in Leiden, but also a single copy (Inv. nr. 28584.4) at the Victoria and Albert Museum in London and were used for labels. At Naturalis there are also prints on which such a cartouche is printed separately. So far, in the 'Van Royen herbarium', only one plant which was received from the Cape in 1764, i.e., a collection of *Pelargonium hermanniifolium* (P.J.Bergius) Jacq. (L 0100233; *Geraniaceae*) has been found mounted with one of the kinds of vases from this print.

Both the prints at Naturalis (Fig. 37) and that in the Victoria and Albert Museum (Fig. 38) are signed by the Leiden painter Hieronymus van der Mij (1687–1761) and the Leiden engraver Johannes van der Spyk (1696–1763). The designs of the



**Fig. 32** Specimen of *Euphorbia amygdaloides* L. (L 0140286; *Euphorbiaceae*) in the herbarium of Nicolaas Meerburg. The plant is mounted with a ribbon with a tassel at both ends as is often found on the specimens of Johan Frederik Gronovius.

vases closely resemble in style and design that of the vases Fig. 30d, e and f and are probably his design as well. The print in the Victoria and Albert Museum is clearly an earlier version of that at Naturalis (Thijssse 2021: 269). Vases of this print have not been found on the specimens of Adriaan van Royen or on that of Clifford and it is therefore improbable that one of



**Fig. 33** Four types of vases that were probably commissioned by George Clifford. (Naturalis).





**Fig. 34** Specimen of *Ramonda myconi* (L.) Rchb. (L 0142902; *Gesneriaceae*) from the herbarium of Nicolaas Meerburg mounted in a vase of type f (Fig. 30), but with a shadow at the base.



**Fig. 35** '*Blitum spica viridi crassa*' (= *Amaranthus polygonoides* L., L 0223060; *Amaranthaceae*). Johan Frederik Gronovius received this specimen from William Sherard in 1727 ('Ex horto di Sherard 1727'). It is mounted in a vase of type f (Fig. 30), but with a shadow at the base.

them commissioned them. Because of the similarity with the vase showing a portrait in the cartouche and the vase bearing Gronovius's monogram, it has been suggested that these were made for him (Thijssse 2021: 269). One of the labels on the print in the Victoria and Albert Museum stands out because of its asymmetrical design and position on the sheets, while all other ornaments are symmetrical. It is therefore not unthinkable that this label is a later addition and that an earlier version of this print once existed.

## SCIENTIFIC SIGNIFICANCE

The full scientific significance of the 'composite' 'Van Royen herbarium' can only be fully assessed after a thorough study of all individual specimens. This is obviously beyond the scope of this paper. Here we focus on the presence of type specimens of Linnaean and other plant names in the 'Van Royen herbarium', and briefly dwell on the significance of the 'Van Royen herbarium' as evidence of the international role of Leiden botany in the 18th century.

The typification of Linnaean names is described by Jarvis as a six-step process (Jarvis 2007: 37–38). In cases where no explicit specimens are cited (step 1) and no specimens that can serve as types are present in Linnaeus's own herbarium (LINN), or the Linnaean herbaria at, e.g., G, MW, S, SBT, UPS

(step 2), one has to search the herbaria that are associated with the synonyms mentioned by Linnaeus (step 3). Principal among these are the herbaria linked with publications such as Linnaeus's *Hortus Cliffortianus* (Linnaeus 1738), Gronovius's *Flora Virginica* (Gronovius 1739–1743) and Van Royen's *Florae Leydensis Prodrum* (A. van Royen 1740). Therefore, for the typification of Linnaean names, the specimens from Adriaan van Royen's garden herbarium (Lot 3) are especially important, as already noted by Wijnands (1983: 28–29).

Adriaan van Royen is to be considered the author or 'ex' authority of seven generic names published in Linnaeus's works as these are based on descriptions Adriaan sent to Linnaeus or, at least names in his MSS or publications (for nomenclatural purposes Linnaeus (1753) and (1754) are considered to have been published simultaneously, entries in both therefore making up the protologue, there being no generic descriptions in Linnaeus (1753)):

*Acalypha* Royen ex L. (Linnaeus 1753: 1003, 1754: 436; *Euphorbiaceae*). This name was first used by Linnaeus in 1737 (Linnaeus 1737a: 19) who added 'autore Cl. Royeno', but in 1754 merely 'Roy.', i.e., the name, but not the description, to be attributed to A. van Royen.

*Adenantha* Royen ex L. (Linnaeus 1753: 384, 1754: 181; *Fabaceae*). This name was first used by Linnaeus (1737a: 7)





**Fig. 36** Specimen of *Tordylium officinale* L. (L 0141315; *Apiaceae*) from the herbarium of Johan Frederik Gronovius that is mounted with a vase of type j (Fig. 33), but with a shadow at the base.

'authore Cl. Royeno' [sic], but in both 1753 and 1754 he wrote merely 'Roy. Lugdbat. p. 462'.

*Chionanthus* Royen (Linnaeus 1753: 8, 1754: 9; *Oleaceae*). Linnaeus (1754: 9) wrote 'Authore Cl. Royenio [sic]'.

*Cyanella* Royen (Linnaeus 1754: 149; *Tecophilaeaceae*). Linnaeus wrote 'Auctore Clar. Royeno [sic]'.

*Dactylis* Royen ex L. (Linnaeus 1753: 71, 1754: 32; *Gramineae*). Linnaeus (1754: 32) attributed the name, but not the description, to A. van Royen ('Roy. Lugdbat. 56').

*Lachnaea* Royen ex L. (Linnaeus 1753: 560, 1754: 169, *Thymelaeaceae*). In 1754 Linnaeus (Linnaeus 1754: 169) attributed the name, but not the description to A. van Royen ('Roy.').

*Psoralea* Royen ex L. (Linnaeus 1753: 762, 1754: 336 '*Psoralea*'; *Fabaceae*). Linnaeus (1754: 336) attributed the name, but not the description, to A. van Royen ('Roy. Lugdbat. 372').

From 1759 onwards, David van Royen provided Linnaeus with seeds, living plants and herbarium specimens of rare or new plants, especially of new material he had received from South Africa and Sri Lanka.<sup>49</sup> On the basis of these materials and David's observations (read descriptions), Linnaeus described six new genera (correctly to be attributed to David van Royen), five with one species, namely *Codon* D. Royen (Linnaeus 1767a: 292; *Boraginaceae*) 'Authore Cl. David Royeno' with *C. royenii* L. 'Roy Mss'; *Cunila* D. Royen (Linnaeus 1759: 1359; *Lami-*

*aceae*) 'Authore Cl. Royeno' with *C. mariana* L. (now *C. origanoides* (L.) Britton); *Dais* D. Royen (Linnaeus 1762–1763: 556; *Thymelaeaceae*) 'D. van Royen' with *D. cotinifolia* L.; *Pedaliium* D. Royen (Linnaeus 1759: 1375; *Pedaliaceae*) 'Authore Cl. David Royeno' with *P. murex* L. (Linnaeus 1759: 1123) 'misit D. Dav. v. Royen' (Fig. 39); *Schwenckia* D. Royen ex L. (Linnaeus 1764: 577; *Solanaceae*) 'Dav. van Royen' with *S. americana* L.; and *Leea* D. Royen (Linnaeus 1767b: 17, 124; *Vitaceae*) 'Authore D. Dav. Royeno' with two species *L. aequata* L. and *L. crispa* L. (now *L. asiatica* (L.) Ridsdale).

For all species in a long list with 100 observations and questions David van Royen sent to Linnaeus on 7 June 1763 he added a herbarium specimen.<sup>50</sup> Therefore, all those specimens should still be present in both Linnaeus's own herbarium and duplicates in the 'Van Royen herbarium'. An example of David's specimens used directly by Linnaeus himself and preserved at LINN (Linn. Herb. 998.11) is *Solidago lanceolata* L. (Linnaeus 1767b: 114; *Asteraceae*), now *Euthamia nuttallii* Greene, with L 0144108 being a duplicate specimen retained in the 'Van Royen Herbarium'. On the label of that specimen David refers to his letter of [7 June] 1763 to Linnaeus and to Linnaeus's answer written on 26 December 1763 (Fig. 40).<sup>51</sup> Other specimens in the 'Van Royen herbarium' with labels on which David refers to his correspondence with Linnaeus are also duplicates of those he sent to Linnaeus in 1763 – see Jarvis (2007: 226) for further discussion.

Type material of at least 18 of the new taxa published by Joseph Gaertner (1732–1791) in *De fructibus et seminibus plantarum* (1788, 1791) are among the carpological specimens associated with the 'Van Royen Herbarium' at L, making this an important part of the scientific significance of the 'Van Royen herbarium' (Appendix 4). Gaertner's own collection of fruits and seeds is (at least for the greater part) at the Institut für spezielle Botanik und Pharmakognosie der Universität Tübingen (TUB) (Staffeu 1969: 217, 221). Gaertner was a former student and friend of David van Royen and became professor of botany in St. Petersburg. In 1778 he was in Leiden to study the fruits and seeds in the collections of the Van Royens. Here he found many, mainly from the East Indies, that were new to him and of which he was allowed to take home representative specimens (Staffeu 1969: 217).

Through donations and purchases of herbarium material at auctions, the 'Van Royen herbarium' contains a variety of original material from several important contemporaries and earlier authors and collectors. There are for instance Japanese plants collected by Thunberg (dated 1777) that are duplicates of the specimens he used for his *Flora Japonica* (Thunberg 1784); a large number of Von Haller's (c. 250) specimens, among which are many mosses, which probably relate to his *Enumeratio methodica* (Von Haller 1742). There is a large set of Vaillant specimens (370) and a hitherto unknown number of De Tournefort specimens among which are probably the only remaining authentic specimens of new species published in his *Corollarium* (De Tournefort 1703). The specimens in the Van Royen herbarium collected in Sri Lanka and at the Cape of Good Hope prove to be of much greater importance than

<sup>49</sup> See the correspondence between D. van Royen and Linnaeus (L3269, L3338, L3874, L3892).

<sup>50</sup> 'Centuria observationum et quaestionum botanicarum' (100 observations and questions regarding botany). The last observation on the last folio is dated 28 May (The Linnaean Collections (GB-110/LM/MA/ROY/1). Sent by D. van Royen with his letter of 7 June 1763 to Linnaeus (Linnaean correspondence L3269).

<sup>51</sup> Letter D. van Royen (7 June 1763) to Linnaeus (Linnaean correspondence L3269) and Linnaeus's letter (26 December 1763) to D. van Royen (Linnaean correspondence L3338).





**Fig. 37** Ornament print with designs by the Leiden painter Hieronymus van der Mij that was produced for David van Royen. The engraving was by Johannes van der Spyk (Naturalis archives).



**Fig. 38** Ornament print at the Victoria and Albert Museum in London. This print is an earlier version of those at Naturalis (copyright Victoria and Albert Museum, London. Inv. nr. 28584.4).



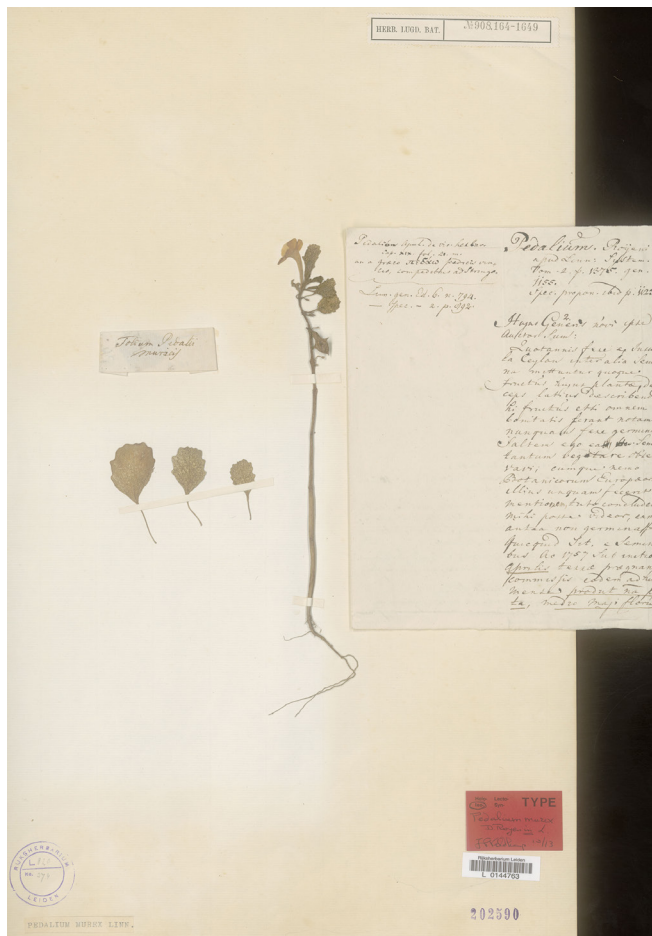


Fig. 39 *Pedalium murex* L. (L 0144763; *Pedaliaceae*) with a four-page description by David van Royen. This specimen is probably a duplicate of a herbarium specimen David had sent to Linnaeus.

hitherto thought. Some König specimens may well be isotypes of species names coined by Linnaeus, Anders Jahan Retzius (1742–1821), William Roxburgh (1751–1815), Albrecht Wilhelm Roth (1757–1834) and others (Jarvis 2007: 207). For example, it seems that the abovementioned *Hunteria zeylanica* (Retz.) Thwaites (L 0053037) is such a case. It has also become clear here that a still unknown number of plants from the Cape must have been collected by Thunberg, whether or not with Auge, and sent by Tulbagh to David van Royen. To be able to determine how much original material (and of which species) is in the König collections and to be able to attribute Cape plants with (more) certainty to Thunberg and/or Auge, further research is needed. It is likely that, once such intensive work has been done, the significance of the 'Van Royen' herbarium will even be greater than what we have been able to point up in this paper.

#### The 'Van Royen herbarium' and botanical networks in the 18th century

The plant collections in the 'Van Royen herbarium' were assembled during the formative years of systematic botany and Linnaean taxonomy (Stafleu 1971: 9) in and around the Leiden botanical garden, which at that time was an internationally acknowledged centre of botanical excellence (Stearn 1961). This generalisation is supported by an analysis of the list of contributors to both Adriaan's and David's herbarium, and of their correspondents. They include many great names in English, French, German, Italian, Russian, Spanish, Swedish, and Swiss botany of the day, to a high degree overlapping with Linnaeus's own network from which he obtained plants, literature and correspondence that informed his *Species plantarum* and other publications. Of the contributors and correspondents of

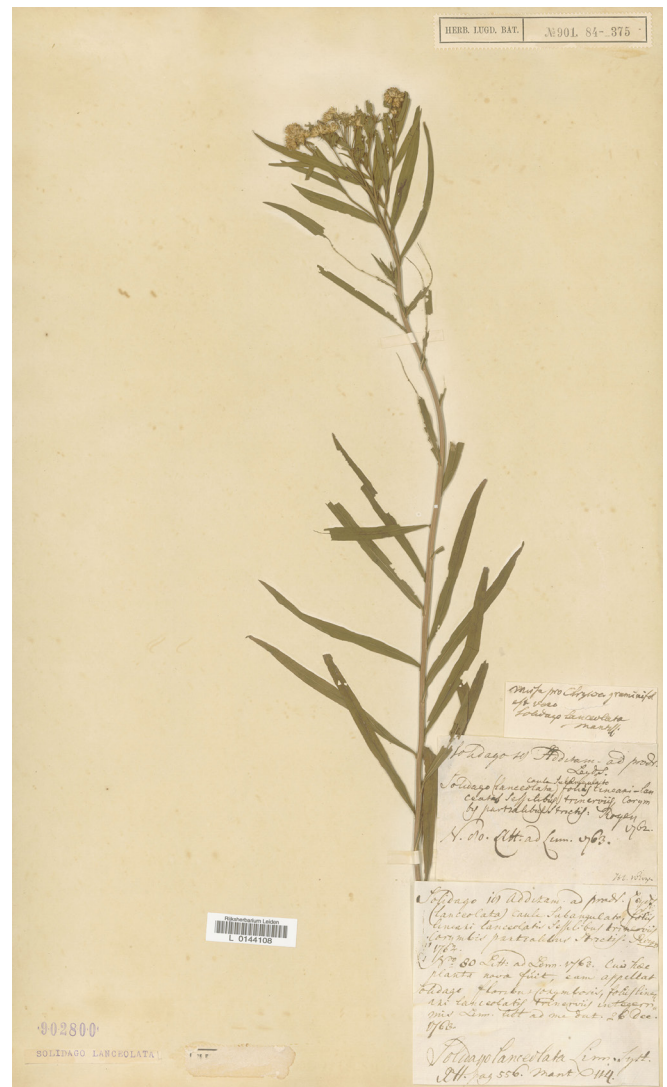


Fig. 40 *Solidago lanceolata* L. (L 0144108; *Asteraceae*), now *Euthamia nuttallii* Greene, probably a duplicate specimen retained in the 'Van Royen Herbarium' of a specimen used directly by Linnaeus himself (Linn. Herb. 998.11). On the label David refers to his letter of (7 June) 1763 to Linnaeus and to Linnaeus's answer written on 26 December 1763. He also noted that this species was not in *Prodromus* (A. van Royen 1740) and that he had added it to it ('Additum ad prod. Leyds').

the Van Royens, enumerated in this paper, over 25 figure in Jarvis's (2007) list of authors and collectors who were important for Linnaeus.

#### CONCLUDING REMARKS

In this paper we have attempted to present an overview of the 'Van Royen herbarium', which was assembled from many sources by uncle and nephew Adriaan and David van Royen between 1729 and 1799. Because of many changes in curatorial practice of the initially privately owned herbarium, later of the Academy herbarium in the Leiden botanical garden, and subsequently in the Rijksherbarium, the herbarium specimens became fully integrated and submerged in the general herbarium in the preparation for the move to Nonnensteeg 1 in 1911–1913 when it was decided to arrange the herbarium by taxonomic and phytogeographical affiliation only. Thus the 'Van Royen herbarium' lost its character as a coherent entity. That entity comprised and was limited to the seven lots of dried plants described and auctioned a year after David van Royen's death (Anonymous 1800).

Only after Cornelis Kalkman's (1983) decision to separate the historical pre-1800 collections in Leiden from the main herbarium a process was begun to restore the 'Van Royen herbarium' as a biohistorically and botanically interesting and important entity. Important milestones in that process were the recording of the herbarium on microfiche in 1998 (Baas 1998, Thijsse 1998–2002, Thijsse & Veldkamp 2003), the digitisation of the Van Royen (in 2018) and Meerburg herbarium (20??), and this paper, which analyses the composite nature of the herbarium, as well as its partial overlap with the herbarium of Meerburg, through shared specimens originally in the Gronovius herbaria. Revealing and inventorying the 'Van Royen herbarium' has been a bit like creating 'order out of chaos', to plagiarise the title of the mammoth task carried out by Jarvis (2007) and co-workers to lectotypify most Linnaean names. Interestingly, that project found that c. 90 specimens of Adriaan van Royen's herbarium qualify as lectotypes of Linnaean names, and a further 35 as original materials for such species names, testifying to the nomenclatural importance of the original 'Van Royen herbarium'. Our survey has revealed many interesting national and international links and networks that behove further detailed studies of all plant specimens in the 'Van Royen herbarium' and of hitherto underexplored archives concerning the many botanists who contributed to the Van Royens' collections, and who helped to shape the emergence of plant taxonomy in and around Leiden in the 18th century. Detailed studies of such as the Breyne specimens (De Jong et al. 2022) and Boerhaave (Offerhaus et al. 2022) are to be welcomed.

**Acknowledgements** We thank the reviewers Charlie Jarvis (Research Associate, Natural History Museum, London) and Marc Sosef (Senior Researcher, Meise Botanic Garden) for taking the time and trouble necessary to review the manuscript; we sincerely appreciate their valuable comments and suggestions, which helped us to improve the quality of this paper. Folkert van Straten (former lecturer in Classical Archaeology, Leiden University) is thanked here for translating the most problematic Latin texts as is Ingrid de Kort for making and preparing many of the figures. Susanne Dietel (Leipzig University Library) provided digital images and information of the Leipzig copy of *Ericetum Africanum* while Esther García Guillén (Curator of the Historical Archives Royal Botanical Garden, CSIC), sent digital copies of David van Royen's correspondence with C. Gómez-de Ortega. We also thank John H. Wiersema (Research Associate, Department of Botany, Smithsonian Institution Washington) for information on the attribution of generic names to Adriaan van Royen. Last but not least, we thank the staff of Naturalis library and collection management for their assistance during the many years preceding the writing of the final version of this paper.

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## APPENDIX 1 – Biographical notes on Adriaan van Royen

Adriaan van Royen was born in Leiden on 11 November 1704 as the third child of Johan Davidsz. Van Royen (1675–1719) and his second wife Cornelia van Groenendijk (1672–1732). He studied botany and medicine in Leiden under Boerhaave and Albinus (Suringar 1866: 260) and graduated with a dissertation on plant physiology in 1728 (A. van Royen 1728, Reveil et al. 1871: 174). Shortly after his doctorate he made a trip to England and France. In London Adriaan was elected Fellow of the Royal Society on the recommendation of Hans Sloane (1660–1753), Francis Clifton (?–1736) and John Caspar Scheuchzer (1702–1729). Later, he also became a member of the botanical society in Firenze (Brender à Brandis 1786: 5; <https://royalsociety.org/>). Adriaan settled in Leiden as a physician, but worked in that capacity for less than a year (Suringar 1866: 260).

In February 1729, Boerhaave recommended Adriaan van Royen, who had already assisted him voluntarily in the preparation of lectures and demonstrations in these fields, as his successor as professor of botany and chemistry. The curators of the university, however, decided to appoint him for the time being only as reader in botany (Molhuysen 1921, Vol 5: 69–71). In May 1729 he held his inaugural lecture about the pleasure, benefit and necessity of botanical knowledge for the practitioners of medicine (A. van Royen 1729).

Considering that the correspondence with all the famous university gardens and other well established gardens, in order to enrich the Leiden botanical garden with new species, required a considerable amount of specific knowledge and long experience, Boerhaave was asked to continue this correspondence and the supervision of the garden (Molhuysen 1921, Vol. 5: 71). Adriaan was probably not at all unhappy about this arrangement. At the end of May 1729 he wrote to Boerhaave's cousin, Abraham Kaau (1705–1753) that he found teaching already demanding enough. After six lectures on the botanical system, he was looking forward to his holidays around the Leiden 'Kermis', a festivity celebrating the consecration of the Pieterskerk held on the first Sunday after Ascension Day (Heussen 1744: 182, Kooijmans 2011: 244). After working for a year under Boerhaave's wing, Adriaan van Royen was appointed professor of botany and medicine in 1732, and also became director of the Leiden botanical garden. His inaugural oration, in which he discussed the discovery of the reproductive function of the stamens and pistils in flowers, was written as an elegiac verse in Latin (A. van Royen 1732). This not only earned him international recognition for his botanical work, but also for his poetry (Haskell 2013: 71).

In October 1734 Adriaan van Royen married Adriana Johanna Wesselius (1705–1769), the only daughter of the Leiden theology professor Johannes Wesselius (1671–1745). Together they had four sons; Jan van Royen (born 27 January 1736), Herman Johan van Royen (24 August 1737–22 November 1739), Rippert van Royen (born 1 August 1739) and Herman Johan van Royen (born 8 January 1747) (Brender à Brandis 1786: 7).

On 1 February 1736, Adriaan van Royen was appointed secretary of the Senate of Leiden University (Brender à Brandis

Wijnands DO. 1983. The botany of the Commelins. A taxonomical, nomenclatural and historical account of the plants depicted in the Moninckx Atlas and in the four books by Jan and Caspar Commelin on the plants in the Hortus Medicus Amstelodamensis 1682–1710. Balkema, Rotterdam.  
 Wijnands DO. 1992. Tuinvazen voor herbaria. *Origine* 4: 18.  
 Wijnands DO, Heniger J. 1991. The origin of Clifford's herbarium. *Botanical Journal of the Linnean Society* 106: 129–146.  
 Wijnands DO, Zevenhuizen EJA, Heniger J. 1994. Een sieraad voor de stad: de Amsterdamse Hortus Botanicus, 1638–1993. Amsterdam University Press, Amsterdam.

1786: 8). He held the position of Rector Magnificus no fewer than three times: 1742/1743, again in 1758/1759 and for the last time in 1770/1771 (Du Rieu 1875: XXXI). From 1745, he was also praeses of the 'Collegium Pharmaceuticum', and from 1746 head of the Latin school (Anonymous 1745: 31, 1746: 31, 48, Suringar 1866: 291).

To honour Adriaan van Royen, Linnaeus named a new plant genus, *Royena* L. (now considered a synonym of *Diospyros* L.; *Ebenaceae*) and two new species, *Conium royenii* L. (now *Caucalis platycarpus* L.; *Apiaceae*) and *Cactus royenii* L. (now *Pilosocereus royenii* (L.) Byles & G.D.Rowley; *Cactaceae*), after him in *Species Plantarum* (1753: 243, 397, 467). In his *De Officio Medici* (the duties of the Doctor), Heerkens (1752: 32) gently chided Adriaan for fawning on Linnaeus by aspiring to be remembered in the name of a plant, rather than for his poetry (Haskell 2013: 75 note 15).

In 1754 Adriaan resigned as professor of botany and was succeeded by his nephew David van Royen (Veendorp & Baas Becking 1938: 117). The chair in medicine he held until 1755 lecturing on chronic diseases (Suringar 1866: 263). In 1775 Adriaan van Royen was granted discharge at his own request, because of his advanced age and more than 40 years of service (Molhuysen 1923, Vol. 6: 147). Unfortunately, he could not enjoy his retirement for long. In February 1778, when reaching for a book from one of the higher shelves in his library, the latch of the stepladder, which was only a few steps high, came loose. In his fall, Adriaan broke his thigh bone and never fully recovered. He died in February 1779, from the effects of oedema (Brender à Brandis 1786: 13–15). In his memory, four poems were published (Hengevelt 1779, Van Hoogeveen 1779, Le Pla 1779, Terpstra 1779).

## Teaching

From his appointment as reader in botany on 9 May 1729 onwards, Adriaan van Royen lectured for 25 years on the names and medicinal properties of the plants in the Leiden botanical garden. In his diary, the Scottish student John Boswell (1710–1780), who stayed in Leiden for three years and graduated in 1736, wrote that Adriaan and he were in the botanical garden at seven o'clock in the morning and between four and five o'clock in the afternoon. On Monday, Tuesday, Thursday and Friday, there were 'pleasant and useful' lectures on medicinal plants (Korst 2003: 51–52).<sup>52</sup> On Fridays and Saturdays, Adriaan gave private lectures on the 'Materia Medica'. These yielded welcome additions to a professor's salary, which may explain why in July 1734 he had Leiden University forbid the physician and pharmacist Gerard van Swieten (1700–1772) to give such lessons as well (Molhuysen 1921, Vol. 5: 137, Korst 2003: 51–52).

Because Adriaan van Royen quoted Boerhaave so often, Boswell doubted whether he was really all that learned (Van Strien 1995: 2689, 1996: 133). The reason for this must have been

<sup>52</sup> Written notes of Adriaan van Royen's lectures of 1749/1750 ('Dictata in Materiam Medicam' 1749/1750) are preserved in the library of Leiden University (Special collections BPL 1498).



that the garden was still arranged according to Boerhaave's system at that time. However, plans to expand the garden and redesign it according to Linnaeus's new system were already at an advanced stage. Upon Boerhaave's death in 1738, Adriaan was requested to take over the courses in practical medicine as well, while Gaubius would lecture on theoretical medicine.<sup>53</sup> This arrangement would last only for a short time, because, at the request of some English students, Adriaan's lectures in practical medicine were also taken over by Gaubius.<sup>54</sup> Adriaan's lessons were also criticised by the German botanist David Sigismund August Büttner (1724–1768).<sup>55</sup> On the other hand, if the words of J.F. Jacquin are to be believed, his father N.J. Jacquin, who began his studies in Leiden in 1741 (Du Rieu 1875: 986) decided to devote his life to botany after listening to Adriaan van Royen in the Leiden botanical garden explaining the structure of the flower of *Hellenia speciosa* (J.Koenig) S.R.Dutta (Madríñán 2013: 7–8). However, it must be pointed out that it is also recorded that it was his fellow student and friend L.T. Gronovius who had inspired N.J. Jacquin's choice of study (Sartori 1819: 327).

### Florae Leydensis Prodromus

One of the manuscripts Linnaeus had brought with him when he came to The Netherlands in June 1735 was that of the *Systema Naturae* (Stearn 1957: 9), wherein he divided nature into three kingdoms: animals, minerals and plants. The flowering plants were grouped according to the number of stamens and pistils in the flowers. With the forthcoming enlargement of the Leiden botanical garden, Linnaeus with his new ideas of classification of all plants could not have arrived at a better time and Adriaan van Royen must have decided almost immediately to lay out the new garden according to Linnaeus's system. The plans for the enlargement of the garden had been ready since 1730, but it would still be another ten months before these plans were implemented. In April 1736, tenders were opened for constructing the wall around the new garden. The first stone was laid on 25 June 1736. It bears the name of Adriaan van Royen's first son Jan, who then was five months old (Brender à Brandis 1786: 10). The start of the reorganisation of the garden may also have been the reason for Adriaan to commission Laurens van der Vinne (1712–1742) to paint a flower still-life for the official residence (Fig. 41).

Exactly when the enlargement of the garden was fully completed is not known. On 22 July 1738, the elder Gronovius wrote to Richardson that the garden had been expanded as far as the ramparts, but that no one was allowed access (Smith 1821: 172–173). By December 1739, the rearrangement of plants according to Linnaeus' system had been realised and, at least by then, the work on the new garden must have been finished.<sup>56</sup>

When Linnaeus arrived in Leiden on 9 October 1737, to say farewell, on his way back to Sweden, Adriaan van Royen was working on a new catalogue of the plants growing in the Leiden botanical garden.<sup>57</sup> Although Linnaeus wanted to return to Sweden as soon as possible, Adriaan managed to persuade him to stay for some time to help him organise the Leiden botanical garden according to his new system. Together they gave the plants new names and designed a new lay-out for the garden



**Fig. 41** Fantasy landscape with plants from the Cape. Oil painting on canvas by Jan Laurensz. van der Vinne (1699–1753). It was commissioned by Adriaan van Royen in 1736 or 1737 and originally decorated a mantelpiece in his official residence (Museum Boerhaave, Leiden, P02657).

(Linnaeus 1826: 30–31). Linnaeus, who did not want to offend his benefactor, was reluctant to replace Boerhaave's system with his own. Nevertheless, he felt obliged to help Adriaan and assisted him to devise a taxonomic system of his own (Linnaeus 1826: 30–31). This became the 'Methodi naturalis praeludium', published in *Prodromus*.

Linnaeus hoped that his delay in Leiden would not be too long.<sup>58</sup> He expected to leave in February 1738, but at the end of January he fell severely ill and had to stay in bed for six weeks. In March he was well enough to return to Clifford's 'Hartekamp' to regain his strength and in May he left The Netherlands (De Gorter 1778: 127, Gistel 1873: 111, Jackson 1923: 166).<sup>59</sup> So, effectively his time spent in Leiden lasted less than four months. Apart from aiding Adriaan van Royen, Linnaeus was with Gronovius daily, helping him with the writing of *Flora virginica* (Pulteney 1805: 531).<sup>60</sup> Obviously, then, Linnaeus could not have given Adriaan his undivided attention and, when he left Leiden in March 1738, there was no finished manuscript for a new garden catalogue.

On 8 January 1739 Adriaan van Royen wrote to Linnaeus that he could not find the time to devote to his beloved botany be-

<sup>53</sup> Letter J.F. Gronovius (Leiden, 17 March 1739) to Linnaeus (Linnaean correspondence L0278).

<sup>54</sup> Letter J.G. Seeger (Leiden, 20 January 1739) to Linnaeus (Linnaean correspondence L0268).

<sup>55</sup> Letter D.S.A. Büttner (Leiden, 5 October 1748) to A. von Haller, Editions- und Forschungsplattform hallerNet, <https://haller.net.org/data/letter/00764>.

<sup>56</sup> Letter J.P. Breyne (23 December 1739) to Linnaeus (Linnaean correspondence L0311).

<sup>57</sup> Letter Linnaeus (8 October 1737) to A. von Haller (Linnaean correspondence L0216).

<sup>58</sup> Letter Linnaeus (8 October 1737) to A. von Haller (Linnaean correspondence L0216).

<sup>59</sup> Letter Linnaeus (March 1738) to A. von Haller (Linnaean correspondence L0243).

<sup>60</sup> Whether Linnaeus always stayed at one and the same address during his stay in Leiden in 1737/1738 is not clear. He himself wrote to Von Haller (Stockholm, 23 September 1739) that he stayed with Adriaan van Royen in 1738.

cause of all his other activities. He was also pre-occupied by a very disconcerting academic feud with a person he thought of as his friend. It had caused him heartache and anxiety, making it impossible for him to even think of publishing a flora of Leiden.<sup>61</sup> He therefore had decided to publish what he had written so far as a precursor (i.e., *Prodromus*; A. van Royen 1740).<sup>62</sup>

Stoeve (1794: 102) wrote that *Prodromus* was not the work of Adriaan van Royen, but was by Linnaeus. His source may be what he wrote to Linnaeus on 11 January 1739, namely that it was 'tota tua est' (= it is all yours), after he had read the *Prodromus* [the manuscript?] he had received from Adriaan, but perhaps he meant only that it was fully in accordance with Linnaeus's ideas on plant classification.<sup>63</sup> Wijnands (1983: 28–29) wrote that there is every reason to assume that Linnaeus had contributed substantially to *Prodromus*, and considered it 'as close as anything to a joint work of Adriaan van Royen and Linnaeus'. He estimated that the number of Adriaan van Royen's specimens that may be relevant for the typification of Linnaean names could be as high as 2000–3000. These figures he probably based on the number of times *Prodromus* is cited in the first edition of *Species Plantarum* (c. 2000) and the number of taxa included in *Prodromus* (c. 3000).

It is almost impossible that the text for *Prodromus* could have been finished before Linnaeus left Leiden. Apart from giving the plants new names together (Linnaeus 1826: 30–31), it is more probable that the text was written by Adriaan van Royen himself. Linnaeus's contribution was probably limited to formulating the new classification system. In the system Adriaan's influence is obvious, because it is less artificial than that of Linnaeus. According to Stafleu (1971: 161) Adriaan was a major advocate of Linnaeus's ideas, but first and foremost of his views on generic delimitation and nomenclature, not of his artificial classification system (Stafleu 1971: 161). In contradiction with this is what Linnaeus wrote (1 May 1737) to Von Haller, namely that, except for himself, nobody in The Netherlands cared about genera. Gronovius, Burman and Adriaan van Royen were only interested in herbarium specimens, although Adriaan was now beginning to look into this subject.<sup>64</sup> Gronovius, on the other hand, wrote at about the same time (8 February 1737) to Linnaeus that Adriaan highly praised *Genera Plantarum* (Linnaeus 1737b).<sup>65</sup>

### *Ericetum Africanum*

Another project Adriaan van Royen had embarked on was *Ericetum Africanum*, describing heath plants from the Cape of Good Hope (A. van Royen 1740: praef. p. 10).<sup>66</sup> Probably for the same reasons that he had mentioned in a letter to Linnaeus in January 1739, explaining why he could not finish a completely



**Fig. 42** Original drawing made by the Leiden painter and draughtsman Pieter Cattel. It has served as an example for plate X of the planned *Ericetum Africanum* (see Fig. 43, 44). (Naturalis icones collection; L.2097367).

new catalogue of the plants in the Leiden botanical garden, Adriaan complained to Von Haller in March that year that he had no time to complete *Ericetum* (Suringar 1866: 262).<sup>67</sup> In May 1742, however, the copper plates for the prints were ready and Adriaan had a number of sets of proofs made from them.<sup>68</sup> The copper plates were prepared by the Leiden engraver Johannes van der Spyk after the drawings made by the Leiden painter and draughtsman Pieter Cattel (1712–1759). In 1753, a manuscript was ready (Linnaeus 1753: 354).<sup>69</sup> In 1756 *Ericetum* still had not appeared in a final published form. Ultimately, it was scheduled to be issued in the summer of 1761.<sup>70</sup> Why this did not happen is not known, but is probably due to Adriaan van Royen being very occupied with other matters.<sup>71</sup>

<sup>61</sup> Letter A. van Royen (8 January 1739) to Linnaeus (Linnaean correspondence L0272).

<sup>62</sup> That same day A. van Royen wrote to T. Gerber that *Prodromus* had been sent to the printer (Waller Manuscript Collection, Uppsala University Library, Ms benl-00621). A. von Haller wrote (11 January 1739) to Linnaeus that he had received Van Royen's *Prodromus* (Linnaean correspondence L0270). This was probably a copy of the manuscript because the first 20 pages were printed in June 1739 (Linnaean correspondence L0289) and the *Prodromus* was still in press in July (Linnaean correspondence L0291). In September it would be published soon (Linnaean correspondence L0303). Van Royen promised Linnaeus in November to send him a copy of *Prodromus* as a token of friendship (Linnaean correspondence L0310). It was sent to Linnaeus in December via J.F. Gronovius (Linnaean correspondence L0313).

<sup>63</sup> Letter A. von Haller (11 January 1739) to Linnaeus (Linnaean correspondence L0270).

<sup>64</sup> Letter Linnaeus (1 May 1737) to A. von Haller (Linnaean correspondence L0179).

<sup>65</sup> Letter J.F. Gronovius (8 February 1737) to Linnaeus (Linnaean correspondence L0144).

<sup>66</sup> On 24 October 1756 Linnaeus wrote to the French botanist Louis Gérard (1733–1819): 'Royenus reliquit hortum Leydensum, praxi medica mancipatus; tradidit eum successori, fratris filio, quem dicunt nihil omnino valere. Ego eum non novi. Certus sis quod senior Royenus nihil dabit a meo discessu. Elaboravimus quidem Ericas africanas, sed nunquam prodire (Translation. [Adriaan] Van Royen left the Leiden botanical garden, having retired from his medical practice; he handed it (the hortus) over to his successor, his brother's son (David van Royen), who is said to be totally ineffectual. I do not know him. Be assured that Van Royen senior will give nothing since my departure. We did indeed work on African heathers, but they have never come out (been published))' (Linnaean correspondence L2098).

<sup>67</sup> Letter A. van Royen (8 January 1739) to Linnaeus (Linnaean correspondence L0272).

<sup>68</sup> On 30 May 1742 J.F. Gronovius wrote to J.P. Breynie: 'De platen van het boek van Roeyen de Ericis Africanis werden tegenwoordig in het koper gesneden, en alreeds syn er so veele afgedaan, dat die heer daar al vyf honderd gulden verschooten heft (Translation. The plates for Van Royen's book on African ericas are now cut into copper, and already so many are finished that it has already cost him five hundred guilders)' (Margócsy 2014: 94, 242 note 77).





**Fig. 43** One of the first proofs of plate I for *Ericetum Africanum* with corrections written by Adriaan van Royen (Naturalis icones collection). Engraving made by Johannes van der Spyk after a drawing by Pieter Cattel.

Most of the herbarium specimens Adriaan van Royen studied for his *Ericetum* are in the 'Van Royen herbarium' and can often be recognised by references to the plate numbers that were made on the sheets by David van Royen. The original drawings (except that for plate 11) and one set of proofs of the plates (except that of plate 16), printed in folio, are in the collection of botanical 'icones' of Naturalis (Fig. 42, 43). On these Leiden proofs, the corrections that had to be made by the engraver are written by Adriaan (see the information given by Pieter Willem Leenhouts (1926–2004) in Stafleu & Cowan Vol. 4, 1983) (Fig. 43). These drawings and proofs are not mentioned separately in the auction catalogue of David van Royen's library (Anonymous 1800), but possibly had been incorporated in the 'Van Royen herbarium' associated with the corresponding herbarium specimens, where they were found by Brugmans.

When Brugmans's library was auctioned in Leiden in 1858 several sets of proofs and Adriaan van Royen's manuscript of *Ericetum*, entitled 'Collectanea de Ericae genere', were offered for sale. At this auction the copper plates were also sold. According to the catalogue, one of the auctioned sets of proofs was printed in 1772 on folio-sized paper and was provided with corrections that were written by the 'author' (Anonymous 1858: 6).<sup>72</sup> It seems that it was all bought by the German botanist Friedrich Wilhelm Wallroth (1792–1857). In any case, at the auction of Wallroth's library in Berlin by the bookseller and publisher Friedländer &



**Fig. 44** Later proof of plate I for *Ericetum Africanum* printed in 1772 (Leipzig University Library, Ms 2848). Engraving made by Johannes van der Spyk after a drawing by Pieter Cattel with a note about the provenance written by David van Royen. He also copied Adriaan van Royen's Dutch corrections ('Corrections quas suis prototypis adscripsit belgique Cl. A.v.R.') he had made in the earlier proofs (see Fig. 43). The name *Erica cerinthoides* L. (*Ericaceae*) was published by Linnaeus in *Species Plantarum* (1762).

Sohn in 1859, the set of proofs David van Royen had printed in 1772, as well as the manuscript were offered for sale again.<sup>73</sup> The current whereabouts of the manuscript is unfortunately unknown. The 1772 set, on the other hand, ended up in the library of Leipzig University (Ms 2848) (Fuchs 2011: 317). The notes on the proofs turn out to be written by David van Royen and thus not by the 'author' (i.e., Adriaan van Royen) as mentioned in the 1858 and 1859 catalogues. According to the background

<sup>69</sup> 'Numerosum gregem Ericarum Aethiopicarum aliorumque infinita diligentia dudum conquisivit, descripsit, delineavit & absolvit Botanicus vere magnus Ill. Adrian Royenus, quas ut edat publicae juris faciat, omnes Botanici mecum serio efflagitant (Translation. A numerous group of southern African heathers and others he has long collected, described, drawn and handled with infinite care, the truly great botanist, the Very Excellent Adriaan van Royen, and that he edits and publishes them, all botanists with me urge him to do so.)

<sup>70</sup> Letter N.L. Burman (18 July 1761) to Linnaeus (Linnaean correspondence L2926).

<sup>71</sup> Letter N.L. Burman (16 May 1769) to Linnaeus (Linnaean correspondence L4216).

<sup>72</sup> The description in the catalogue reads: '*Ericetum Africanum*, formant 40 planches noires, sans texte. Collection très intéressante de quelques ex. parmi lesquels se trouve un exemplaire in folio tiré en 1772 (Janvier), avec les corrections de la main de l'auteur, ainsi que quelq. feuilles MSS. intitulé: Collectanea de Ericae genere. Les planches en cuivre, de l'ouvrage seront vendues à la fois avec cette collection (Translation. *Ericetum Africanum*, comprising 40 black and white plates, without text. \*\*\*Very interesting collection of several copies, among which is a folio copy printed in 1772 (January), with corrections in the author's hand, as well as some MSS. leaves entitled: Collectanea de Ericae genere. The copper plates, of the publication will be sold at the same time with this collection.)

<sup>73</sup> Botanische Bücher-Sammlung aus dem Nachlasse des Dr. F.W. Wallroth, welche am 15. Juni 1859 und den folgenden Tagen öffentlich in unserem Auktions-Lokale Kurstrasse 9 versteigert werden soll. Appendix to Flora oder allgemeine botanische Zeitung (42) 19: 1–37. Lot 627. *Ericetum Africanum*. 40 vortrefflich gestochene Kupf. auf gross Papier in fol. ohne text. Ein gänzlich unbekannte nicht publiziertes Werk A. v. Royen's. Jede Tafel ist mit dem Namen u. d. krit. Analyse der darauf abgebildeten Pflanzen von der Hand des Verfasser versehen. Dazu ein Handschrift des Verfassers von 28 Folioseiten und sehr vielen kleineren Blättern, betitelt: Collectanea de Ericae genere. Translation: Lot 627. *Ericetum Africanum*. 40 superb copper engravings on large paper in fol. without text. A completely unknown unpublished work by A. v. Royen. Each plate is provided with the name and critical analysis of the depicted plants in the hand of the author. In addition, a manuscript by the author of 28 folio pages and very many smaller sheets, entitled: Collectanea de Ericae genere'.



**Fig. 45** Proof of plate X for *Ericetum Africanum* printed in 1772 (Leipzig University Library, Ms 2848). Engraving made by Johannes van der Spyk after a drawing by Pieter Cattel. The name *Erica plukenetii* L. (Syst. Veg. 1774) (Ericaceae), was written by David van Royen, who also added his own observations, A flower and a leaf David had sent to Thunberg ('florem a et semiverticillum foliosum ad Thunb. Misi').

information of this set that is added to the proof of plate I, David had the dirty copper plates cleaned and had them printed in 1772. On these proofs, he wrote his observations and the Linnaean name of the species. Besides, he also copied on the proofs the corrections that Adriaan had made in the past on his set of proofs (now in Naturalis) (Fig. 44, 45).

Somehow, two sets of plate proofs commissioned by Adriaan van Royen in the early 1740s and the copper plates, which were not mentioned in the catalogue, came into the hands of Friedländer, who had organised the auction of Wallroth's library in 1859. In 1874 Friedländer offered both sets for sale. On one set there was no text, on the other set the names had been written by Adriaan (Friedländer 1874: 417).<sup>74</sup> From the

copper plates, Friedländer produced several new sets in quarto, which he offered for sale at least as late until the early 1890s (Russell 1893: 966).<sup>75</sup> These nineteenth-century impressions reached many libraries, including that of Harvard University (Cambridge, Massachusetts), Natural History Museum, London, the University Library in Vienna and the Erasmus University in Rotterdam, The Netherlands. The only post 1753 set of proofs was printed in 1772. On these prints David van Royen added the latest Linnaean names in manuscript. We therefore conclude that *Ericetum Africanum* has no nomenclatural significance.

### Adriaan van Royen as a poet

From an early age, Adriaan van Royen took pleasure in writing verses in Latin. For occasions such as weddings and graduation ceremonies of fellow students he also wrote his congratulations in the form of Latin verses (A. van Royen 1733). He was genuinely sorry that the burden of all his duties and occupations prevented him from writing a verse to mark Linnaeus's wedding.<sup>76</sup>

The speech Adriaan van Royen gave about the history of disease as the basis of medical therapy when he set out his role as Rector Magnificus for the first time in 1743, was in prose (A. van Royen 1743). The subjects of his second and third rectoral addresses, in 1759 and 1771 were both in Latin verse (Suringar 1866: 291). In 1759 he wrote about the control of body and mind (A. van Royen 1759) and, in 1771, and about the illnesses of different age-groups (A. van Royen 1771). When Adriaan demitted office as professor of botany and retired as director of the Leiden botanical garden in 1754 his farewell-address, entitled 'When a botanist resigns his profession', was also in Latin verse (A. van Royen 1754, Molhuysen et al. 1937, Vol. 10: 846).

In 1766, on the day that Willem V (1748–1806) visited Leiden, Adriaan van Royen recited in the Academy building of the university a Latin poem in which he congratulated Willem on his inauguration as stadholder (A. van Royen 1766). In 1775 he read another Latin poem in the presence of Willem V, this time on the occasion of the second centenary of the University of Leiden (A. van Royen 1775). Before Adriaan spoke, Gaubius gave a more than two-hour lecture in the candle-lit church (Pieterskerk), followed by a speech by Wouter van Doeveeren (1730–1783). In his poem, Van Royen expounded on the many medical celebrities in the history of the university, but only a few people in the audience would have been able to understand anything that was said. The unfamiliarity with speaking in such a large building, the advanced age of the speakers, and especially the excessive number of people that completely filled the church made this impossible. In addition, those who had not been able to find a seat wandered around the corridors of the church, while the women in the choir held lively conversations to ward off boredom. This caused such a noise throughout the church that many, even those seated near the pulpit, heard little and understood much less (Anonymous 1775: 79–81, Schotel 1875: 206).

The following year Adriaan van Royen recited in the Academy building a poem on the occasion of his own retirement (A. van Royen 1776). It was inspired by his stay on the Duynsigt estate in Oegstgeest near Leiden, property that his wife had inherited in 1745 after the death of her father. Willem V came to Leiden especially for this occasion (Schotel 1875: 292, Molhuysen et al. 1937, Vol. 10: 847).

From his unpublished verses and prose he had written in 1773, it is evident that Adriaan van Royen was a fierce opponent of smallpox inoculation. These manuscripts were found in the

<sup>74</sup> Catalogue description: Royen, A. v., *Ericetum Africanum*, s. icones *Ericearum Africae*. 40 tabulae aeneae sine textu. (c. 1740.) 4. Opus ineditum. 4. Mit beigefügten Bestimmungen der Abbildungen von der Hand A. v. Royen's. 8.

<sup>75</sup> Catalogue description (Friedländer 1871): van Royen, Adrian, *Ericetum Africanum* s. icones *Ericearum Africae*. 40 tabulae aeneae hucusque ineditae. 4 M. Diese vortrefflich gestochenen Kupferplatten sind im Jahre 1859 aufgefunden und publicirt worden.

Catalogue description (Russell 1881: 524): Royen, A. van, (Prof. d. Botanik in Leiden, *Ericetum Africanum* s. icones *Ericearum Africae*. 40 tabulae aëneae hucusque ineditae. 4°. \*12 M. Diese vortrefflich gestochenen Kupferplatten sind im J. 1858 aufgefunden und von uns publicirt worden.

Catalogue description (Russell 1891: 966): Royen, Prof. A. V., *Ericetum africanum*, s. icones *Ericearum Africae*. C. 1760. (40 tab. aeri incisae.) 4°. \*20 M. (Abdrücke von d. Orig. - Kupferplatten. Nach Pritzel ein noch unbekanntes Werk. Text existirt nicht. Taf. wurden nach Zeichngn. P. Cattel's von J. v. d. Spyk gestochen.

<sup>76</sup> Letter A. van Royen (10 November 1739) to Linnaeus (Linnaean correspondence L0310).





**Fig. 46** Meeting room of the society 'Kunst wordt door arbeid verkregen' (Art is obtained by labour), in the house of the chairman, the bookseller and literator Cornelis van Hooegeveen (1740–1792), Lange Pieterskerk Choorsteeg (now nr. 20) in Leiden. The wooden cabinet at the end of the room houses the 'Panpoëticon Batavûm', comprising 327 painted miniature portraits of famous Dutch poets. Oil painting by Paul Constantijn la Fargue, 1774 (Museum De Lakenhal, Leiden, S 900).

family archive of Willem Pieter Sautijn Kluit (1838–1894), whose grandmother was Adriaan van Royen's granddaughter. In some he attacked Van Doeveren, who was a great advocate of this procedure (Van den Bosch 1791: 109, Daniëls 1875: 95–107). It is not known where these items are now.

Adriaan van Royen was an extra-ordinary member of merit of the prestigious poetry society, 'Kunstliefde spaart geen vlijt' ('The love of art spares no efforts'), in The Hague (Höweler 1937: 153). In December 1777 he became a member of the Leiden literary society 'Kunst wordt door arbeid verkregen' ('Art is obtained by labour') (Thobokholt 1983: 176) (Fig. 46). In 1772 this society had purchased the 'Panpoëticon Batavûm', a collection of portraits of all Dutch poets. It was started around 1700 by the wealthy Amsterdam amateur painter and poet Arnoud van Halen (1673–1732). He painted the portraits of Dutch poets (male and female), which he placed in a dedicated cabinet and was described by contemporaries as the 'treasure chest' of the Dutch literary canon (Thobokholt 1983: 17, Moerman 1993: 14, Van Deinsen 2016: 11). It was placed in the house of the chairman, the bookseller and poet Cornelis van Hooegeveen (1740–1792). In 1778 Adriaan's portrait was added (Van Hooegeveen 1778: 312) (Fig. 47).<sup>77</sup> Otterspeer (2002), in his history of Leiden University, is less flattering about Adriaan's poetry and speaks of his 'calcified poetry veins'. About his fall in February 1778 Adriaan van Royen wrote his final verse (A. van Royen 1778a). He died a year later but not before he had collated his poetry and had it printed at his own expense (A. van Royen 1778b, Brender à Brandis 1786: 12).



**Fig. 47** Adriaan van Royen at the age of 71. Miniature painting, oil on copper (1775), by Nicolaas Reyers (1719–1784), made for the 'Panpoëticon Batavûm', a cabinet with all Dutch poets (Fig. 46) (Rijksmuseum, Amsterdam, Inv. SK-A-4617).

<sup>77</sup> The cabinet was last recorded in 1849 and has since disappeared without a trace (Thobokholt 1983: 45, note 20, Moerman 1993: 14). Of the more than 300 portraits in this cabinet, 80 have been preserved, including that of A. van Royen (Rijksmuseum, Amsterdam).







dass ich nicht näher bei ihm wohne! Gewiss, ich wollte alle meine Kräfte und alle meine Beredsamkeit anwenden, um ihn zu vermögen, der Welt seine Bemerkungen mitzutheilen.

**Translation.** At 7 o'clock in the morning I walked to the botanical garden and heard the lecture of professor Van Royen. He was just explaining the inflorescence of plants, which I found very enjoyable because this part of botany is always treated very badly in our textbooks, even by the beloved Linnaeus. Our teacher performed his task excellently, and I wish that one day he would have his terminology published, especially since it contains much that is his own. In all we were with not more than six listeners, which is not many for such a famous university, however, it was also a bit chilly in the morning, and you know that many of our botanists today are afraid of colds! Many students are ashamed to listen to the explanation of the artificial terms, and think that as long as they know Latin, they do not need anything else. However, then also the wonderful 'Descriptiones Plantarum' (plant descriptions) followed! After the lecture, I paid my respects to the professor, who met me with all possible politeness and offered his services. I hope that one day the wonderful remarks from this skilful botanist are brought into the light, since he does not, like many other professors, have to waste the whole day with lectures, but only reads a single hour. Moreover, he does not have to earn his living by writing books or buttering up newspapers, but can use all his time making observations: It is therefore logical that, in such an excellent garden, over which he presided for so long, he has collected a large number of specimens. It is a shame that I do not live nearer to him! Surely, I would use all my strength and all my persuasion to enable him to communicate his remarks to the world'.

In 1786 James Edward Smith, who was in Leiden to obtain his doctor's degree, wrote in similar terms about the personality and standing of David van Royen. He described him as someone whose politeness and attention could not be surpassed and that his private wealth had placed him far above what the emoluments of the professorship would permit (J.E. Smith 1793: 10).

### Scientific work

Both David van Royen's dissertation (1752) and his inaugural address (D. van Royen 1754) were printed. Linnaeus, who did not know David then, wrote on 24 October 1756 that he was said to be totally ineffectual.<sup>80</sup> In his first letter to Linnaeus dated 18 March 1758, David apologised for his silence over the previous three years and hoped that Linnaeus would count him among his friends and exchange letters and seeds with him.<sup>81</sup> In the years that followed, David sent Linnaeus many seeds, herbarium material and botanical observations.<sup>82</sup> In the letter of June 1763 he had included a long list of questions and observations ('Centuria observationum et quaestionum botanicarum') for Linnaeus, with the request for answers and comments.<sup>83</sup> Linnaeus received David's letter on Christmas Day and made every effort to send an immediate reply. He did so in a letter of 26 December 1763.<sup>84</sup> With his letter of 7 June, David



**Fig. 49** David van Royen's drawing of a plant he had named *Codon hirtus* (L 0144502; *Boraginaceae*). His drawing is accompanied by a herbarium specimen. On the left a copy of the lateral branch David had sent to Linnaeus (Linn. Herb. 535.1), which is the type of *Codon royenii* L. (Jarvis 2007: 234).

had sent Linnaeus a parcel with herbarium material including a specimen of *Schwenckia* D. Royen ex L. (*Solanaceae*). In his reply Linnaeus wrote that this was the most beautiful material of this species that he had seen so far and that David should depict and publish it. The short description and illustration of this new plant that appeared in 1766, however, was issued by Schwencke (1766a) as an attachment to his list of the most commonly used native and foreign herbs (Schwencke 1766b). The Latin description is by D. van Royen, the Dutch translation by Schwencke.<sup>85</sup>

*Codon royenii* L. (*Boraginaceae*) is based on a drawing made by David van Royen and descriptions that he had sent to Linnaeus in 1767. In his letters he had named the species provisionally *Codon hirtus*.<sup>86</sup> The drawing, which is preserved in the Linnaean herbarium (535.1), bears the same name. Linnaeus's drawing is a copy of only the lateral branch in the drawing that David had made. David's own drawing, also named *C. hirtus* is in the 'Van Royen herbarium' and is accompanied by a herbarium specimen (L 0144502) (Fig. 49).

In his herbarium David also coined new species names such as '*Myrtus curcuma* Royen/M. *zantoxylon* Roy.' (L 0140935), '*Rumex divaricata* Royen' (L 0222855) and '*Atriplex capensis* D.v.R.' (L 0222878), none of which names was published.

In (23 December?) 1773 Martinus Houltuyn wrote to Van Royen that he had heard that Van Royen was busy writing a new edition of his uncle's *Prodromus*. Since it had been published in 1740 it had become outdated because so many new plants had arrived in the garden.<sup>87</sup> That Van Royen was indeed working on a new garden catalogue is apparent from the note 'Additam

<sup>80</sup> Letter Linnaeus (24 October 1756) to the French botanist Louis Gérard (1733–1819) (Linnaean correspondence L2098).

<sup>81</sup> Letter D. van Royen (18 March 1758) to Linnaeus (Linnaean correspondence L2318).

<sup>82</sup> See the correspondence between D. van Royen and Linnaeus (Linnaean correspondence L3269, L3338, L3874 and L3892).

<sup>83</sup> 'Centuria observationum et quaestionum botanicarum' (100 observations and questions regarding botany). The last observation on the last folio is dated 28 May (The Linnaean Collections (GB-110/LM/MA/ROY/1)). Sent by D. van Royen with his letter of 7 June 1763 to Linnaeus (Linnaean correspondence L3269).

<sup>84</sup> Letter Linnaeus (26 December 1763) to D. van Royen (Linnaean correspondence L3338).

<sup>85</sup> Letter D. van Royen (18 February 1767) to Linnaeus (Linnaean correspondence L3883).

<sup>86</sup> Letter D. van Royen (14 January 1767) to Linnaeus (Linnaean correspondence L3874) and letter D. van Royen (24 March 1767) to Linnaeus (Linnaean correspondence L3895).

<sup>87</sup> Letter M. Houltuyn (23 December? 1773) to D. van Royen. Waller Manuscript Collection, Uppsala University Library (Ms benl-00410).

ad prod. Leyds' he made on the labels of species that were not yet included in *Prodromus* (Fig. 40). David probably kept a record of the species which would be added to the new edition in the same way as Adriaan van Royen had done before him. He added in his own copy of the *Index Alter* all species not mentioned by Boerhaave.<sup>88</sup> For whatever reason David made little progress and in 1782, Ehrhart (1788: 117) wrote

that *Prodromus* was completely sold out and as rare as gold in Leiden and he expressed the hope that David would publish a new and enlarged edition, or even the complete catalogue which was never finished by Adriaan van Royen. David not only made efforts to publish a new edition of *Prodromus*, but also seemed to have thought of bringing *Ericetum* into the light (see *Ericetum Africanum* above). The judgement of David van Royen that was made by the French anatomist Thomas Lauth (1758–1826) in his letter of 10 November 1782 to Joseph Banks in London, namely that David did nothing, neither practise, nor teach nor describe plants (Chambers 2007: 31) is probably rather exaggerated.

<sup>88</sup> Letter D. van Royen (19 March 1759) to Linnaeus (Linnaean correspondence L2516).

### APPENDIX 3 – Examples of specimens

In the list below one or more examples of specimens attributed to their respective collector or previous owner are given. Examples are given of handwritings of which we believe we have sufficient certainty as to whom they belong or from whose herbarium they originate. As far as possible, the current Latin names are used. These are not always the same as those under which the specimen is recorded in the Naturalis database (<https://biportal.naturalis.nl/>), but metadata and, if available, a scan can be accessed viewed in this database with the use of the barcode.

1. Albinus, B.S. – Only two collections of seaweeds, i.e., *Calliblepharis ciliata* Kütz. (L 0101553; *Cystocloniaceae*) 'nomen manu Cl. B.S. Albin scriptum' and *Padina pavonica* (L.) Thivy (L 0220552; *Dictyotaceae*), 'ex Coll. Albiniana ubi pro roccella [illeg.]' were found which David van Royen may have received directly from Albinus. Both specimens have labels written by David van Royen. Unfortunately, the original label of the latter specimen is missing. The handwriting of Albinus can be seen on the labels of *Anthyllis cytisoides* L. (L 0224614; *Fabaceae*) 'ex coll. Tourn.'; *Cynoglossum cheirifolium* L. (L 0141837; a synonym of *Pardoglossum cheirifolium* (L.) E.Barbier & Mathez; *Boraginaceae*) 'Cl. Vaillant'; *Lamium garganicum* L. subsp. *striatum* (Sm.) Hayek (L 0422798 & L 0422799; *Lamiaceae*); and *Silene otites* (L.) Wibel (L 0223503; *Caryophyllaceae*). For B.S. Albinus handwriting see Fig. 50.

Examples of specimens with labels written by Vaillant that belong to Albinus's herbarium are: *Dianthus fruticosus* L. (L 0223296; *Fabaceae*); *Danthonia decumbens* (L.) DC. (L 0221351; *Poaceae*) both erroneously ascribed to Gessner. A third example is *Krascheninnikovia ceratoides* (L.) Gueldenst. (L 0222963; *Amaranthaceae*). For Vaillant's handwriting see Fig. 51. As is also the case in Vaillant's herbarium at P, De Tournefort's specimens have labels written by Vaillant. The specimen of *Morina persica* L. (L 0101521; *Caprifoliaceae*) 'Explum lectum in Oriente a Cl. Tournef.' may also have been one of the specimens in one of the three bundles.

Examples of unrecognised handwritings found on specimens associated with Albinus's specimens in the 'Van Royen herbarium' are shown in Fig. 52 and unrecognised hands found on Albinus specimens in Meerburg's herbarium are in Fig. 53.

2. Allioni, C. – *Odontarrhena argentea* (All.) Ledeb. (L 0223967; *Brassicaceae*) 'Allyssu argenteum misc. taur. V. p. 73, misit Allionius autor hujus species' (possibly original material of the species) (Fig. 54); *Ononis minutissima* L. (L 0076295; *Fabaceae*) '284/78 Allionius dedit'; *Saponaria lutea* L. (L 0223410; *Caryophyllaceae*) 'Allioni misit 1775'.
3. Banks, J. – *Asplenium abscissum* Willd. (L.3501552; *Aspleniaceae*); *Gleichenia* sp. (L 0220081; *Gleicheniaceae*), *Lonchitis hirsuta* L. (L 0423680; *Lonchitidaceae*).
4. Bassand, J.B. – *Echium vulgare* L. (L 0423106; *Boraginaceae*) '140/33 ex desertis Panchiona ad Temeswar (Timișoara, Romania), Bassand misit'; *Thymus* sp. (L 0367671; *Lamiaceae*) 'Thymus ex montibus Austriae. Bassand misit 1729 No 204'.



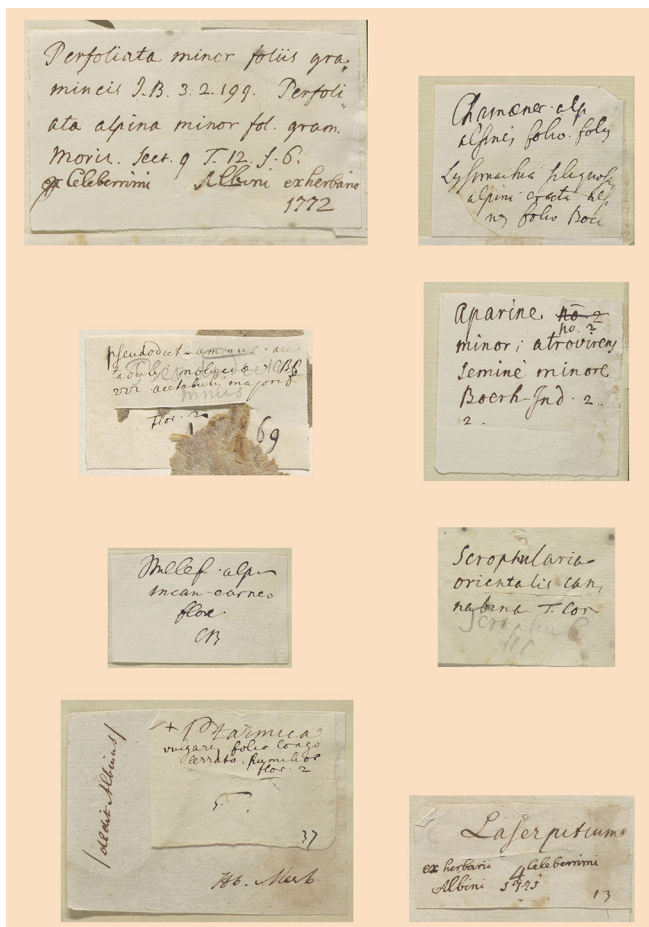
**Fig. 50** Five labels in a hand that is identical to the handwriting in the letters by Bernard Siegfried Albinus in the Waller Manuscript Collection, Uppsala University Library (Ms benl-00005 and Ms benl-00006). Below Albinus's contribution (12 June 1738) in the 'album amicorum' of the painter Johan Daniël Lavilette (c. 1694–?), fol. 10v. National Library of The Netherlands, The Hague (KW 132 G 15).





**Fig. 51** Four labels with the regular and tidy handwriting of Sébastien Vaillant, sometimes wrongly attributed to (Johannes) Gessner. All are accompanied by a second label in an unknown hand.

5. Bergius, P.G. – *Cerastium arvense* L. (L 0223249; *Caryophyllaceae*); *Elatine alsinastrum* L. (L 0140743; *Elatinaceae*) 'misit Cl. Berg.'; *Cherleria biflora* (L.) A.J.Moore & Dillenb. (L 0223216; *Caryophyllaceae*). For Bergius's handwriting see Fig. 55.
6. Beringer, J.B.A. – *Anchusa undulata* L. (L 0141813; *Boraginaceae*) 'Misit Ber. 1735'; *Geranium carolinianum* L. (L 0052944; *Geraniaceae*) 'Bering. 1733/217'; *Anchusa*

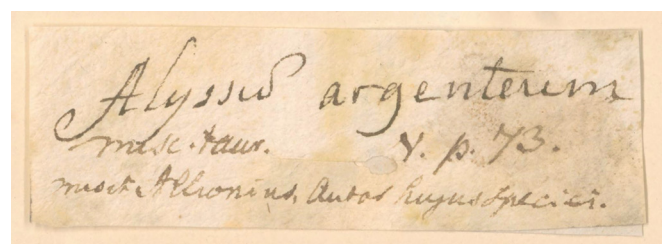


**Fig. 53** Handwritings found on specimens that are associated with the herbarium of Bernard Siegfried Albinus in the herbarium of Nicolaas Meerburg.



**Fig. 52** Handwritings found on specimens associated with the herbarium of Bernard Siegfried Albinus in the 'Van Royen herbarium'.

- arvensis* subsp. *orientalis* (L.) Nordh. (L 0141894) '212/35' 'Misit Ber. 1735' The latter also with a label written by Boerhaave.
7. Boerhaave, H. – *Lobularia maritima* (L.) Desv. (L 0223977; *Brassicaceae*) 'Jussieu 539/18' (scrips. A. van Royen). Adriaan probably copied the text from the original label which is lost, see also *Scrophularia frutescens* L. (L 014277; *Scrophulariaceae*), 'Jussieu 410/18'; *Atriplex patula* L. subsp. *?littoralis* (L.) Hall & Clemens (L 0222881; *Amaranthaceae*) 'Rand 396/20'; *Lamium purpureum* L. (L 0142054; *Lamiaceae*), dated 10 May 1714? or 1717?; and *Scrophularia scorodonia* L. (L 0142789). For Boerhaave's handwriting see Fig. 56.
8. Breyne, J. – *Plantago subulata* L. (L 0144230; *Plantaginaceae*); *Veronica fruticulosa* L. (L 0365009; *Plantaginaceae*); *Lathyrus aphaca* L. (L 0144217; *Fabaceae*); *Petrorhagia saxifraga* (L.) Link (L 0144209; *Caryophyllaceae*). For his handwriting see Fig. 10.
9. Brunelli, G. – *Physalis curassavica* L. (L 0142516; synonym of *P. viscosa* L., *Solanaceae*) '133/76 Brunellius misit'; *Vigna unguiculata* (L.) Walp. (L 0076293; *Fabaceae*) '195/85' 'Missa Cl. Brunelli'.
10. Burman, J. in A. van Royen – *Atriplex incana* F.Dietr. (L 0222870; *Amaranthaceae*) 'hoc titulo misit Burm'; *Phyllodium pulchellum* (L.) Desv. (L 0224767; *Fabaceae*) 'pro nova specie est hoc titulo misit Burm. 1730 (This new species was sent by Burman under this name in 1730)'.
11. Burman, N.L. in D. van Royen – *Flemingia lineata* (L.) Roxb. ex W.T.Aiton (L 0224798; *Fabaceae*), 'Ao. 1762 vivas ex H: Amst. accepimus'.



**Fig. 54** Label of *Odontarrhena argentea* (All.) Ledeb. (L 0223967; *Brassicaceae*). The name 'Alyssum argenteum' on the label is probably written by Carlo Allioni.



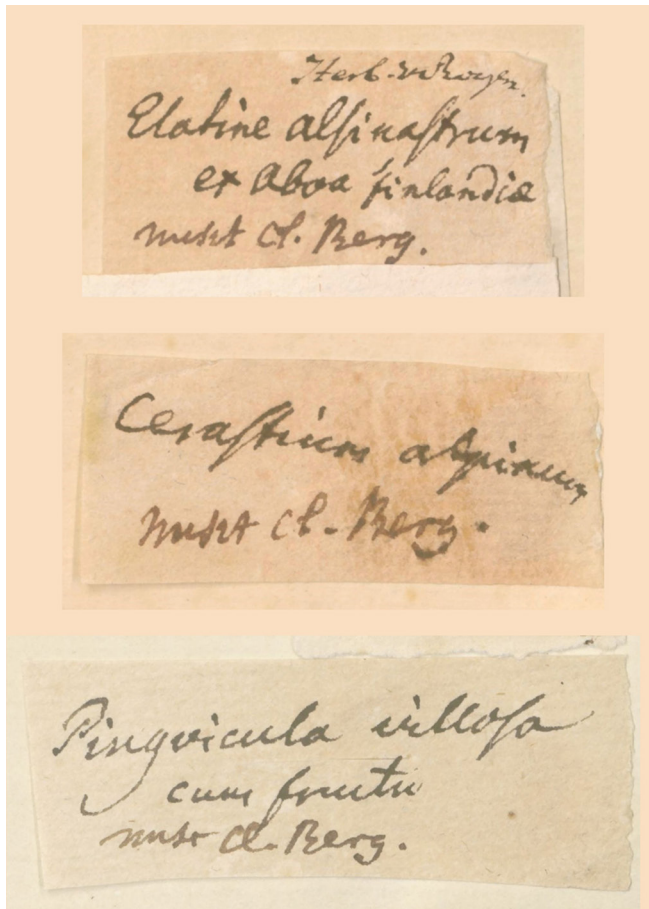


Fig. 55 Three examples of labels written by Peter Jonas Bergius (*Elatine alsinastrum* L., L 0140743, *Elatinaceae*; *Cerastium alpinum* L., L 0223249, *Caryophyllaceae*; *Pinguicula villosa* L., L 0142904, *Lentibulariaceae*).

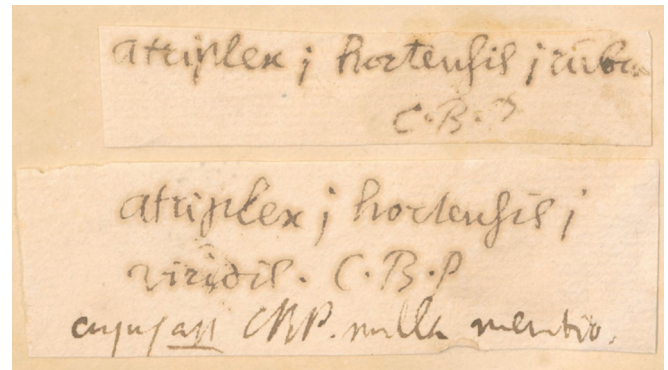


Fig. 56 Labels of *Atriplex hortensis* L. (L 0222867; *Amaranthaceae*) written by Herman Boerhaave.

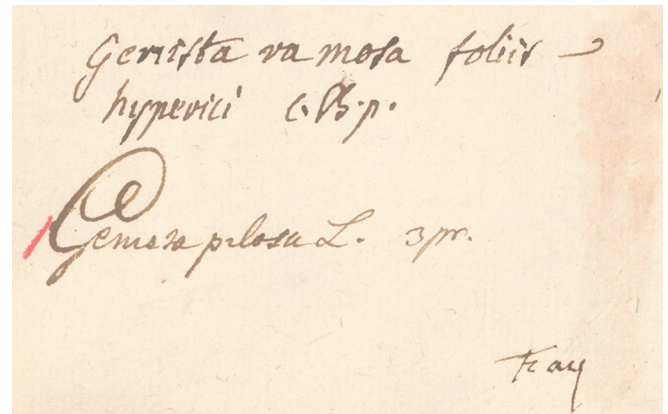


Fig. 57 Label of *Genista pilosa* L. (L 0141257; *Fabaceae*). The first two lines are probably written by Charles François de Cisternay du Fay.

12. Büttner, C. – The following two specimens of algae he gave to David van Royen in Paris in 1753: *Dilsea carnosa* (Schmidel) Kuntze (L 0101773; *Dumontiaceae*) 'a Cl. Büttnero 1753 Parisiis' and *Ulva* sp. (L 0220569; *Ulvaceae*) 'lectus a Dr. Rand prope Doveram, ibid. ubi et hoc specimen lectum fuisse docuit C. Büttner, a quo illud accepi ao 1753 Parisiis (Translation: Collected by Dr. Rand near Dover, in the same place where this specimen too had been collected, so C. Büttner told me, from whom I accepted that one in Paris in the year 1753)'.
13. Davies & Co. – *Kalmia angustifolia* L. (L 0144571; *Ericaceae*) 'Thyme leaved Kalmia corated (= sent) by Davis & Co. as an American one'; *Kalmia latifolia* L. (L 0144574) 'Davies 1758'.<sup>89</sup>
14. De Cisternay du Fay, C.F. – *Genista pilosa* L. (L 0141257; *Fabaceae*) 'Fay'; *Quercus coccifera* L. (L 0076016; *Fagaceae*) 'Fay'; *Salix cinerea* L. (L 0222629; *Salicaceae*) 'Fay'. For his handwriting see Fig. 57.
15. De Gorter, D. – *Lonicera tatarica* L. (L 0143088; *Caprifoliaceae*) 'D. de Gorter 1765'; *Caroxylon vermiculatum* (L.) Akhani & Roalson (L 0144435; *Amaranthaceae*) 'D. de Gorter 1765' 'Kali 14'. For his handwriting see Fig. 58. Some of Gorter's specimens were collected by Lerche and Gerber (see there).
16. De Gorter, J. – *Salix herbacea* L. (L 0222631; *Salicaceae*) 'De Gorter 1732'.
17. De Jussieu (Antoine?/Bernard?) – *Coronilla juncea* L. (L 0224710; *Fabaceae*) '391/40 misit Jussieu'; *Ononis mitissima* L. (L 0052928; *Fabaceae*) 'Jussieu 684/32'; *Phaseolus* sp. (L 0224958; *Fabaceae*) '170/35 Jussieu'; *Cullen corylifolium* (L.) Medik. (L 0224986; *Fabaceae*) 'Malvinda nomine misit Jussieu 1735'.
18. De Saussure, H.B. – *Leucanthemopsis alpina* (L.) Heywood (L 0143521; *Asteraceae*) 'Cl. Saussure dedit hoc specimen'; *Gentiana bavarica* L. (var. *alata*) (L 0141614; *Gentianaceae*); *Hornungia alpina* (L.) O.Appel (L 0224113; *Brassicaceae*) 'a Lepidium ex herbar. Saussurii'.
19. De Tournefort, J.P. – See 'The Herbarium collections of B.S. Albinus'.
20. DelaRoche, D. & Vieusseux, G. – *Moehringia ciliata* (Scop.) Dalla Torre (L 0223230; *Caryophyllaceae*) 'La Roche & Vieusieux 1764'.
21. Dick, J.J. – *Gentiana utriculosa* L. (L 0141636; *Gentianaceae*) 'Dick dedit'; *Lycopodium selago* L. (L 0144813; synonym of *Huperzia selago* (L.) Bernh. ex Schrank & Mart., *Lycopodiaceae*) '1765 D<sup>s</sup> Dick'; *Triticum turgidum* L. subsp. *dicoccum* (Schebl.) Thell. (L 0221388; *Poaceae*) 'D<sup>s</sup> Dick 220/72'.
22. Donati, V. – *Sideritis italica* (Mill.) Greuter & Burdet (L 0142339 and L 0142340; *Lamiaceae*) 'missa a Cl. Donati 280/58'.
23. Doody, S. – *Anaptychia ciliaris* (L.) A.Massal. (L 0220269; *Physciaceae*) 'found upon the rocks'; *Bartramia pomiformis* Hedw. (L 0329525; *Bartramiaceae*) 'Doct. Doodi'; *Distichium inclinatum* (Hedw.) Bruch & Schimp. (L 0096016; *Ditrichaceae*). For his handwriting see Fig. 59.
24. Ellis, J. – *Eugenia* sp. (L 0140912; *Myrtaceae*) 'ex conjectura hoc nomen hunc tribus quam corroboravit D<sup>ms</sup> Ellis

<sup>89</sup> According to Folkert van Straten with 'corata' and 'coravit' undoubtedly 'curata', 'curavit' was meant. 'Curare' has the basic meaning 'to take care of or to look after'. An interesting broadening of the meaning is 'to see to it that something ends up where you want it to' and here 'curavit' is more or less equivalent to 'misit' (sent).



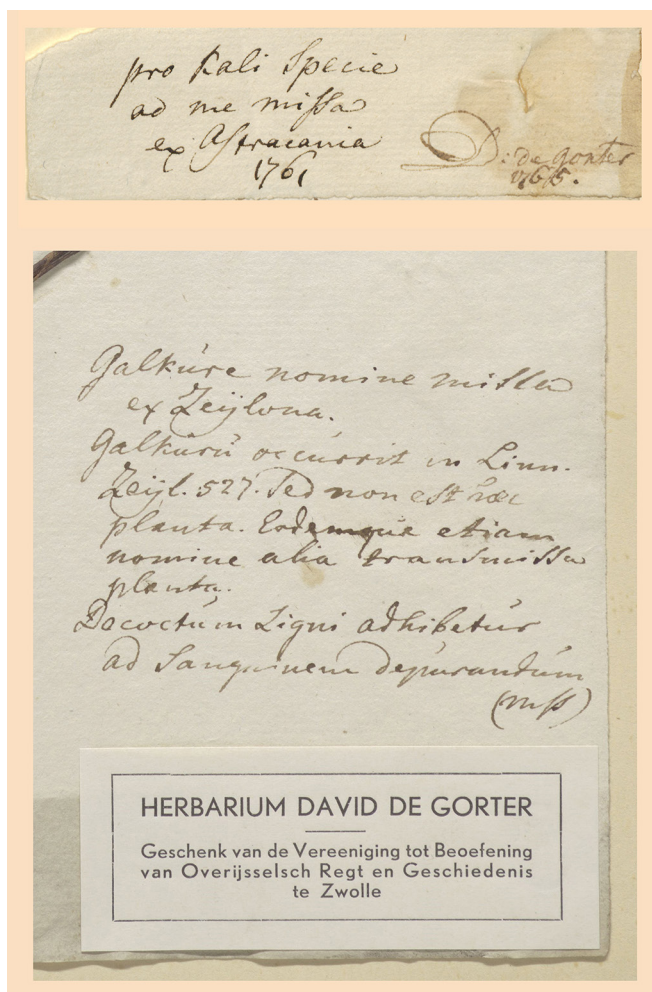


Fig. 58 *Salsola kali* L. (L 0770032; *Amaranthaceae*). 'pro Kali Specie ad me missa ex Astracania 1761' was written by David de Gorter (top). The handwriting is identical to that in David de Gorter's own herbarium (below).



Fig. 59 Handwriting of Samuel Doody. *Bartramia pomiformis* Hedw. (L 0329525; *Bartramiaceae*).

- q 1776 [illeg.] profs Philadelphica Williamson hortum invisit'; *Pontederia cordata* L. (L 0221763; *Pontederiaceae*) 'dedit 1753'.
25. Falck, I.W. – *Knoxia zeylanica* L. (L 0143026; *Rubiaceae*) '153/72 Rata Mull' and '60/73 Mata Rat'; *Anoetochilus regalis* Blume (L 0058578; *Orchidaceae*) No 64. 'Wanna Rajia of Koning der Bosschen'; '1773 ex Ceilona accipi vid. Litt. Meas ad gubernatorum Ampliss. D. Falck'; *Phragmites karka* (Retz.) Trin. ex Steud. (L 0221292; *Poaceae*) N°. 711/74; *Memecylon edule* Roxb. (L 0144489; *Melastomataceae*) was sent in 1781.
26. Fortescue – *Bambusa* sp. (L 0220952; *Poaceae*) 'A° 1785 Hort. Ac. Bat. Pro dono accepit à D° Fortescue Ultrajecti agente surculos Arundinis Bambos Linn. Lectos in Horto privato D°. Swellengrebel florente in suburb. Trajectino'.
27. Gaubius, H.D. – *Pterocladia capillacea* (Gmel.) Born. & Thur. (L 0144599; *Pterocladaceae*), a red seaweed, received in 1769.
28. Gerber, T. in A. van Royen – *Draba incana* L. (L 0224074; *Brassicaceae*) 'Gerber 1738/n. 190'; *Fagopyrum tataricum* (L.) Gaertn. (L 0222822; *Polygonaceae*) 'misit Gerber e Muscoviam'; *Umbelliferae* indet. (L 0141320; *Apiaceae*) 'Gerber ex Muscva 435/40'.
29. Gerber, T. in D. de Gorter – *Maianthemum trifolium* (L.) Sloboda (L 0222078; *Asparagaceae*) 'a Gerbero circa Tannain lecta'; *Lysimachia europaea* (L.) U.Manns & Anderb. (L 0141530; *Primulaceae*) 'Gerb. Tan.'.
30. Gessner, J. – *Athamanta cretensis* L. (*Apiaceae*) 'Gesnery misit'; *Circaea intermedia* Ehrh. (L 0423180; *Onagraceae*) 'in albis collegit Gesnery'; and *Astrantia minor* L. (L 0140995; *Apiaceae*) 1731 'Gesnery misit'.
31. Gmelin, J.F. – *Alyssum alyssoides* (L.) L. (L 0223973; *Brassicaceae*) 'J.F. Gmelin Tubinga misum 1773'; *Aurinia saxatilis* (L.) Desv. (L 0223984; *Brassicaceae*) 'Cl. J.F. Gmelin misit que Tubinga 1773'; *Dianthus armeria* L. (L 0223280; *Caryophyllaceae*) 'J.F. Gmelin 73'. For his handwriting see Fig. 60.
32. Gómez-de Ortega, C. – *Lithodora fruticosa* (L.) Griseb. (L 0100220; *Boraginaceae*) 'Cl. Ortega misit ex Hispania'; *Ortega hispanica* L. (L 0223384; *Caryophyllaceae*), 'Ortega misit specimen, & nomen adscriptum'; *Vella pseudocytisus* L. (L 0224211; *Brassicaceae*) 'misit Cl. Ortega ex Hispania, 1779 vivam aluit Hort. Leid. & 1780'. For his handwriting see Fig. 61.
33. Gother, E. – *Carex muricata* L. (L 0221533; *Cyperaceae*) 'leg. 1759'. For his handwriting see Fig. 62.
34. Gronovius J.F. in Van Royen s.l. – *Claytonia virginica* L. (L 0223194; *Montiaceae*) 'NB Nomen hoc anglicum adscripsit autor Florae Virginicae D° J.F. Gronovius, *Echinopspermum virginicum* Lehm. (L 0141847; a synonym of *Hackelia virginiana* (L.) I.M. Johnst., *Boraginaceae*) 'Utraque verae q [= abbreviation of qua, quas quae, quam etc.] obscurior a Jo. F. Gronovio profecto'; *Potamogeton pusillus* L. (L 0052634; *Potamogetonaceae*) 'Gronov.'; *Verbesina*

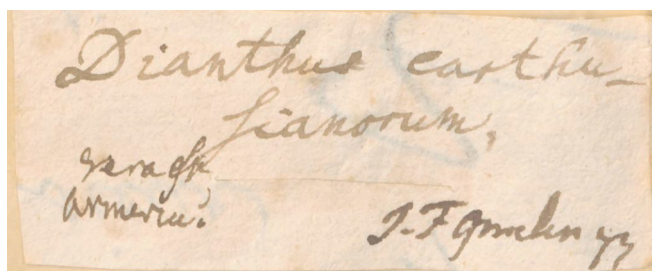


Fig. 60 Label of *Dianthus armeria* L. (L 0223280; *Caryophyllaceae*). The name *Dianthus carthusianorum* (L.) is probably written by Johann Friedrich Gmelin.





Fig. 61 Label of *Ortega hispanica* L. (L 0223384; *Caryophyllaceae*) and of *Vella pseudocytisus* L. (L 0224211; *Brassicaceae*). With the names of the plants probably written by Casimiro Gómez-de Ortega.

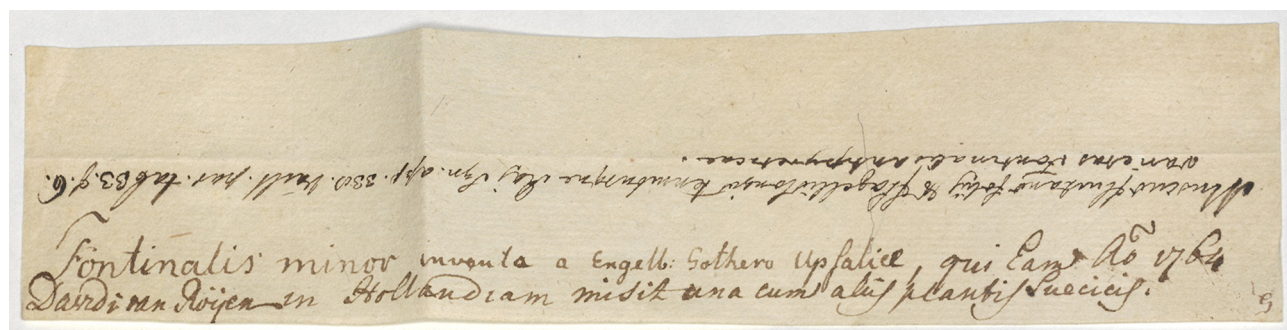


Fig. 62 Label of *Fontinalis antipyretica* Hedw. (L 0423523; *Fontinalaceae*). The words 'Fontinalis minor inventa a Engelb. Gothero Upsaliae' are written by Engelbert Gothar, the subsequent text by David van Royen.

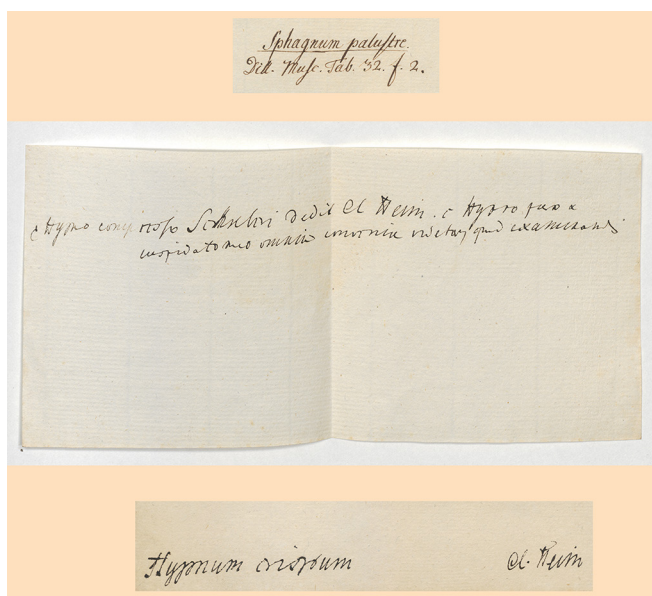


Fig. 63 Label of *Sphagnum acutifolium* Schrad. (L 0367543; *Sphagnaceae*) written in a hand that occurs on the specimens of Ernst Ludwig Heim. The labels of *Pleurozium schreberi* (Willd. ex Brid.) Mitt. (L 0368001; *Hylacomiaceae*) and *Neckera crispa* Hedw. (L 0365018; *Neckeraceae*) are written by Heim.

*occidentalis* (L.) Walter (L 0144170; *Asteraceae*) 'Inveni hanc plantam pro Sig<sup>a</sup> occidentali in Clar. Gronov. Patris herbario, quum ille in Oct. 1778 veniit (Translation: I found this plant identified as Sig(esbecki)a occidentalis in the herbarium of the Most Distinguished Gronovius's father, when that was sold in October 1778)'. J.F. Gronovius received specimens collected by Amman (*Erica cinerea* L. (L 0141355; *Ericaceae*) 'Amman ex Anglia, ex coll. Gronov.'), Gessner (*Iberis carnosa* Willd. (L 0224118; *Brassicaceae*)) and W. Sherard (*Callicarpa americana* L. (L 0141948; *Lamiaceae*) 'D. Guil. Sherard').

Examples of the handwriting of J.F. Gronovius can be seen in Fig. 26, 27, 28, 32 and 35.

35. Gronovius J.F. or L.T. in Van Royen s.l. – *Bonannia graeca* (L.) Halácsy (L 0141001; *Apiaceae*) 'ex Horto Cl. Gronovii'; *Veronica virginica* L. (L 0142876, a synonym of *Veronicastrium virginicum* (L.) Farw., *Plantaginaceae*) 'ex horto Cl. Gronovii'.
36. Gronovius. L.T. in D. van Royen – *Cyperus longus* L. subsp. *badius* (Desf.) Bonnier & Layens (L 0221614; *Cyperaceae*) 'ex horto coravit (= delivered) Nob. L.Th. Gronovius 1762'. Examples of the handwriting of L.T. Gronovius are given in Fig. 26, 27 and 28.
37. Hebenstreit, J.E. – *Ononis natrix* L. (L 0424986; *Fabaceae*) '816/36 misit Hebenstreit' and *Trifolium cherleri* L. (L 0052933; *Fabaceae*) '811/36 Hebenstreit'.

38. Heim, E.L. – *Ceratodon purpureus* (Hedw.) Brid. (L 0220634; *Ditrichaceae*), *Evernia* sp. (L 0220377; *Parmeliaceae*), *Hygrohypnum luridum* (Hedw.) Jenn. (L 0221992; *Amblystegiaceae*). For his handwriting see Fig. 63.
39. Heinzelman, J.G. – *Atriplex tatarica* L. (L 0222892; *Amaranthaceae*) '326/37'.
40. Heister, L. – *Vicia hybrida* L. (L 0328452; *Fabaceae*) 'misit Heister'.
41. Hermann, P. – *Desmanthus virgatus* (L.) Willd. (L 0224745; *Fabaceae*) 'scriptum est manu Pauli Hermanni'; *Silene* sp. ('*Lychnis maritima lusitanica purpurea flore pulcherrimo*'; L 0223373; *Caryophyllaceae*). For his handwriting see the label of a specimen he had named '*Portulacca americana latifolia erecta floribus albis, manu Hermanni adscripta* [...]' (L 0223200; *Portulacaceae*). It is filed as *Portulaca americana* ? but identified by D. van Royen as *P. curassavica* var. *pilosa* L., now *C. pilosa* L. (Fig. 64).
42. Houstoun, W. in Miller – The Scottish physician and botanist William Houstoun (1695–1733) had travelled in the West Indies. After his return to Europe, he came to Leiden in 1728 to study with Boerhaave. He graduated in 1729 (Dandy 1958: 139). During his time in Leiden, Adriaan van Royen and Houstoun undoubtedly became acquainted. Houstoun left his herbarium to Miller (Staffleu & Cowan 1979, Vol. 2: 342–343). See *Bidens pilosa* L.



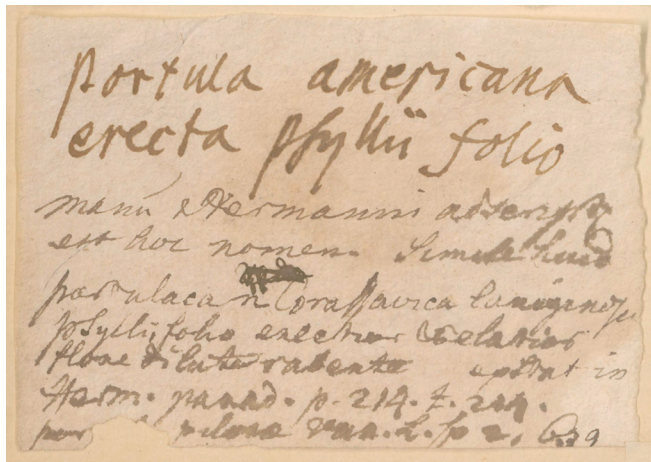


Fig. 64 Label of *Talinum paniculatum* (Jacq.) Gaertn. (L 0223200; *Talinaceae*) written by Paul Hermann ('manu Hermannii adscripta').

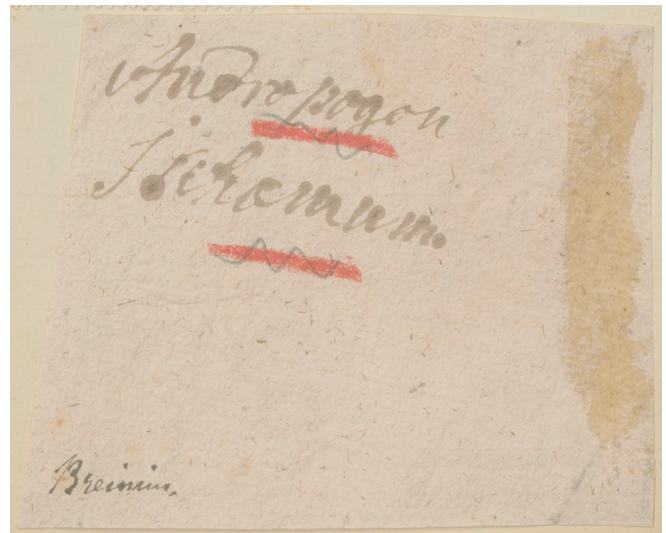


Fig. 65 Label of *Bothriochloa ischaemum* (L.) Keng (L 0220953; *Poaceae*) written by Nicolaus Joseph Jacquin (wrongly attributed to Breyne).

- (L 0143443; *Asteraceae*) '244/51 Miller misit'; *Froelichia interrupta* (L.) Moq. (L 0052858; *Amaranthaceae*) 'manu Phil. Milleri script.'; and *Gomphrena serrata* L. (L 0223089; *Amaranthaceae*) 'ex Campechy' 'scripsit Philip Miller'.
43. Houttuyn, M. – *Myristica fragrans* Houtt. (L 0144557; *Myristicaceae*) 'Cl. Houttuin dedit Jun. 1784'; *Piper retrofractum* Vahl (L 0423611; *Piperaceae*) 'Cl. Houttuyn dedit Juni 1784'.
44. Jacquin, N.J. – *Androsace elongata* L. (L 0141214; *Primulaceae*) '24 Aug. 1762 Vienna missa a Cl. Jacq.'; *Iris virginica* L. (L 0223278; *Iridaceae*) '187/72 Misit Cl. Jacquin'; *Juncus jacquinii* L. (L 0052762; *Juncaceae*) 'quem Cl. Jacquin collegit in Schneeberg de quo in litteris suis d. 5 Aug. 1761 ad me scribit' (Type); *Mimosa casta* L. (L 0224907; *Fabaceae*) '773/61 'Jacquin misit semina'; *Oreojuncus trifidus* (L.) Záv. Dráb. & Kirschner (L 0221814; *Juncaceae*) 'Juncus quem collegit Cl. Jacquin de quo ita scribit 5 Aug. 1762' (possible type of *Juncus monanthos* Jacq.); *Passiflora serratifolia* L. (L 0140813; *Passifloraceae*) 'Jacq. Hort Vind. Tab. 10 qui hoc specimen misit'. Jacquin's collections are sometimes wrongly attributed to Breyne. See *Bothriochloa ischaemum* (L.) Keng (L 0220953; *Poaceae*). For his handwriting see Fig. 65.
45. Kallström, A. – See *Dactylorhiza sambucina* (L.) Soó (L 0222525; *Orchidaceae*) 'Kalström 1763'; *Elatine hydropiper* L. (L 0140745; *Elatinaceae*) 'Kalström 1763'.
46. König, J.G. – *Calophyllum calaba* L. (L 0052989; *Calophyllaceae*); *Pothos scandens* L. (L 0052748; *Araceae*). For his handwriting see Fig. 20.
47. LeMonnier, L.-G. – *Hormathophylla spinosa* (L.) P.Küpfer (L 0223986; *Brassicaceae*) 'coravit (= sent) Cl. Le Monnier 1753'; *Phyteuma hemisphaericum* L. (L 0143257; *Campanulaceae*) 'Coravit Cl. Le Monnier 1753'; *Phyteuma orbiculare* L. (L 0143263) 'hoc titulo nobiscum coravit Cl. Le Monnier 1753'; and *Veronica persica* Poir. (L 0142866; *Plantaginaceae*) 'corata (= sent) a Cl. Le Monnier'.
48. Lerche, J.J. in D. de Gorter – *Lonicera tatarica* L. (L 0143188; *Caprifoliaceae*) 'D. de Gorter 1765'; *Salsola kali* L. (L 0770032; *Amaranthaceae*) 'ad me missa ex Astracania 1761' 'D. de Gorter 1765', and *Salsola kali* L. (L 0770033) 'Lerchii ex Astracania 1761' 'D. de Gorter 1765'.
49. Lidbeck, E.G. – *Diapensia lapponica* L. (L 0144577; *Diapensiaceae*) 'misit Cl. Lidbeck 868/62'.
50. Linnaeus, C. – *Orchis anthropophora* (L.) All. (L 0222505; *Orchidaceae*) 'misit Linnaeus ex Suecia 1739'; *Androsace villosa* L. (L 0144494; *Primulaceae*) 'Scripsit haec no[m]i[n]a Cl. Car. Å Linnèi pater. (Translation: These names were written by the very famous Carolus von Linné the elder.)'; *Ophrys lutea* Cav. (L 0222571; *Orchidaceae*) 'misit

Linnaeus hoc no[m]i[n]e 1739'; *Saxifraga rotundifolia* L. (L 0141488; *Saxifragaceae*) 'Linn. Misit'.

51. Locher, [J.G.] – *Moraea collina* Thunb. (L 0222349; *Iridaceae*); *Sparaxis bulbifera* (L.) Ker Gawl. (L 0222444 and L 0222447; *Iridaceae*); *Tritonia crocata* (L.) Ker Gawl. (L 0222462; *Iridaceae*) 'Lochei'.
52. Malcolm, W. – *Rondeletia* sp. (L 0143062; *Rubiaceae*) 'D. Malcolm privatum horti botanicum colens in Suburbia Londinensis hanc plantam vivum misit Hort. Leid. 1772'.
53. Manson, J. – *Hypericum crux-andreae* (L.) Crantz (L 0326813; *Hypericaceae*) 'D. Manson negociator Roterodamensis dedit C. aliis Caroliniensibus p<sup>is</sup> siccus'; and *Boltonia asteroides* L'Hér. (L 0143448; *Asteraceae*) 'è Carolinà p. D<sup>m</sup>. Manson'.
54. Marsili, G. – *Ammannia verticillata* (Ard.) Lam. (L 0421166; *Lythraceae*) 'misit Cl. Jo. Marsili Patavia'; *Camphorosma monspeliaca* L. (L 0222903; *Amaranthaceae*) 'Misit Cl. Jo. Marsili'; *Firmiana simplex* (L.) W.Wight (L 0140667; *Malvaceae*) 'A' 1774 Cl. Marsili hujus semina misit'; *Ludwigia palustris* (L.) Elliott (L 0422760; *Onagraceae*) 'missa a Cl. Marsilia ex Italia'; *Firmiana simplex* (L.) W.Wight (L 0140667) 'A' 1774 Cl. Marsili hujus semina misit'; *Solanum capsicoides* All. (L 0421027; *Solanaceae*) 'Semina mistit Cl. Marsili 134//68'; *Trapa natans* L. (L 0140948; *Lythraceae*) 'Cl. Marsili misit'. For his handwriting see Fig. 66.
55. Meese, D. – *Gelidium versicolor* (S.G.Gmel.) J.V.Lamour. (L 0220533; *Gelidiaceae*) 'a Meese corata (= sent)'.
56. Miller, P. in A. van Royen – *Colubrina arborescens* (Mill.) Sarg. (L 0140429; *Rhamnaceae*) 'misit Miller hoc nomine'; *Ipomoea lacunosa* L. (L 0141753; *Convolvulaceae*) 'misit Miller ex America'; *Lippia stoechadifolia* (L.) Kunth (L 0141978;

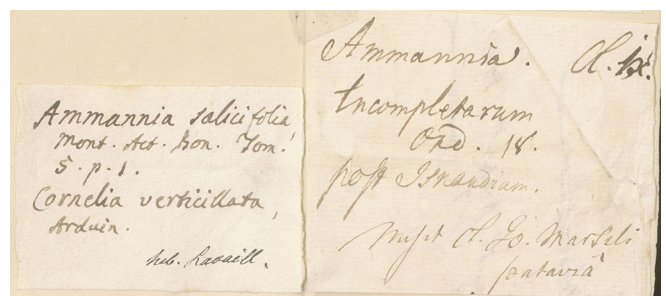


Fig. 66 The left label of *Ammannia verticillata* (Ard.) Lam. (L 0421166; *Lythraceae*) is in the hand of Giovanni Marsili (L 0421166), the attribution in an unknown hand to the herbarium of a certain Lavall(?) being incorrect.



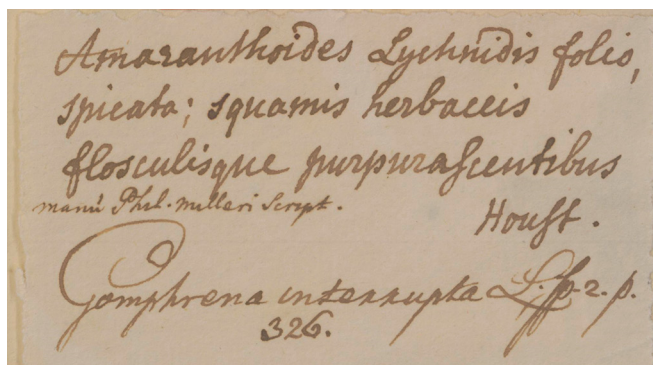


Fig. 67 Label of *Froelichia interrupta* (L.) Moq. (L 0052858; *Amaranthaceae*) 'manu Phil. Milleri script'.

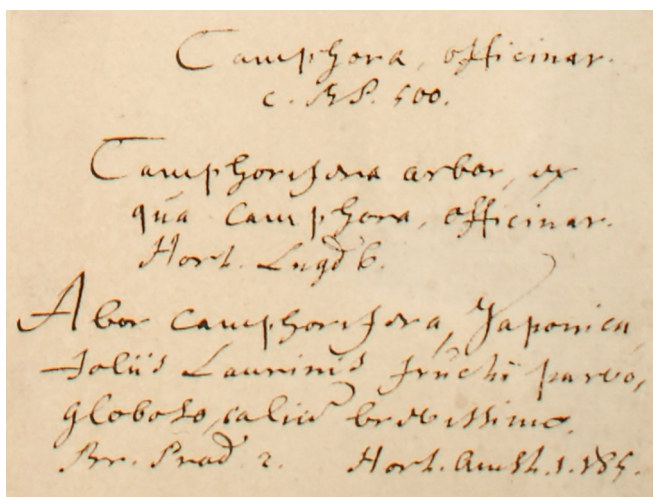


Fig. 68 Label of *Cinnamomum camphora* (L.) J. Presl (L 0144598; *Lauraceae*) written by Frederik Ruysch.

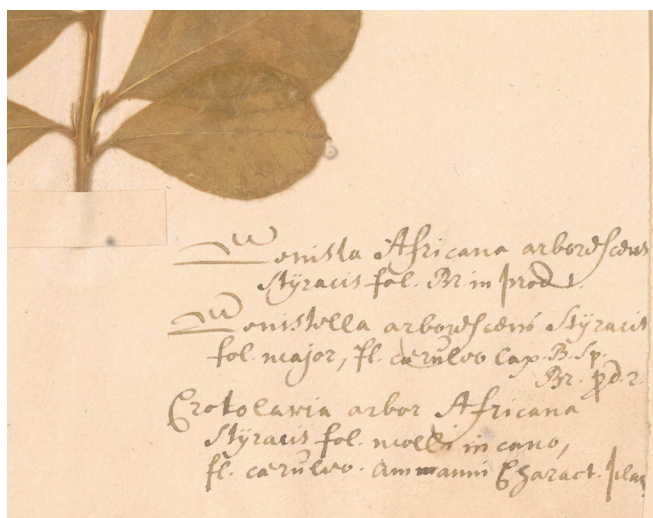


Fig. 69 Label of an *Genista africana arborescens* [...] in Breyne Prodomus (now named *Podalyria myrtilifolia* (Retz.) Willd., *Fabaceae*; L 0224969) which must have been in one of the herbarium volumes bought by Johan Frederik Gronovius and Adriaan van Royen at the auction of the second collection of Frederik Ruysch in 1731. The handwriting must be that of Hendrik Ruysch.

*Verbenaceae*) 'Misit Miller 1735'; *Salvia verbenaca* L. (L 0367579; *Lamiaceae*) 'Miller, 15 Juli 1751'; *Tephrosia cinerea* (L.) Pers. (L 0140015; *Fabaceae*) '178/31 Miller misit hoc titulo'. Among the plants sent by Miller to Adriaan van Royen there were also some that had been collected by Houstoun (see there).

57. Miller, P. in D. van Royen – *Pleurolobus gangeticus* (L.) J. St.-Hil. ex H. Ohashi & K. Ohashi (L 0144765; *Fabaceae*) 'Miller misit hoc titulo 345/62'; *Fuertesimalva peruviana* (L.) Fryxell (L 0140600; *Malvaceae*) '464/55 Miller' 'habitat Peru'; *Myroxylon balsamum* (L.) Harms (L 0224916; *Fabaceae*) 'Balsamum tolu' (scrips. Miller). For his handwriting see Fig. 67.
58. Monti, G. in A. van Royen – *Silene otites* (L.) Wibel (L 0223504; *Caryophyllaceae*) '22/31 misit Monti'; *Vicia sativa* L. var. *nigra* Ehrh. (L 0140084; *Fabaceae*) '381/31'.
59. Monti, G. in D. van Royen – *Dianthus monspessulanus* L. (L 0223300; *Caryophyllaceae*) 'missa a Cl. Monti 1756'; *Echinochloa crus-galli* (L.) P. Beauv. (L 0221084; *Poaceae*) 'Monti'; *Panicum capillare* L. (L 0221239; *Poaceae*) 'Monti'.
60. Pallas, P.S. – See under Sandifort.
61. Pontedera, G. – *Lobularia maritima* (L.) Desv. (L 0223979; *Brassicaceae*) 'Ponted. 523/37'; *Bupleurum odontites* L. (L 0420690; *Apiaceae*) 'Ponted. Misit 1747'; *Convolvulus siculus* L. (L 0141734; *Convolvulaceae*) '91/36 Pontedera misit'.
62. Rand, I. – *Urena lobata* L. (L 0140646; *Malvaceae*) '154/30 Malvinda, sinensis, frutescens, fructu, lappacea Miller Rand'. See also Büttner.
63. Richard, C. – *Ulmus americana* L. (L 0222675; *Ulmaceae*) 'a Richardo ex Horto Trianonensi in Hollandiam missa'. Richard visited David van Royen in 1769.<sup>90</sup>
64. Richardson, R. – *Agrostis stolonifera* L. (L 0220884; *Poaceae*) 'Richardson misit'.
65. Rouveroi – *Ambrosia maritima* L. (L 0143303; *Asteraceae*) 'Rouv.'; *Limonium echinoides* (L.) Mill. (L 0422544; *Plumbaginaceae*) '557/35 ex Hispania accepit & misit D. Rouveroi'.
66. Ruysch, F. – *Adiantum pulverulentum* L. (L 0220006; *Pteridaceae*) 'ex collectione Cl. Ruyschii 1731'; *Cinnamomum camphora* (L.) J. Presl (L 0144598; *Lauraceae*); and *Seriphium cinereum* L. (L 0144137; *Asteraceae*) 'Cl. Ruyschy 1731'. For his handwriting see Fig. 68.
67. Ruysch, H. – *Juncus bulbosus* L. (L 0221777; *Juncaceae*); *Phleum pratense* L. (L 0221288; *Poaceae*); *Plumbago europaea* L. (L 0141549; *Plumbaginaceae*); and *Podalyria myrtilifolia* (Retz.) Willd. (L 0224969; *Fabaceae*). For his handwriting see Fig. 69.
68. Sandifort, E. – An unidentified brown seaweed (L 0220577) 'Fucus rariss./mihi datus at/inventus in littore maris, qua illud pagum 's Gravesande praeter fluit', collected at 's Gravezande in The Netherlands; *Euchema muricatum* (S.G. Gmel.) Weber-Van Bosse (L 0101535; *Solieriaceae*) 'a Cl. Sandif' accipi hoc specimen, quod profecta a D. Pallas'; *Nitophyllum* sp. (L 0101546; *Delesseriaceae*) 'sine no[m] i[n]e accepi a Cl. Sandfort ille a D° Pallas'; and *Phycodrys rubens* (L.) Batters (L 0101774; *Delesseriaceae*) received from Pallas. Maybe all were collected by Pallas.
69. Schober, G. – *Brassica juncea* (L.) Czern. (L 0224006; *Brassicaceae*) '257/33' 'misit Schober 1733'.
70. Schuurmans Stekhoven, J. – *Dracaena draco* (L.) L. (L 0221915; *Asparagaceae*) 'empta ex plantis a Schuurmane relictis'; *Polystichum acrostichoides* (Michx.) Schott (L 0220140; *Polypodiaceae*) '18 Jun. 1773 vivam habui ex Hort. Schuurmansii'; *Yucca aloifolia* L. (L 0222105; *Asparagaceae*) 'empta hoc species est in auct. Schuurmansii'.

<sup>90</sup> Letter D. van Royen (13 May 1769) to Linnaeus (Linnaean correspondence L4214).



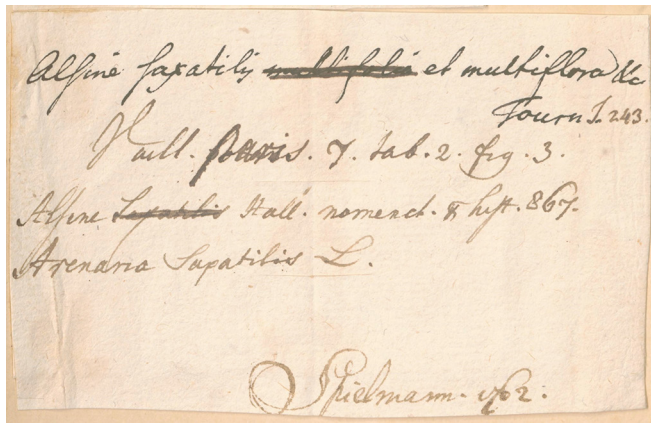


Fig. 70 Label of *Sabulina verna* (L.) Rchb. (L 0223237; Caryophyllaceae), first line probably written by Jacob Reinhold Spielmann.



Fig. 71 *Dryopteris lacera* (Thunb.) Kunze (L 0144237; Polypodiaceae). The genus name *Polypodium* L. was added by Thunberg.

71. Schwencke, M.W. – *Bumelia* sp. (L 0141552; synonym of *Sideroxylon* sp.; Sapotaceae) 'Horti Hagani 1785'; *Myrsine melanophloeos* (L.) R.Br. ex Sweet (L 014515; Primulaceae) 'Ex Horto Schwenckii'; *Pectis linearis* La Llave (L 0143972; Asteraceae) 'ex horto Cl. Schwencke 14 Octob. 1761'; *Wahlenbergia capensis* (L.) A.DC. (L 0143279; Campanulaceae) 'Coravit (= sent) Cl. Schwencke 1761'.
72. Sherard, J – *Ageratum conyzoides* L. (L 0143301; Astera-ceae) 'misit Sherard'; *Amaranthus blitum* L. subsp. *oleraceus* (L.) Costea (L 0223056 & L 0223057; Amarantha-

ceae) '778/31' D'Sherard'; *Asperula arvensis* L. (L 0142977; Rubiaceae) 'misit Sherard', *Malva thuringiaca* (L.) Vis. (L 0140573) 'Sherard misit'.

73. Sibthorp, H.W. – *Suaeda altissima* (L.) Pall. (L 0223012; Amaranthaceae) '246/50 Sibthorp misit'.
74. Spielmann, J.R. – *Moehringia ciliata* (Scop.) Dalla Torre (L 0223231; Caryophyllaceae) 'has plantas ad nos misit Cl. Spielmann professor Argentoratensis'; *Asparagus sarmentosus* L. (L 0221874; Asparagaceae) 'Cl. Spielm. q[uae]-vivam misit ao 1776'; *Avena orientalis* Schreb. (L 0220934; synonym of *A. sativa* L.; Poaceae) 'Spielman. No. 13/1781; *Commicarpus scandens* (L.) Standl. (L 0223103; Nyctagi-naceae) 'pla viva ex Hort: Argentoratensis missa 1775'. Most of his specimens are dated 1762, e.g., *Silene dioica* (L.) Clairv. (L 0223362; Caryophyllaceae) 'Spielman 1762'; *Trifolium hybridum* L. (L 0140035; Fabaceae) 'Spielman 1762'. For his possible handwriting see Fig. 70.
75. Thunberg, J.P. – *Larix kaempferi* (Lamb.) Carrière (L 0144242; Pinaceae) from Japan. For Thunberg's handwriting see Fig. 71.
76. Themans, J. – *Saccharum officinarum* L. (L 0100985; Poa-ceae) 'è Java misit D<sup>s</sup> Themans'.
77. Tilli, A.A. – *Cucumis melo* L. (L 0667986; Cucurbitaceae) 'ex Ital. Tilli misit'; *Salvia serotina* L. (L 0142213; Lamia-ceae) '162/51 Tilli misit'.
78. Tulbagh, R. – *Crassula capensis* (L.) Baill. (L 0224279; Cras-sulaceae) 'Ao 1754 inter varia plantarum ad Caput Bona Spei provenientum exemplaria ad Nob: Acad. L.B. Curatores transmissa fuit'; *Widdringtonia cedarbergensis* J.A.Marsh (L 0220814; Cupressaceae) 'è Cap b. Spei semine accepti

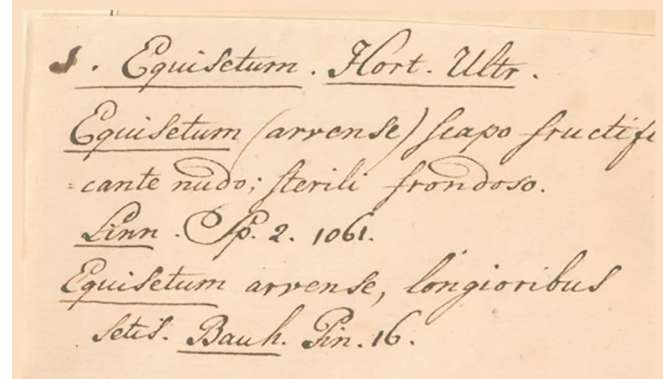
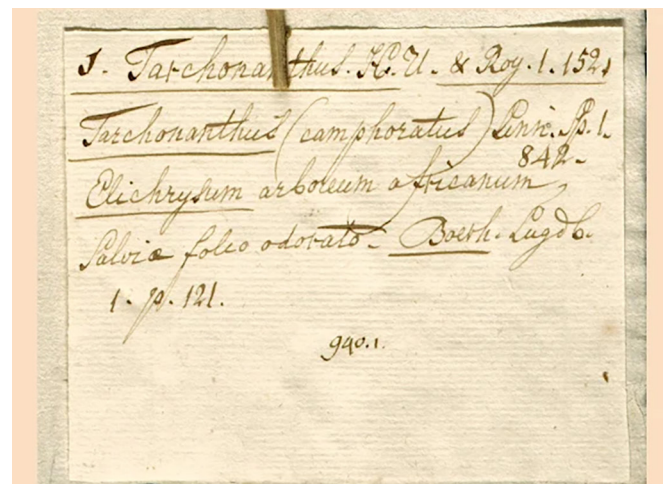


Fig. 72 Label (top) of *Santolina chamaecyparissus* L. (U 1145497; Astera-ceae) from the Van Geuns collection of the former Utrecht herbarium (U). Compare with the label of *Equisetum arvense* L. (L 0571926; Equisetaceae) below from the 'Van Royen herbarium'.



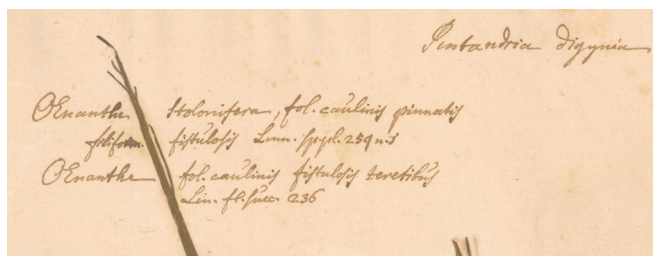


Fig. 73 *Limonium binervosum* (G.E.Sm.) C.E. Salmon (L 0141540; Plumbaginaceae). The handwriting on this specimen is identical to that of Murk van Phelsum in his herbarium now in the Groningen University Museum.

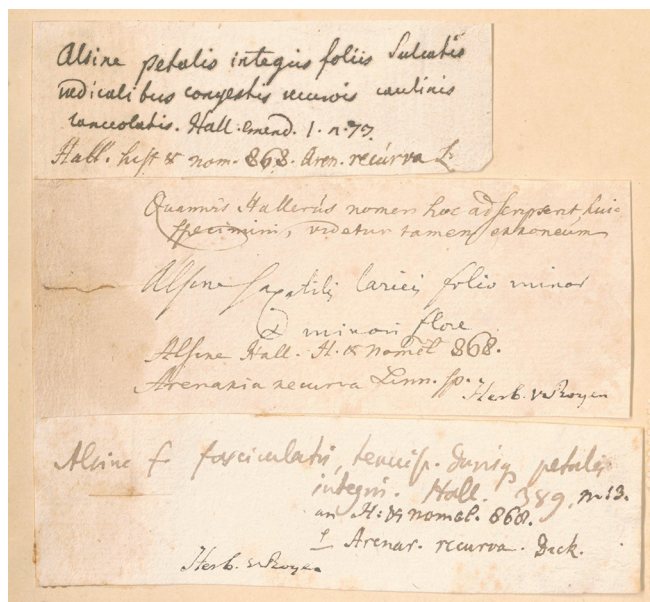


Fig. 74 The name '*Alisma saxatile* [...]' on the label in the middle was written by Von Haller. Above Von Haller's identification, David van Royen has written: '*Quamvis Hallerus nomen hoc adscripserit, huic specimini videtur tamen erroneum*', meaning that although Von Haller added this name to this specimen, it seems to be incorrect'. Specimens with labels like the upper and lower one, in an unknown hand, are probably also from Von Haller's herbarium, perhaps collected by botanists, like Dick (see David van Royen's European correspondents listed above), who collected plants for Von Haller.

- sata 595/55'; *Chaetosciadium trichospermum* (L.) Boiss. (L 0141057; Apiaceae) '760/62'; *Muraltia heisteria* (L.) DC. (L 0144567; Polygalaceae) '1762 Vivam plantam è Cap. Bon Spei accepi'; *Pelargonium hirtum* (Burm.f.) Jacq. (L 0100245; Geraniaceae) 'Caap 1762'; *Pseudognaphalium luteoalbum* (L.) Hillard & B.L. Burtt (L 1310677; Asteraceae) 'C.B. Spei 1763'; *Oncosiphon sabulosus* (Wolley-Dod) Källersjö (L 0143906; Asteraceae) 'Hoc exemplum A° 1763 è Cap. Bona Sp ei accepi'; *Pelargonium crispum* (P.J. Bergius) L'Hér. (L 011235) 'A° 1763'; *Pelargonium hermanniifolium* (P.J. Bergius) Jacq. (L 0100233) 'Cap. B. Spei 1764'; and *Ixia maculata* L. (L 0222387; Iridaceae) 'Caap 1764'.
79. Twent, H. – *Digitalis grandiflora* Mill. (L 0142647; Plantaginaceae) 'non floruit in H. Acad. L. Bat. Neque apud D. Twent unde petita. – ex Hortulani conjectura erit Calendula'. Has not bloomed in the Leiden botanical garden nor at Mr. Twent's whence it was acquired. – According to the Hortulanus's guess it will be *Calendula* L. (Asteraceae).
80. Vahl, M. – *Strychnos lucida* R.Br. (L 0141601; Loganiaceae) 'Cl. Vahl Plantarum Hi Hafniensis Demonstrator misit 1783'; and a specimen of a new genus from Sri Lanka (now *Stylidium uliginosum* Sw. ex Willd.; L 0235926; Stylidiaceae) 'dedit Cl. Vahl plantar. Horti Hafniensis demonstrator misit 1783'.
81. Vaillant, S. – See B.S. Albinus. For Vaillant's handwriting see Fig. 42.
82. Van Geuns S.J. & Van Geuns, M. – *Ammocharis longifolia* (L.) Herb. (L 0222138; Amaryllidaceae); *Equisetum arvense* L. (L 0571926; Equisetaceae); *Triticum aestivum* L. (L 0221400; Poaceae). For the labels in his herbarium see Fig. 72.

83. Van Hazen, W. – *Syncarpha gnaphaloides* (L.) DC. (L 0143885; Asteraceae) 'ex Horto v. Hazen 9 Junii 1764'; *Spiraea tomentosa* L. (L 0224585; Rosaceae) 'Spiraea nova ex Horto Wilhelmi v Hazen'; *Teucrium lusitanicum* Schreb. (L 0367577; Lamiaceae) 'ex Hort. V. Hazen'.
84. Van Phelsum, M. – *Ramonda myconi* (L.) Rchb. (L 0142900; Gesneriaceae); *Sambucus nigra* f. *laciniata* (L.) B.P.R. Chéron (L 0143093; Viburnaceae); *Sargassum vulgare* C. Agardh (L 0220562; Sargassaceae). For his handwriting see Fig. 73.
85. Von Haller, A. – *Distichium capillaceum* (Hedw.) Bruch & W. Schimper (L 0367621; Distichiaceae); *Erigeron alpinus* L. (L 0143641; Asteraceae); *Euphrasia officinalis* L. (L 0142669; Orobanchaceae); *Schoenus nigricans* L. (L 0221666; Cyperaceae); *Trifolium alpinum* L. (L 0140027; Fabaceae); *Trifolium lupinaster* L. (L 0140039) 'misit Haller 72/1746'. For Von Haller's handwriting see Fig. 74.

**APPENDIX 4** – Possible type collections of Gaertner taxa which have been encountered so far in the Van Royen carpological collection and herbarium. Despite the fact that König is mentioned as the collector, these collections are likely to be the remains of the annual shipments of seeds from Ceylon to Leiden

1. *Aegiceras majus* Gaertn. (L 0144695), syn. of *A. corniculatum* (L.) Blanco
2. *Aegiceras minus* Gaertn. (L 0144817), syn. of *Rourea minor* (Gaertn.) Merr.
3. *Caranda pedunculata* Gaertn. (L 0059243), syn. of *Psydrax dicoccos* Gaertn.
4. *Chionanthus ghaeri* Gaertn. (L 0059236), syn. of *Scirpoidendron ghaeri* (Gaertn.) Merr.
5. *Croton cardiospermus* Gaertn. (L 0420524), syn. of *Aporosa cardiosperma* (Gaertn.) Merr.
6. *Cyminosma* Gaertn. (L 0144724), syn. of *Acronychia* J.R. Forst. & G. Forst.
7. *Elaeocarpus oblongus* Gaertn. (L 0059237), syn. of *E. serratus* L.
8. *Fagara lunu-ankenda* Gaertn. (L 0059242), syn. of *Melicope lunu-ankenda* (Gaertn.) T.G. Hartley
9. *Gmelina lobata* Gaertn. (L 0144735), syn. of *G. asiatica* L.
10. *Gyrinops walla* Gaertn. (L 0144730)
11. *Hydnocarpus venenatus* Gaertn. (L 0059239)
12. *Meesia serrata* Gaertn. (L 0144816), syn. of *Campylospermum serratum* (Gaertn.) Bittrich & M.C.E. Amaral
13. *Myristica irya* Gaertn. (L 0144694), syn. of *Horsfieldia irya* (Gaertn.) Warb.
14. *Myrobalanus bellirica* Gaertn. (L 0144629), syn. of *Terminalia bellirica* (Gaertn.) Roxb.
15. *Psydrax dicoccos* Gaertn. (L 0076334), filed under *Plectronia didymus* (J.F. Gaertner) Bedd.
16. *Sphenoclea zeylanica* Gaertn. (L 3744011)
17. *Trichopus zeylanicus* Gaertn. (L 0144625)
18. *Vareca zeylanica* Gaertn. (L 059238), syn. of *Casearia zeylanica* (Gaertn.) Thwaites