

Welcome to

Flora's Art



Science Library Exhibition
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Introduction

Knowledge of plants has always been vital to human existence; for food, medicine, or even cultural needs. Describing and depicting plants has a tradition that even goes back to before the Ancient Greek herbalists, who were foundational to European botany.

Throughout history, botanical depiction has gone through major changes. How plants were represented depended on shifting functions of botany books, changing conceptions of nature, as well as on evolving printing techniques. This exhibition follows botanical representation from Medieval and Renaissance herbals, through 18th century coffee table books, to modern field guides and research tools.

Welcome to the history of Flora's Art!

Early Botanical Works

Herbals in Antiquity [1L1]

Greek scholars such as Theophrastus (371 – c. 287 BC) or Dioscorides (40 – 90 CE) were seminal to the European tradition of plant taxonomy. Their main concern for describing plants was to support practical usage: correct identification and uses of plants, in particular in pharmacology.

Since knowledge was passed on through manual copying, plant representations are almost exclusively decorative in these works. However, some copies of illustrations remain, such as in a 7th-century copy of Dioscodides *De Materia Medica* (the *Codex Neapolitanus*). The illustrated plants are displayed with sufficient detail as to make them identifiable, while the Greek text explains key characteristics and uses.

On display:

1. Blunt, Wilfrid, and Sandra Raphael. *Herbarius & cruydtboeck: beroemde geïllustreerde plantenboeken*. Amerongen: Gaade, 1981.
2. Huxley, Robert. *De Grote Natuuronderzoekers*. Becht's Uitgevers., 2008.



Figure 1: Pimpernel in Dioscodides, *the Codex Neapolitanus*, 7th century.

Herbals at the Dawn of Printing [1L2]

Herbals were plant books with name variations, identifying characteristics, and uses. Their main function was to enable readers to recognise plants and put them to use, often for medical purposes. Herbals mixed botanical descriptions with folklore or myth, attempting to bring together all that was known about the plants, including the knowledge of Ancient sources.

After the newly invented printing press was used to reproduce religious books, herbals were among the first books to be printed. These illustrations mainly served to mimic the illuminations of earlier manuscripts. However, the rather crude woodblock printing technique did not allow for recognisable depictions, such as the fennel displayed here.

On display:

1. Anon., *Den Herbarius in Dyetsche* (Antwerp c1500). Repr. L.J. Vandewiele: Christian de Backer, Gent 1974.
2. Madragora from Peter Schöffer, *Gart der Gesundheit*, 1485 (in: Heilmann, KE. *Kräuterbücher in Bild und Geschichte*. München: Kölbl, 1966.)

Aurea mala.



Figure 1: Aurea mala in R. Dodoens *Stirpium Historiae Pemptades Sex*, 1583.

Renaissance Herbals

Dodoens' *Cruydtboek* [1L3]

Dodoens' milestone *Cruydtboek* (1554) attempted to present over 1300 species in a coherent system, grappling with inconsistent taxonomies, names and contradictory sources. To provide wide access to botanical knowledge, books like these were often translated in the common tongue. After the Bible, the *Cruydtboek* was the most translated book of the 16th century and was re-edited until 1644.

Compared to early herbals, figures had become much more refined, effectively assisting plant identification. The skilfully carved wood blocks used to print these images were traded between publishers, to appear in herbals all over Europe.

On display:

The tomato in the Latin version: Dodoens, Rembert. *Stirpum Historiae Pemptades Sex*. Antwerp: Plantijn, 1583. Repr. Nieuwendijk: de Forel, 1979.

The *Kreuterbuch* [1L4]

The German counterpart of the *Cruydtboek* was Leonhart Fuchs' *Kreuterbuch* of 1543. It was based on a Latin version and then translated into German for wider access. Similarly, Hieronymus Bock's *Kreütterbuch* described 700 useful plants in German. The main focus of these books was medicinal plant use, as herbal knowledge was essential to physicians.

Just like most botanists, Fuchs himself was a medical doctor; botany would remain part of medical training into the 19th century. When European botanists discovered a new flower in the Dominican Republic, they named it after this great German doctor: *Fuchsia*. The flowers are all over his birth town Wemding to commemorate him.

On display:

1. Fuchs, Leonhart. *Kreuterbuch*. 1543. Repr. Grünwald: Kölbl, 1975.
2. Bock, Hieronymus, and Melchior Sebisch. *Kreütterbuch*. Strassburg: Josiam Rihel, 1577. Repr. München: Grünwald, 1964.

Clariss: LINNÆI. M. D.
 METHODUS plantarum SEXUALIS
 in SISTEMATE NATURÆ
 descripta



- Monandria.*
- Diandria.*
- Triandria.*
- Tetrandria.*
- Pentandria.*
- Hexandria.*
- Heptandria.*
- Octandria.*
- Enneandria.*
- Dicandria.*
- Dodecandria.*
- Tricandria.*
- Polyandria.*
- Didynamia.*
- Tetradynamia.*
- Monadelphica.*
- Diadelphica.*
- Polyadelphica.*
- Syngenesia.*
- Gynandria.*
- Monoccia.*
- Dioccia.*
- Polygamia.*
- Cryptogamia.*

Lugd. bat: 1736

G.D. EHRET. Palat. heidelb.
 fecit & edidit

Figure 3: Ehret's sheet for Linnaeus' sexual system for the description of plants.

Carl Linnaeus (1707-1778)

***Species Planarum* [1R1]**

With his *Species Plantarum* (1753), Carl Linnaeus applied his new binomial nomenclature and strict taxonomy to all known plants. Using sexual features of flowers, counting stamens and pistils, a botanist could easily classify even unknown plants arriving from world-wide colonial exploration.

Although Linnaeus had little faith in identifying plants through figures, instead preferring minute verbal description, other botanists soon provided supporting illustrations. While his system was later abandoned as overly artificial, his work lives on in thousands of species names denoted with *L.*

On display:

1. Linnaeus, Carolus, William T. Stearn, and J.L. Heller. *Species Plantarum: A Facsimile of the First Edition* 1753. London: The Ray Society, 1959.
2. Linnaeus and his wife Sara Lisa Moraea by JH Scheffel in 1739, in: Blunt, Wilfrid, and William T. Stearn. *The Compleat Naturalist: A Life of Linnaeus*. London: Collins, 1971.

Linnaeus' Sexual Plant Determination Method [1R1]

To support plant determination in the Linnaean system, the German botanist Georg Dionysius Ehret provided sheets with instructive illustrations, which he sold for 2 guilders. Although Linnaeus rejected figures, Ehret's sheets were sometimes bound into copies Linnaeus' books – often without acknowledgement of Ehret's work, to his great anger.

In this illustration, the priority for plant representation was correct classification in the Linnaean taxonomy. Rather than a specific plant, we are instructed in the typical shapes of flower stamen. This could, for instance, help classify a plant as belonging to the class of *Pentandria* ('five-menly'), and then further in the order of the *Dyginia* ('two-womenly') if you counted two pistils.

On display:

Georg Dionysius Ehret, *Methodus Plantarum Sexualis in Sistemate Naturae Descripta*, Leiden, 1736/Heidelberg.



Fig. 4: Plate XVIII.



Fig. 5: Plate XXIII.



Fig. 6: Plate LX.

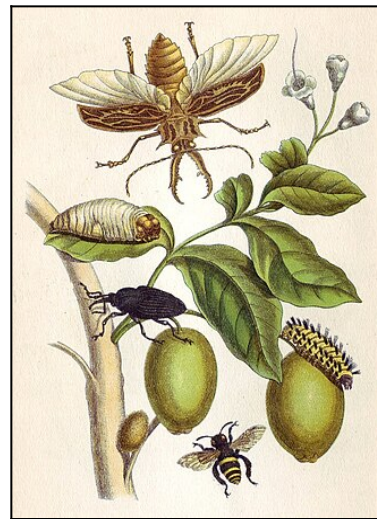


Fig. 7: Plate XLVIII.



Fig. 8: Plate I.



Fig. 9: Plate XXVII.

18th Century Coffee Table Books ('pronkboeken')

Around 1700, lavish and exquisitely illustrated botanical books started to appear that targeted rich collectors with an interest in Naturalia. These 18th century versions of coffee table books (*pronkboeken*) were very expensive and often decorative rather than strictly scientific.

The hand-painted works, created before colour printing, contained very detailed drawings, but not all were based on observation. The details sometimes had a decorative function, rather than strictly aiming for scientific accuracy. These big and vibrantly illustrated books allowed their owners to impress their guests and allowed them to showcase wealth, knowledge, and artistic taste.

Maria Sybilla Merian: A Botanical Pioneer [1R2]

Unlike any of her contemporaries, Maria Sibylla Merian portrayed plants together with the insects that lived on them, including their metamorphosis. Born to renowned publisher Matthäus Merian the Elder, she developed an early fascination with natural sciences, particularly entomology. Favouring Dutch flower painting over traditional botanical illustration, she blended artistic sensitivity with scientific precision.

In 1699, Merian travelled to Suriname, spending two years studying and collecting tropical flora and fauna. Her 1705 masterpiece, *Dissertatio de generatione et metamorphosisibus insectorum Surinamensium*, featured 72 striking plates, drawn in a powerful, confident style. Merian's work remains a landmark of botanical illustration.

On display:

Merian's work in: Mulder, Hans. *De ontdekking van de natuur*. Terra, 2021.



Figure 10: *Geum urbanum* in J. Kops, *Flora Batava*, 1800.

Berthe Hoola van Nooten: *Fleurs, Fruits et Feuillages* [1R2]

Self-taught botanical artist Berthe Hoola van Nooten collaborated with local illustrator Radhen Salikin to capture the lush beauty of Java. Her neo-Baroque style blended scientific precision with rich colours and detail, rendering illustrations an almost tactile quality. The pictures were printed using Belgian lithographer Pieter De Pannemaeker's new chromolithography technique and then carefully hand-coloured.

Although accompanied by descriptions regarding plants' history and uses in French and English, the work was primarily a luxurious showpiece for collectors, rather than a scientific resource. In spite of public praise and some commercial success, Hoola van Nooten died in poverty in 1892.

On display:

Coppoolse, D. and M. van Dorst. *Berthe Hoola van Nooten (1817-1892)*. Noordboek, 2024.

***Flora Batava*: Showpiece and Symbol [1R3]**

With its vivid hand-coloured plates and elegant design, *Flora Batava* (1800–1934) clearly belongs to the tradition of *pronkboeken*—lavish natural history volumes meant to impress and inspire. But this remarkable work is more than just a showpiece. Over time, it also became a quiet but powerful expression of Dutch national identity, portraying the native flora with both scientific care and artistic beauty.

The *Flora Batava* was a monumental publishing project that spanned over 130 years! Its illustrations and concise plant descriptions reflected shifting approaches to botany, art, and publishing, as well as evolving ideas about nature as a national heritage.

On display:

Kops, Jan. *Flora Batava 1800-1934: de wilde planten van Nederland*. Den Haag/Tielt: KB/Lannoo, 2023.

The complete *Flora Batava*
at the KB:



Instrument of Colonisation

Plant Hunters [2L1]

Botany became all the rage in 19th century England. Kew gardens became one of the most important plant collections in the world, sending out botanists such as father and son William and Joseph Hooker to the far corners of the Earth, collecting new and ever more exotic plants. This inspired gardeners and plant enthusiasts to grow these exotic species in lavish English gardens.

The plant craze created a demand for botanical magazines as well as regional flora, with a constant need for botanical illustration. The plant rage combined taxonomic precision with aesthetic appreciation of plants, producing illustrations of astonishing beauty.

On display:

Botanical illustrations by W.H. Fitch, in: Rix, Martyn. *Floralia: Botanische Kunst door de Eeuwen Heen*. Kew: Botanical Gardens, 2012/2022.

Transporting Plants [2L1]

In many historical projects of exploration or even colonisation, plants figure centrally. European colonial powers in particular had an interest in the botany of explored lands, describing plants and bringing them back to European botanical gardens. This required skilful transportation and care for living plants on deck, during long sailing voyages.

With precious plants such as coffee or cacao, botanical gardens could become powerhouses of colonisation. Crops were studied and redistributed to form colonial plantations or to feed the enslaved people who worked them. In many cases, indigenous knowledge of plants and their uses was absorbed unacknowledged into European botanical works.

On display:

1. How to ship living plants, in: Lemmon, K. *The Golden Age of Plant Hunters*. London: Phoenix House, 1968.
2. Heniger, J. *Hendrik Adriaan van Reede tot Drakenstein (1636-1691) and Hortus Malabaricus*. Rotterdam: Balkema, 1986.
3. Martin de la Cruz, *Libellus de Medicinalibus Indorum Herbis*, 1552. (W. Gates, *An Aztec Herbal*, 1939/2000).



Figure 11: Large-fruited Eucalyptus, or Gum-Tree (*Eucalyptus macrocarpa*) in W. H. Fitch, *Curtis's Botanical Magazine*, 1847.

Cultured Plants [2L2]

A concern for agriculture and practical plant breeding leads to different plant representations, with a particular focus and style. A crop with agricultural importance such as the potato could become the topic of an entire book, also describing plant diseases or culturing techniques.

As plant breeding delved into plant genetics, plant representation no longer focused on taxonomic identification, but on variations within species, linked to genetic characteristics. Genetics also requires its own form of art: representations of ordered genes on chromosomes, or schematics of gene expression. With culturing, phytopathology, or genetics, entirely different aspects of plants become relevant and need to be displayed.

On display:

1. Vries, Hugo de. *Het veredelen van kultuurplanten*. Haarlem: Tjeenk Willink, 1908.
2. Vayda, M. E., and W.D. Park. *The molecular and cellular biology of the potato*. Wallingford, Oxon, UK: CAB International, 1990.
3. G. Bruening et al. *Tailoring Genes for Crop Improvement: An Agricultural Perspective*. New York: Plenum Press, 1987.

Plant Illustration as a Taxonomical Research Tool [2L3]

The *Illustrations of the Genus Carex* (1858-67) is an example of highly specialised botanical representation. With over 600 figures, it represents very detailed parts of sedge plants (NL: zegge), demonstrating tiny variations relevant for taxonomic identification. For these purposes, line drawings in a large format, allowing space for life-size or magnified detail served best.

Clearly, this is neither a coffee table book, nor a field guide. It is the work of American-British physician-botanist Francis Boott (1792-1863) and was published at his own expense over almost a decade. Several sedge species were identified by Boott and now carry his name.

On display:

Boott, F. *Illustrations of the Genus Carex*. Lehre: Cramer, 1968.

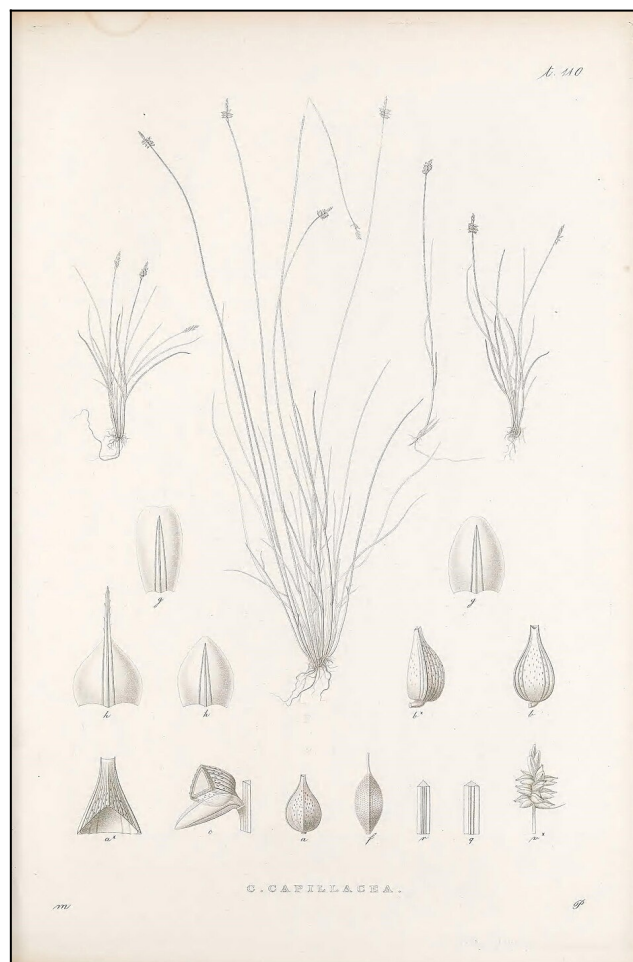


Figure 12: *Carex capillacea* in F. Boott, *Illustrations of the genus Carex*, 1858.

The Ecological Perspective [2L4]

Ecology offers a different perspective on plants. Books with a taxonomic interest typically represent species in isolation. Plant parts may be added separately for physiological or identifying importance. By contrast, books about plant ecology represent plants in their natural relations such as communities of plants that typically grow together. Flower details serve to demonstrate pollination, rather than identification. For these purposes, some books prefer photographs, even at the expense of botanic detail. In contrast, plant atlases show how plants are distributed, taking the ecological interest to an even larger scale in the form of maps. The ecological floras illustrate how a different understanding of plants also requires a different representation.

On display:

1. Weeda, E.J., and C.G.M. van Deursen. *Nederlandse oecologische flora: wilde planten en hun relaties*. Amsterdam: KNNV Uitgeverij; IVN, 2003.
2. Haeupler, H., P. Schönfelder, and F. Schuhwerk. *Atlas der Farn- und Blütenpflanzen der Bundesrepublik Deutschland*. Stuttgart: Eugen Ulmer, 1988.

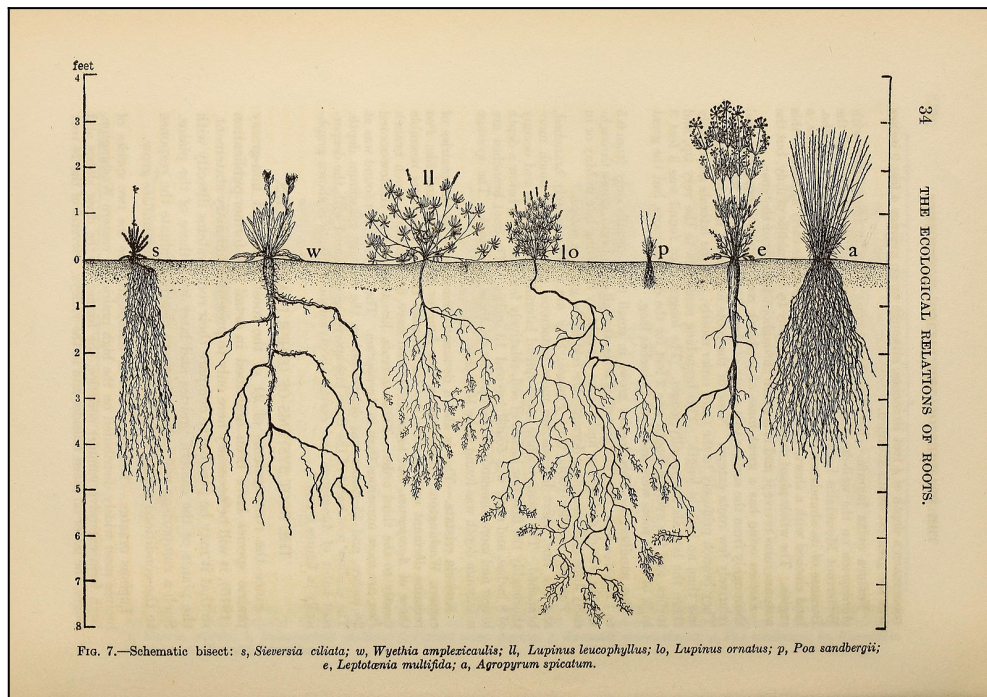


Figure 13: Illustration from J. E. Weaver, *The ecological relations of roots*, 1919.

Mystical Plants

Flora Diabolica [2R1]

The 1924 *Flora Diabolica* describes the intricate relationship between plants and demonology in folklore. The work explores how, during the 13th and 14th centuries, certain trees, shrubs, and herbs were believed to harbour demonic entities or were manipulated by the devil to achieve malevolent ends. Conversely, the book also discusses "holy" plants believed to repel or combat these dark forces, to provide a comprehensive study that appeals to botanists, folklorists, and those intrigued by the cultural narratives surrounding plant life.

On display:

Teirlinck, Isidoor. *Flora diabolica: de plant in de demonologie Plantloristische studiën*. Antwerpen: "De Sikkel", 1924.

Flora of the Bible [2R1]

Beyond scientific botany, some works explore plants through the lens of faith and scripture, describing the flora mentioned in the Bible. These are not botanical textbooks, but guides to enrich biblical reading. Since the authors are not botanists, the illustrations, though evocative, are not biologically accurate, but serve to bring biblical landscapes to life, with simple line drawings.

The flora of the Bible — fig trees, olive branches, hyssop, myrrh, and wheat — hold deep symbolic meaning. These guides offer botanical descriptions, but highlight historical references and meaning, clarifying biblical passages, stressing plants' cultural significance over their biology.

On display:

1. Møller-Christensen, Vilhelm, and K. E. Jordt Jørgensen. *Plantenleven in de Bijbel*. 3. Druk. Baarn: Bosch & Keuning N.V., 1962.
2. Moldenke, Harold N., and Alma L. Moledenke. *Plants of the Bible*. Waltham, Mass.: Chronica Botanica Co., 1952.

Nationalistic Nature

Although plants do not care much about national borders, many floras do describe national botanies. This may make sense for remote places with a unique flora, like Hawaii. For places like the Netherlands, with its boundaries set by accidental history, delineating plants or even wildlife in general as being “of the Netherlands” has little biological meaning.

The idea of a national flora ran parallel to the creation of the nation state, particularly during the 19th century, culminating in the protection of nature as national heritage. Still, the national flora remains a genre to this day and has generated wondrous and beautiful botanical books.

On display:

1. Martin, W. Keble, and D.H. Kent. *The Concise British Flora in Colour*. London: Ebury Press, 1972.
2. Kuck, Loraine, and Richard C. Tongg. *Hawaiian Flowers & Flowering Trees: A Guide to Tropical & Semitropical Flora*. Rutland, VT [etc.]: Tuttle, 1960.

Wild Flowers of Greece [2R2]

Wild Flowers of Greece (1968) is a landmark botanical work celebrating Greece’s extraordinary flora — one of Europe’s richest and most diverse. This large folio volume features 122 life-size watercolour plates by acclaimed botanical artist Niki Goulandris. The accompanying text by amateur botanist Constantine Goulimis provides botanical descriptions, flowering periods, habitats, and distribution details and medicinal uses.

Through extensive expeditions, Goulimis discovered 230 new species.

The work of these authors was a major contribution to Greek botany and a testimony of their botanical passion. The Goulandris Museum of Natural History, founded in 1965, continues their legacy in environmental education and research.

On display:

Goulandris, Niki A., Constantine N. Goulimis, and William T. Stearn. *Wild Flowers of Greece*. Kifissia, Greece: Goulandris Botanical Museum, 1968.

Field Guides

Field guides have their own specific concerns for representing plants. The guides have to be portable and handy so they can be taken outdoors, while also catering to the specific needs and skills of their users. What is a 'good' representation of a plant therefore also depends on the user.

For the absolute beginner, it might make sense to highlight easily visible characteristics, such as flower colour. Advanced users might prefer stylised black-and-white line drawings that give prominence to taxonomically distinctive features. Plant field guides typically target users in a particular area, such as countries, regions, or even cities.

***HH&T: A Dutch Botanical Classic* [2R4]**

In 1899, Heimans, Heinsius & Thijssse's *Geïllustreerde Flora van Nederland* (*HH&T*) was published as the Netherlands' first ever illustrated flora. Over 95 years and 23 editions, it continued to evolve significantly, though always retaining its signature oblong format.

Like Heukels' *Flora*, it adopted the Eichler classification system, but in a far more accessible way. Avoiding technical terminology and with determination tables focusing on easily visible plant characteristics, it became the go-to for curious nature lovers. Its authors were initiators of Dutch nature conservation and the flora was part of their educational campaign to promote public appreciation for nature.

On display:

E. Heimans, Eli, Hein W. Heinsius, Jacobus (Jac) P. Thijssse, and Jacobus Heimans. *Geïllustreerde flora van Nederland: handleiding voor het bepalen van den naam der in Nederland in het wild groeiende en verbouwde gewassen en van een groot aantal sierplanten*. 4^e verb. dr. Amsterdam: Versluys, 1916; and 21^e dr., 1965.

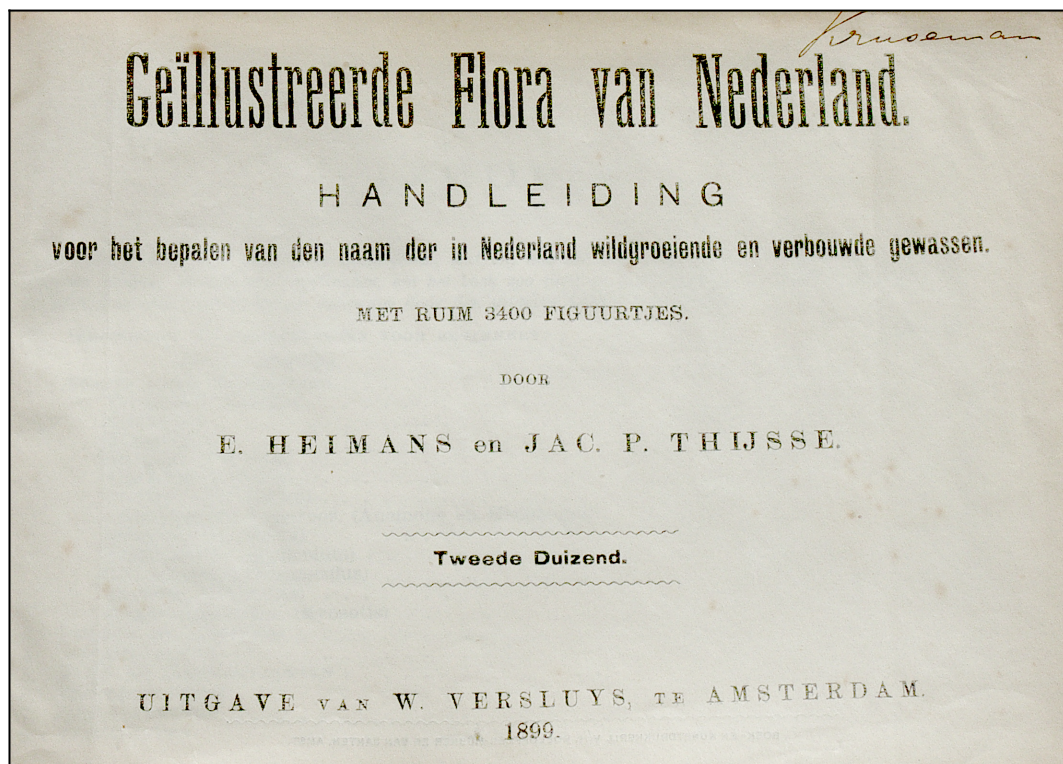


Figure 14: Heimans, Heinsius, and Thijssse, *Geïllustreerde Flora van Nederland* (first edition), 1899.

Heukels' *Flora van Nederland* [2R4]

First published in 1883, Heukels' *Flora van Nederland* became the definitive guide to Dutch plant life, known for its scientific rigor and detailed botanical illustrations. Its intricate line drawings highlighted key structural details necessary for accurate identification. While technical in nature, its visual appeal played a crucial role in shaping how plants were studied and identified in the Netherlands.

Even today, Heukels' *Flora* remains a cornerstone of Dutch botany. While modern digital tools have changed the way plants are documented, its legacy lives on in the tradition of beautifully illustrated field guides that continue to inspire botanists and nature lovers alike.

On display:

Heukels, Hendrik. *Geïllustreerde Schoolflora Voor Nederland*. Groningen-Batavia: P. Noordhoff N.V., 1942.

City Flora [2R4]

Historically, floras were guides to the botany of a particular region or country, often with a hint of national pride. The *Stadsflora* demarcates its domain differently: it is the guide to the urban environment, though restricted to the Low Countries.

Surprisingly, cities contain up to three quarters of our native plant species, due to its unique environmental conditions. Interest in urban nature is increasing, driven by a need for greener, more sustainable and liveable cities. The *Stadsflora* continues the flora's educational tradition with suggestions for city walks and photographs of plants in their urban environments, in contrast to guides that prioritised determination.

On display:

Denters, Ton, Filip Verloove, and Claud Biemans. *Stadsflora van de Lage Landen*. Edited by Aafke van Nierop. Amsterdam: Fontaine Uitgevers, 2020.

The Future [2R4]

Nowadays, many functions of printed field guides are replaced by digital tools. Apps like *Obsidentify* provide basic identification in the field via mobile phone cameras. They easily link to detailed background information, or allow plant enthusiasts to report species to databases like *Waarneming.nl*. Universal alternatives like *INaturalist* serve similar purposes.

Such apps hardly have to worry about bulkiness, as makers of printed guides had to. Though also including pictures, these are mostly photographs, often selected for aesthetic and photographic qualities, rather than drawn figures that facilitate identification. Hence flora's art is not dead — it simply has transformed once again.

The *Obsidentify* app
via *Waarneming.nl*:



Conclusion

The evolution of botanical illustration in books reflects a fascinating intersection of art, science, and utility, with shifting purposes and illustrative styles corresponding to the needs and cultural contexts of different periods. The trajectory of botanical illustration mirrors humanity's changing relationship with nature — from utility to admiration, to study, and finally, to conservation and advocacy for nature protection.

Acknowledgements

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Support and materials: *Library of Science*.

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Figures

Cover. Maria Sibylla Merian. Illuminated Copper-engraving from *Metamorphosis insectorum Surinamensium*, Plate XXIII. 1 January 2008. Accessed June 3, 2025.
https://commons.wikimedia.org/wiki/File:Merian_Metamorphosis_XXIII.jpg

Figure 1: Pimpernel in Dioscodides, the *Codex Neapolitanus*, 7th century. Anagallis, Naples Dioscorides. 2 October 2025. Accessed June 3, 2025.
https://commons.wikimedia.org/wiki/File:Anagallis_Naples_Dioscorides.jpg

Figure 2: Aurea mala in R. Dodoens *Stirpium Historiae Pemptades Sex*, 1583. Aurea mala, page 455. 28 September 2012. Accessed June 3, 2025.
https://commons.wikimedia.org/wiki/File:Aurea_mala_455_Dodoens_1583.png

Figure 3: Ehret's sheet for Linnaeus' sexual system for the description of plants. Georg Dionysus Ehret. Linnaeus' sexual system for the description of plants. 13 September 2024. Accessed June 3, 2025.
https://commons.wikimedia.org/wiki/File:Ehret,_George_Dionysius__Linnaei_Methodus_plantarum_sexualis,_1736.jpg

Figure 4: Plate XLIII. Maria Sibylla Merian. Colored copper engraving from *Metamorphosis insectorum Surinamensium*, Plate XLIII., 1705. 11 April 2009. Accessed June 3, 2025.
<https://commons.wikimedia.org/wiki/File:Avicularia-avicularia.jpg>

Figure 5: Plate XXIII. Maria Sibylla Merian. Illuminated Copper-engraving from *Metamorphosis insectorum Surinamensium*, Plate XXIII. *Solanum mammosum* 1705. 1 January 2008. Accessed June 3, 2025.
https://commons.wikimedia.org/wiki/File:Merian_Metamorphosis_XXIII.jpg

Figure 6: Plate LX. Maria Sibylla Merian. Illuminated Copper-engraving from *Metamorphosis insectorum Surinamensium*, Plate LX. 1705. 1 January 2008. Accessed June 3, 2025.
https://commons.wikimedia.org/wiki/File:Merian_Metamorphosis_LX.jpg

Figure 7: Plate XLVIII. Maria Sibylla Merian. Illuminated Copper-engraving from *Metamorphosis insectorum Surinamensium*, Plate XLVIII. 1705. 1 January 2008. Accessed June 3, 2025.
https://commons.wikimedia.org/wiki/File:Merian_Metamorphosis_XLVIII.jpg

Figure 8: Plate I. Maria Sibylla Merian. Illuminated Copper-engraving from *Metamorphosis insectorum Surinamensium*, Plate I. 1705. 22 October 2015. Accessed June 3, 2025.
[https://commons.wikimedia.org/wiki/File:Metamorphosis_insectorum_surinamensium_\(Pl._1\)_BHL41398750.jpg](https://commons.wikimedia.org/wiki/File:Metamorphosis_insectorum_surinamensium_(Pl._1)_BHL41398750.jpg)

Figure 9: Plate XXVII. Maria Sibylla Merian. Illuminated Copper-engraving from *Metamorphosis insectorum Surinamensium*, Plate XXVII. 1705. 1 January 2008. Accessed June 3, 2025.
https://commons.wikimedia.org/wiki/File:Merian_Metamorphosis_XXVII.jpg

Figure 10: Geum urbanum in J. Kops, *Flora Batava*, 1800. Jan Kops. *Flora Batava*, Volume 1 (1800). 29 March 2012. Accessed June 3, 2025.
https://commons.wikimedia.org/wiki/File:Geum_urbanum_%E2%80%94_Flora_Batava_%E2%80%94_Volume_1.jpg

Figure 11: Large-fruited Eucalyptus, or Gum-Tree (*eucalyptus macrocarpa*) in W. H. Fitch, *Curtis's Botanical Magazine*, 1847. Walter Hood Fitch. Plate from *Curtis's Botanical Magazine*, Volume 73. Title: *Eucalyptus macrocarpa*. Large-fruited Eucalyptus, or Gum-Tree. 15 April 2009. Accessed June 3, 2025.
[https://commons.wikimedia.org/wiki/File:Curtis%27s_Botanical_Magazine,_Plate_4333_\(Volume_73,_1847\).jpg](https://commons.wikimedia.org/wiki/File:Curtis%27s_Botanical_Magazine,_Plate_4333_(Volume_73,_1847).jpg)

Figure 12: *Carex capillacea* in F. Boott, *Illustrations of the genus Carex*, 1858. Biodiversity Heritage Library. Illustrations of the genus *Carex*. 5 September 2019. Accessed June 3, 2025.
https://commons.wikimedia.org/wiki/File:Carex_capillacea_N310_w1150.jpg

Figure 13: Illustration from J. E. Weaver, *The ecological relations of roots*, 1919. John Earnest Weaver. Figure 7 from "The Ecological Relations of Roots" (1919) by John Ernst Weaver. 20 July 2019. Accessed June 3, 2025.
[https://commons.wikimedia.org/wiki/File:The_ecological_relations_of_roots_\(1919\)_14586807078.jpg](https://commons.wikimedia.org/wiki/File:The_ecological_relations_of_roots_(1919)_14586807078.jpg)

Figure 14: Heimans, Heinsius, and Thijssse, *Geïllustreerde Flora van Nederland* (1st edition), 1899. J. Anacht. Title page of first edition of *Geïllustreerde Flora van Nederland*. 18 February 2009. Accessed June 3, 2025. https://commons.wikimedia.org/wiki/File:Ge%C3%AFll_flora_van_NL_1ste_druk.JPG