

The Cactician

ISSN 2052-952X



15. Commentary on the taxonomic value of the Ehret, Van Huysum, and Wm. Sartorius illustrations in the archive of the Royal Society of succulent plants grown by Philip Miller at the Chelsea Physic Garden in the eighteenth century.

ORIGINAL RESEARCH PAPERS ON A MISCELLANY OF TOPICS ON THE SUBJECT OF SUCCULENT PLANTS AUTHORED AND EDITED BY ROY MOTTRAM (except where stated)

Taxonomy
Botanical History
Databases

**Commentary on the taxonomic value of the Ehret,
Van Huysum, and Wm. Sartorius illustrations in the
archive of the Royal Society of succulent plants
grown by Philip Miller at the Chelsea Physic Garden
in the eighteenth century.**

Roy Mottram

Roy Mottram Whitestone Gardens, Sutton, Thirsk,
North Yorkshire YO7 2PZ, U.K.
roymottram900@btinternet.com

9 Jun 2021

There are no new names in this article, but 11 new
lectotypifications and one new epitype are proposed. These
cannot be reproduced here because images of them are strictly
licenced, but they can be viewed in high resolution at
<https://prints.royalsociety.org/search?q=botany&type=product>

Publisher: Roy Mottram
Whitestone Gardens,
Sutton, Thirsk,
North Yorkshire YO7 2PZ, U.K.
in association with the International Crassulaceae Network
c/o Margrit Bischofberger
Guggenbühlstrasse 20
CH-8355 Aadorf
Switzerland.

Tel: 0044 (0) 1845 597467
Email: roymottram900@btinternet.com

Tel: 0041 (0) 52 212 71 72
Email: margrit.bischofberger@enersol.ch
url: www.crassulaceae.ch

Summary & introduction.

The name of Philip Miller (1691-1771), son of a London market gardener, was almost synonymous with English gardening in the early eighteenth century. Linnaeus dubbed him “Hortulanorum princeps”, the prince of gardeners. After a career working on his father’s garden near Deptford, then as a commercial florist near Southwark, he was appointed to run the botanical garden founded in 1673 at Chelsea for the Society of Apothecaries, 1722-1771. This was at a time when succulent plants were being discovered and sent to Europe from the Caribbean and South Africa. They were cultivated in European botanic gardens, and usually first described by botanists associated with those gardens. Miller was no exception, and although he recorded them in his numerous dictionaries of the Chelsea Physic Garden, and preserved dried material in his private herbarium, many of his own contributions to nomenclature are still not fully understood.

There are no reliable images of Philip Miller known. The portrait claimed to be him (**Fig. 1**) published in the edited French edition of his *Dictionary* in 1785, was not of Philip Miller.

Thomas Martyn, a contemporary and friend, commented on this that “a fancy portrait of the author in ... a bag wig and ruffles, a costume which must appear truly ridiculous to such as remember the plain old-fashioned English dress in which Mr. Miller always appeared”. It is actually a portrait of John Miller (né Johannes Sebastian Mueller, 1715-c.1792) and a similar portrait had appeared in 1777 captioned as Johannes Miller in the frontispiece of his *Illustratio systematis sexualis Linnaei*. John Miller worked closely with Philip Miller as a botanical artist and engraver with skills almost comparable with those of Ehret. The engraver of the French *Gardeners Dictionary*, Maillet, appears to have copied and embellished that self-portrait.

The unknown ‘Portrait of a gentleman in a brown coat’ in the archives of the Royal Society (RS-9726) might possibly be Philip Miller, but we have no way of knowing with any certainty. The plain English dress in Martyn’s description is, however, very evident in this portrait.



Fig. 1 Frontispiece of Miller, P. & Chazelles, M. de (1785) *Dictionnaire des jardiniers*, Paris. The engraver, Maillet, has mistakenly copied in the wrong portrait.



Miller's preserved materials.

Miller's personal herbarium of almost 10,000 specimens (Dandy 1958: 167) was acquired by Hans Sloane and transferred to the British Museum in 1781. He also supplied 50 herbarium specimens per year to the Society of Apothecaries.

In addition to this, Miller commissioned botanical artists to regularly record plants with works of art at the request of the Apothecaries Society. Miller liked succulent plants, thinking them very curious, and recorded most of them in this way. Artists included Jacob van Huysum and William Sartorius, but the most important was the hugely talented Georg Dionysius Ehret (1708-1770) (**Fig.2**), said by many to be the best botanical artist of his time.

Georg Dionysius Ehret

Ehret was born and raised in Heidelberg, son of a gardener who passed on his horticultural and artistic skills. He first met Philip Miller and Hans Sloane on a visit to London in 1735, and made some drawings in the Chelsea Physic Garden of new plants for his patron Dr. Trew. He returned to London in 1736, which became his permanent home, and in 1738 he became related to the Miller family by marrying Mrs. Miller's sister, Susanna Kennet.

Fig.2 Georg Dionysius Ehret c.1767. Portrait age 59 in oil on canvas by George James, with *Cestrum diurnum* L. Bequeathed to the Linnean Society, London, by Sir Arthur Evans in Aug 1941. Label on the back reads: "This portrait of Georg Dionysius Ehret came to the Rev. H. M. Grover upon the death of his mother Sibylla Grover, the eldest daughter of Geo. Phil. Ehret of Watford, who was the only son of the great artist G. D. Ehret."

Reproduced here with the kind permission of The Linnean Society of London.

During his time in England he received the patronage of the Royal physician, Richard Mead, the Duchess of Portland, and John Fothergill, all of whom procured large collections of his drawings (Henrey, 1975: 63). In 1749, he began to give private instruction in the painting of plants and flowers to the British aristocracy. Ehret lived in Oxford from 1750 to 1755, briefly as the head gardener at Oxford Botanic Garden, while continuing teaching botany and flower painting, then afterwards, he returned to London.

Ehret's drawings, said to exceed 3000 in all, were sometimes published but many were not. He received an income from executing commissions to supplement his gardening and teaching salaries. Philip Miller and Christoph Jacob Trew had plants drawn simply as a permanent botanical record of their plants when they flowered – visual herbaria. Throughout his career, Ehret was inventive in developing his style and techniques. Before 1735 his work was in watercolour on paper, then later he painted in body-colour on vellum, a technique he learned while in Paris, in the winter of 1734-35. It was also then that he developed his own particular way of signing his work, which then never changed for the rest of his life. However, Ehret's drawings, now in the Trew collection at Erlangen, are unsigned.

Ehret's original illustrations are today housed in many institutions. Calman lists 14 institutions which hold original work. Our interest here is drawn to those in the Royal Society Library, acquired in 1737, where there is a folio of 35 drawings of plants. 28 are by Ehret of which 22 are succulents, 7 by Jacob van Huysum, commissioned by Philip Miller on behalf of the Society of Apothecaries. Another folio, by van Huysum and William Sartorius, contains 3 drawings of cacti. In the depiction of aloes, strangely both van Huysum and Ehret figured some of the very same plants at the same time, executed from exactly the same angle, but in such cases Ehret's images invariably outshine those of his friend.

Jacob van Huysum (1687-1740) had settled in England in the hope of making a living, but took to heavy drinking that hastened his demise.

Ehret was elected a Fellow of the Royal Society on 19 May 1757, and elected a member of the Imperial German Academy of Naturalists on 10 Sep 1758.

Acknowledgements

The Linnean Society of London is thanked for the supply of and permission to show the portrait in Fig. 1. Katherine Marshall, The Royal Society, London, is also thanked for information provided.

Selected Bibliography & Literature cited:

- Bayer, M. B. (1999) *Haworthia revisited: A revision of the genus*. Umdaus Press, Hatfield.
- Bayer, M. B., & Van Jaarsveld, E. (2020) *Haworthia (Asphodelaceae)*. In: Eggli, U., & Nyffeler, R., *Illustrated handbook of succulent plants* ed.2: *Monocotyledons* **1**: 769-817. Springer-Verlag GmbH, part of Springer Nature, Berlin.
- Calman, G. (1977) *Ehret: Flower painter extraordinary*. Phaidon Press, Oxford.
- Carter, S., Lavranos, J. J., Newton, L. E., & Walker, C. C. (2011) *Aloes: The definitive guide*. Kew Publishing, Kew.
- Glen, H. F., & Hardy, D. S. (2000) *Aloaceae (First part): Aloe*. In: Germishuizen, G., *Flora of southern Africa* **5**(1): [i]-vi, 1-167. National Botanical Institute, Pretoria.
- Guglielmone, L., Gallo, L., Meregalli, M., Smith, G. F. & Figueiredo, E. 2009. *Allioni's Aloe names (Asphodelaceae): nomenclature and typification*. *Bothalia* **39**(2): 177-183. National Botanical Institute, Pretoria.
- Haworth, A. H. (1812) *Synopsis plantarum succulentarum, cum descriptionibus, synonymis, locis; observationibus anglicanis, culturae*. Richard Taylor & Soc., London.
- Henrey, B. (1975) *British botanical and horticultural literature before 1800*. 3 vols., Oxford University Press, London.
- Hermann, P. (1698) *Paradisus batavus, continens plus centum plantas affabrè aere incisas & descriptionibus illustratas. Cui accessit catalogus plantarum, quas pro tomis nondum editis, delineandas curaverat Paulus Hermannus, M. D. ... opus posthumum*. Abraham Elzevier, Leiden.

Jarvis, C. (2007) **Order out of chaos: Linnaean plant names and their types**. The Linnean Society of London & Natural History Museum, London.

Klopper, Ronell R., Smith, Gideon F., Figueiredo, Estrela, & van Wyk, Abraham E. (2016 Oct 1) **(2469-2472) Proposals to reject the names *Aloe perfoliata*, *A. obscura*, *A. picta*, and *A. perfoliata* var. *saponaria* (*A. saponaria*) (*Asphodelaceae: Alooidae*)**. *Taxon* **65**(5): 1173-1175. Allen Press Inc., Lawrence, for the International Association for Plant Taxonomy, Bratislava.

Le Rougetel, H. (1990) ***The Chelsea gardener: Philip Miller 1691-1771***. Natural History Museum Publications, London.

Lindsay, G. E. (1992) ***The taxonomy and ecology of the genus *Ferocactus****. Dissertation submitted to the Department of Biological Sciences and the Committee of Graduate Study of Stanford University in partial fulfillment of the requirements for the Degree of Doctor of Philosophy. Compiled and submitted Dec 1955. Effectively published by UMI Dissertation Services, Ann Arbor.

- (1996) **The taxonomy and ecology of the genus *Ferocactus*** in: Lindsay, G. E., Cota, H. & al., *The genus *Ferocactus**. Tireless Termites Press, Bayshore Energy Systems, Escondido, California.

Linnaeus, C. (1753) ***Species plantarum, exhibentes plantas rite cognitatas, ad genera relatas, cum differentiis specificis, nominibus trivialibus, synonymis selectis, locis natalibus, secundum systema sexuale digestas*** **1**. Laurence Salvius, Stockholm.

Mottram, R. (2013 Jun 13) **Typification and application of the name *Aloe perfoliata* L.**, *The Cactician* **1**. Privately published online, Sutton-under-Whitstonecliffe.

- (2013 Jul 27) **Linnaean cactus legacy**, *The Cactician* **3**. Privately published online, Sutton-under-Whitstonecliffe.

Mottram, R., & Hoxey, P. (2020) **An evaluation of the cacti of Charles Plumier (1646-1704)**, *The Cactician* **13** (2 Feb 2020). Privately published online, Sutton-under-Whitstonecliffe.

Newton, L. E. (2020) ***Aloe***, in Eggli & Nyffeler, *Illustrated handbook of succulent plants ed.2: Monocotyledons* **1**: 485-696. Springer-Verlag GmbH, part of Springer Nature, Berlin.

Scott, C. L. (1985) ***The genus *Haworthia* (Liliaceae): A taxonomic revision***. Aloe Books, Johannesburg.

Scott, C. L. (1985) ***The genus *Haworthia* (Liliaceae): A taxonomic revision***. Aloe Books, Johannesburg.

Taylor, N. P. (1984) **A review of *Ferocactus* Britton & Rose, *Bradleya* 2**: 19-38. British Cactus and Succulent Society, Oxford.

Toelken, H. R. (1972) **The Linnaean species of *Crassula***. *Journal of South African Botany* **38**(2): [i], 67-80. Trustees of the National Botanic Gardens of South Africa, Kirstenbosch.

Van Jaarsveld, E. (1992) **The genus *Gasteria*, a synoptic review**, *Aloe* **29**(1): 5-30. Succulent Society of South Africa, Pretoria.

- (2020) ***Gasteria* (*Asphodelaceae*)**. In: Eggli, U., & Nyffeler, R., *Illustrated handbook of succulent plants ed.2: Monocotyledons* **1**: 751-766. Springer-Verlag GmbH, part of Springer Nature, Berlin.

Wijnands, D. O. ***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***. A. A. Balkema, Rotterdam.

Annotated catalogue of the succulent plant plates in the archive of the Royal Society.

I: Image reference: **RS-9237. *Sedum montanum*, *tomentosum* C.Bauhin** [*Pinax theatri botanici*: 284. 1671]. Plate executed after 1735, by Georg Dionysius Ehret. Signed lower right; "G.D.Ehret pinxit". Inscribed verso, lower right, "1753". Pencil inscription verso: "2778/4". Identity: *Sempervivum arachnoideum* L. (1753)

Miller 1731: *Sedum* 9: *Sedum montanum*, *tomentosum* C. B. P. Cobweb Houseleek.

Miller 1768: *Sempervivum* 4: *Sempervivum arachnoideum* L. (1753).

This plate is faded and has lost much of its original colour. This suggests that it may have been one of the earliest to be executed and exposed to light at the top of a pile of sheets.

2: Image reference: **RS-17979**.

Houstoun MS polynomial: **Cereus crassissimus, spinis tenuioribus, flavescentibus, fructu sphaerico laevi** Houst. The thickest [-stemmed] cereus, with thin yellowish spines, with spherical smooth fruit. Plate executed c.1735 by William Sartorius, with pencil plate number 31, among a collection of plates by Jacob van Huysum & William Sartorius designated MS109 in the archive of the Royal Society, and annotated in ink “W Sartorius deli [delineavit]”. Identity: *Stenocereus heptagonus* (L.) Mottram (2013).

Miller 1731: Cereus 8: *Cereus maximus, fructu spinoso rubro* Par. Bat. The Greatest Torch-Thistle, with red prickly fruit. This was an adoption of Paul Hermann’s polynomial, from *Paradisus batavus* (1698: 113-114), which Hermann called ‘Dadus’, with a quite detailed description.

Linnaeus 1753: Cactus 9: *Cactus peruvianus* L.

Miller 1759: Cereus 4: *Cereus erectus octangularis, angulis obtusis, spinis robustioribus patulis*. Upright *Cereus* with eight Angles which are obtuse, and strong spreading spines. Greatest upright Torch Thistle.

Miller 1768: Cereus 4: *Cereus peruvianus* (L.) Mill. = *Stenocereus heptagonus* (L.) Mottram (2013).

Miller (1768) also recognised *Cereus* sp. *Cereus* 8 as *Cereus heptagonus* (L.) Mill. in the 7th & 8th editions, with an almost identical description, associating it each time with Boerhaave’s polynomial.

This is the Greater Dildo Tree, called “*Cereus crassissimus, fructu intus & extus rubro*” by Sloane, most notable for its thick stems and juicy scarlet fruits with deciduous spine clusters, staining the fingers with its red flesh according to Gerard.

The protologue of *Cactus heptagonus* L. contained no original material, so the application of this name is typified with uncited original material as follows: Lecto: Plumier t.25. Designated by Mottram in *The Cactician* **3**: 27 (27 Jul) 2013, and refined in a second step lectotypification with the selection of the stem fragment only in Plumier t.25. Designated by Mottram & Hoxey in *The Cactician* **13**: 63 (Feb) 2020. Linnaeus is known to have seen the Burman copy of Plumier’s drawing in in the winter of 1737-38.

The Sartorius illustration almost qualifies as original material of *Cactus heptagonus* L. because Linnaeus visited the Chelsea Physic Garden in July 1736. So there was a circumstantial opportunity for him to see it there although we have no evidence that he actually did.

The supplier to Miller of the plant figured, William Houstoun (1695-1733), M.D., F.R.S. 1732, a surgeon in the service of the South-Sea Company, gathered plants and seeds in Cuba, Jamaica, Panama, and at Vera Cruz & Campeche, Mexico, between 1729 and 1733. *Stenocereus heptagonus* occurs in Cuba, Jamaica, and elsewhere in the Caribbean, and in Mexico and northern South America. However, Houstoun’s own polynomials, usually adopted by Miller, had ‘Americana’ in the name if they were from the Caribbean, and ‘Mexicana’ if from Mexico, so that rules out Mexico in this instance and it must have been gathered in Cuba or Jamaica, probably the latter.

Houstoun bequeathed his manuscripts, drawings, and personal herbarium to Miller, from whom they passed to Sir Joseph Banks, and thence to where they are now at the British Museum (Natural History), London.

Miller had listed this taxon in the first edition of his dictionary in 1731, but with the description “*Cereus maximus, fructu spinoso rubro* Par. Bat., The Greatest Torch-Thistle, with red prickly fruit.” It remained the same in all editions of the dictionary until 1759 (7th edn), when he then seemed to have been confused by Linnaeus’s poor attempt to reorder cactus nomenclature. Miller renumbered this taxon and gave it a new polynomial. In 1768, Miller repeated that, but added the binomial of Linnaeus, *Cactus peruvianus* L. Linnaeus had very broad taxonomic concepts, abandoning many earlier names of genera, and including many disparate elements among his species. *Cactus peruvianus* L. is now believed to be a synonym of *Cactus heptagonus* L. Most botanists of the age slavishly followed the classification of Linnaeus, but Miller was not afraid to disagree. In particular, he only changed the name of *Melocactus* Tournef. to *Cactus* L., but refused to submerge the genera *Cereus*, *Opuntia*, and *Pereskia*, which were resurrected again once Linnaeus’s influence had waned.

3: Image reference: **RS-10993. Melocactus Americana, minor.** Boerh. [*Index alter plantarum* **2**: 83. 1720]. Ink and watercolour on paper plate executed after 1735, by Georg Dionysius Ehret.

Identity: *Cactus mammillaris* L. (1753) = *Mammillaria simplex* Haw. (1812) = *Mammillaria mammillaris* (L.) H.Karst. (1882). (**Fig. 3**).

Miller 1731: **Melocactus 2**: Melocactus Americana, minor. Boerh. Ind. Smaller American Melon-Thistle.

Linnaeus 1737: **Cactus 1**: Cactus subrotundus, tectus tuberculis ovatis barbatis L.

Miller 1752: **Cactus 5**: Cactus subrotundus tectus tuberculis ovatis barbatis. Lin. Hort. Cliff. Small Melon-Thistle.

Linnaeus 1753: **Cactus 1**: *Cactus mammillaris* L.

Miller 1768: **Cactus 4**: *Cactus mammillaris* L.

Probably raised from seed supplied by the botanic garden at Leiden before 1730, under a Boerhaave polynomial. With ‘Americana’ in the phrase name which means that at that time the West Indies was its place of origin. There are only two mammillarias native to the Caribbean and the nearby South American coast, *Mammillaria mammillaris* (L.) H.Karst. (1753) and *Mammillaria columbiana* Salm-Dyck (1850). Of these Ehret’s drawing is a reasonable match for plants of *Mammillaria mammillaris* in European cultivation, such as that shown in Fig. 3 here. The species in habitat is more or less globular or branches to form hemispherical clumps in habitat, elongating only when old, but in European cultivation they become cylindrical quite quickly, as demonstrated by Miller’s plant in Ehret’s drawing.



Fig.3 *Mammillaria mammillaris* (L.) H.Karst. A typical plant of cultivation with fruits to 2.3cm long. This compares well with Ehret’s illustration, though less drawn by lack of light.

4: Image reference: **RS-17978.** Houstoun MS polynomial: **Melocactus Mexicanus, spinis creberrimis corallinis latis & recurvis.** Houst. Plate in ink and watercolour on paper, c.1735, by William Sartorius. Identity: *Ferocactus recurvus* (Mill.) Borg (1937).

Miller 1739: Second volume **Melocactus 4**: Melocactus Mexicanus, spinis creberrimis corallinis latis & recurvis. Houst. Melon Thistle of Mexico, with broad flat crooked spines.

Miller 1752: **Cactus 4**: Cactus quinque-decim-angularis rotundus, spinis creberrimis corallinis latis & recurvis. Large Melon-Thistle with fifteen Angles, and broad recurved Thorns, which are of a red Colour.

Miller 1759: **Cactus 3**: Cactus subrotundus quinque-decim angularis, spinis latis recurvis creberrimis. Roundish Melon Thistle with fifteen angles, having broad recurved Spines set very close.

Miller 1768: **Cactus 3**: *Cactus recurvus* Mill. = *Ferocactus recurvus* (Mill.) Borg.

Lectotype of *Cactus recurvus* Mill. (**design. here**): Image reference RS-17978, of a plant gathered in Mexico by William Houstoun c.1731 probably near the Puebla/Veracruz boundary in the foothills of the Sierra Nevada. Executed c.1735 by William Sartorius.

Epitype (**design. here**): Mexico, Puebla, hills at Zapotitlán de Salinas, c.15km SW of Tehuacán; Sep 1951, *George LINDSAY* 2060 (CAS: DS: 374967). Originally designated as the neotype by Lindsay (1992: 119, based on 1955 thesis; 1996: 142). Lindsay also provided a photo of the plant prior to gathering (**Fig. 4**).



Fig.4 *Ferocactus recurvus* (Puebla, c.15km SW of Tehuacán) The epitype of *Ferocactus recurvus* (Mill.) Borg, prior to preservation. Photo: George Lindsay.

One of several plants sent by Houstoun from Mexico, but they were a long time on board ship and all were decayed before their arrival in England. The plant depicted was therefore dead, which probably accounts for spines being shown as denser than would normally be expected.

From Miller's vernacular description, we know that the spines were two inches (5cm) or more in length, and almost quarter of an inch (6-7mm) broad at their bases.

This image is the only known surviving original material in support of the name *Cactus recurvus* Mill., so is hereby designated as the lectotype of that name. Because it shows a depauperate specimen, an epitype is designated here to support the lectotype.

Taylor (1984: 26) treated *Ferocactus recurvus* and *F. latispinus* as the same species. Because he was not aware of the Sartorius illustration, he thought that no original material for *F. recurvus* was extant, and chose to adopt the later name *F. latispinus* for his taxon, a name of wider usage but with a similar lack of original material. Possibly they should be treated as a single taxon, but to maintain usage of *F. latispinus* a conservation proposal would now be required.

5: Image reference: **RS-10964**. Caspar Bauhin polynomial (*Pinax* 1623: 286): **Aloe vulgaris**. C.B. Ink and watercolour on paper, executed after 1735, by Georg Dionysius Ehret.

Miller 1731: **Aloe 8:** *Aloe vulgaris* C.B. [C. Bauhin ex Lam.] The common Barbados Aloe.

Linnaeus 1753: **Aloe 1:** *Aloe perfoliata* var. *vera* L. (1753: 320-321).

Miller 1759: **Aloe 2:** *Aloe foliis dentatis erectis succulentibus planis maculatis, floribus luteis in thyrsis dependentibus* [Mill.]. Aloe with erect succulent [awl-shaped] Leaves, which are plain, indented, and spotted, and yellow Flowers, growing in a loose Spike, hanging downward.

Miller 1768: **Aloe 2:** *Aloe barbadensis* Mill.

N. L. Burman published the name *Aloe vera* (L.) Burm.f. not later than 6 Apr 1768, and so just beat *Aloe barbadensis* Mill. (16 Apr 1768) as the correct name by a few days or weeks. Typified by Wijnands (1983: 127) with the illustration in Rheede (**11**: 7, t.3).

Miller (1768) validated his name for the Barbados Aloe with *Aloe vulgaris* C.Bauhin in its synonymy, without knowing that Nicolaas Burman had already beaten him to it. Miller did use the name *Aloe vera*, but misapplied that name to the Succotrine Aloe. Ehret's plate shows a typical *Aloe vera* with an unbranched inflorescence and yellow flowers. The Royal Society archive plate is the only known original material for Miller's name, so is hereby designated as its lectotype:

Lectotype of *Aloe barbadensis* Mill., *The gardeners dictionary* ed.8. 1768 (**design. here**): Image reference RS-10964, of a plant of cultivated origin in flower, captioned as *Aloe vulgaris*. C.B., executed after 1735, by Georg Dionysius Ehret.

6: Image reference: **RS-10965. *Aloe Africana, caulescens foliis spinosis, maculis ab utraque parte albicantibus notatis*. H. A. II: 9.** Ink and watercolour on paper, executed after 1735, by Georg Dionysius Ehret.

Miller 1731: ***Aloe 10***: *Aloe Africana, caulescens foliis spinosis, maculis ab utraque parte albicantibus notatis*. The common spotted African Aloe, falsely call'd The Carolina Aloe.

Miller 1759: ***Aloe 5***: *Aloe foliis latissimis amplexicaulibus maculatis, margine spinosis floribus umbellatis* [Mill.]. Aloe with very broad spotted Leaves embracing the Stalk, whose Edges are set with Spines and Flowers, growing in an Umbel.

Miller 1768: ***Aloe 5***: *Aloe disticha* Mill. nom. illeg. (Art. 53.1) = *Aloe maculata* All. [Commelijn,] *Hort. Amstel.* **2**: 9, t.5.

The name *Aloe disticha* Mill. (1768) is validly published but a later homonym of *A. disticha* L. (1753) so is illegitimate, and the name *Aloe maculata* All. (1773), based on the same illustration, thus acts as the earliest replacement name.

The cited Commelijn illustration, **2**: 9, t.5, is the lectotype of both *Aloe maculata* All. and *Aloe disticha* Mill. This lectotype was designated by Guglielmone & al. (2009), but without reference to Miller's name as replaced synonym. Ehret's plate at the Royal Society, with the additional benefits of flower detail and being in colour, would have been a better selection, but no one was aware of the plate at that time. The lectotypification of Miller's basionym is formally designated here:

Lectotype of *Aloe disticha* Mill. non L., *The gardeners dictionary* ed.8: *Aloe* No. 5. 16 Apr. 1768 (**design. here**): Commelijn, *Horti medici Amstelodamensis rariorum* **2**: t. 5. 1701, the replaced synonym of *Aloe maculata* All.

Epitype (design. Guglielmone & al. 2009: 178): Pietermaritzburg, alongside the road between Bishopstowe and Hayfields, 29°37'13.05"S; 30°26'46.13"E, 18 August 2007, Crouch 1138 (NH).

7: Image reference: **RS-10966. *Aloe Africana, caulescens foliis spinosis, maculis ab utraque parte albicantibus obscurioribus, magis glaucis quam praecedens Boerh.*** Ink and watercolour on paper, executed after 1735, by Georg Dionysius Ehret, with pencil plate number 5.

Miller 1731: ***Aloe 11***: *Aloe Africana, caulescens foliis spinosis, maculis ab utraque parte albicantibus obscurioribus, magis glaucis quam praecedens Boerh.* The large spotted African Aloe.

Miller 1759: ***Aloe 6***: *Aloe foliis latioribus amplexicaulibus maculatis margine spinosis floribus spicatis* [Mill.]. Aloe with broad spotted Leaves embracing the Stalks, whose Edges have Spines, and Flowers growing in a Spike.

Miller 1768: ***Aloe 6***: *Aloe obscura* Mill. [= *Aloe perfoliata* L.]

This is a more accurately executed plate than the lectotype illustration of *Aloe perfoliata* L. designated in an early selection by Scopoli (1783: 217-218) illustrated by Mottram (2013: 6) and helps considerably in the application of that name.

Klopper & al (2016: 1174-1175) proposed *Aloe obscura* Mill. for rejection, among other names.

This is contrary to the rules on typification because Miller never cited Dillenius and there is no evidence that he had ever seen the illustration. In particular Miller did not list Dillenius, *Hortus elthamensis* in his bibliography at the beginning of *The gardeners dictionary* ed.8, so it does not qualify as original material in accordance with Art. 9.4. Therefore in accordance with Art. 9.19 note 7, and the fact that the Ehret plate shown here is the only known original material of *Aloe obscura*, it is therefore selected here as the lectotype, superseding the choice of Klopper & al. (2016: 1174).

Lectotype of *Aloe obscura* Mill., *The gardeners dictionary* ed.8: *Aloe* No. 6. 16 Apr. 1768 (**design. here**):

Image reference RS-10964, of a plant with inflorescence, captioned as *Aloe Africana, caulescens foliis spinosis, maculis ab utraque parte albicantibus obscurioribus, magis glaucis quam procedens* Boerh., executed after 1735, by Georg Dionysius Ehret.

By the same token, the decision to reject the name in *Taxon* **66**: 1238. 2017 is entirely inappropriate and should be rescinded and removed from App. V of the *ICN*.

8: Image reference: **RS-10978. *Aloe Africana arborescens montana, non spinosa, folio longissimo plicatili, flore rubro* H.A.** Ink and watercolour on paper, executed after 1735, by Georg Dionysius Ehret, with pencil plate number 17.

Miller 1731: *Aloe 12*: *Aloe Africana arborescens montana, non spinosa, folio longissimo plicatili, flore rubro.* H[ort.]. A[mst.]. [2: 5, t.3. 1701]. The African Aloe-tree, with flat long smooth Leaves without Spines.

Miller 1759: *Aloe 7*: *Aloe foliis ensiformibus inermis ancipitibus floribus laxé spicatis caule fruticoso.* [Mill.] Aloe with Sword-shaped smooth Leaves, standing two Ways, the Flowers growing in loose Spikes, and a shrubby Stalk.

***Aloe 7*:** 1768: *Aloe plicatilis* (L.) Burm.f. (1768) [= *Kumara plicatilis* (L.) G.D.Rowley].

A taxon correctly called *Aloe plicatilis* (L.) Burm.f. (1768) with its identity beyond any doubt.

9: Image reference: **RS-10969. *Aloe Africana, caulescens, foliis glaucis, caulem amplexentibus* H. A.** Ink and watercolour on paper, executed after 1735 by Georg Dionysius Ehret, with pencil plate number 8.

Miller 1731: *Aloe 9*: *Aloe, Africana foliis glaucis, margine & dorsi parte superiore, spinosis, flore rubro.* Com. Prael. The African stalky Aloe, with glaucous serrated Leaves and red Flowers.

Miller 1754: *Aloe 13*: *Aloe Africana, caulescens, foliis glaucis, caulem amplexentibus dorso integro spinoso* Com. Rar. The African Stalk'd Aloe, or Sword Aloe.

Miller 1759: *Aloe 3*: *Aloe foliis amplexicaulibus reflexis, margine dentatis, floribus cylindricis caule fruticosa* [Mill.] Aloe with Leaves embracing the Stalks, which are reflexed and indented on their Edges, Flowers growing cylindrical, and a shrubby Stalk. Commonly called Sword Aloe.

Miller 1768: *Aloe 3*: *Aloe arborescens* Mill.

This Ehret plate of *Aloe arborescens* Mill., other than the van Huysum plate (image 27 below), and the plate from Commelijn, are the hitherto only known original material, so Ehret's illustration is used to lectotypify the taxon as follows:

Lectotype of *Aloe arborescens* Mill., *The gardeners dictionary* ed.8: *Aloe* No. 3. 16 Apr. 1768 (**design. here**):

Image reference RS-10969, of a plant with inflorescence, captioned as *Aloe Africana, caulescens, foliis glaucis, caulem amplexentibus* H. A., executed after 1735, by Georg Dionysius Ehret.

10: Image reference: **RS-10973. *Aloe Africana, caulescens, foliis glaucis brevioribus, caulem amplexentibus, foliorum parte interna & externa non nihil spinosa.* Com. Praelud. 72.** Ink and watercolour on paper, executed after 1735 by Georg Dionysius Ehret, with pencil plate number 12.

Miller 1731: *Aloe* **14**: *Aloe Africana* caulescens, foliis glaucis, brevioribus, caulem amplexantibus, foliorum parte interna & externa nonnihil spinosa. Com. Rar. The African Aloe, with the shorter glaucous Leaves, surrounding the Stalks and Spines within and outside of the Leaves.

Miller 1759: *Aloe* **17**: *Aloe sessilis* foliis brevioribus planis carnis apice triquestris marginibus inerme spinosis. Low Aloe with short plain fleshy Leaves, triangular at their Ends, and Borders set with soft Spines. This is the *Aloe Africana humilis arachnoidea*. Com. Prael. 72.

This taxon was not listed or named in Miller 1768 or 1771.

Haworth (1804: 16) gave it the name *Aloe prolifera* Haw., but then changed his mind in his *Synopsis* (1812: 80-81) where he referred it to *Aloe brevifolia* Mill., but explicitly excluding its only included element, Com. Prael. 72, which was designated by Carter & al (2011: 398) and Newton (2020: 517) as the lectotype of *Aloe brevifolia* Mill.

Added to the confusion over the right page and plate number in Commelijn, none of those plates actually looks much like *Aloe brevifolia* as presently understood. A new relectotypification is therefore proposed with an element whose identity is not in doubt.

Miller 1768: *Aloe* **8**: *Aloe brevifolia* Mill. ("brevioribus" - corrected in Errata page). Reference to Commelijn *Praeludia* 71, however, is still incorrect for this species.

Miller 1768: *Aloe* **8**: *Aloe brevifolia* Mill.

Carter & al (2011: 398; Newton (2020: 517) proposed Commelijn, *Praeludia*: 73, t.22. 1703 as the lectotype. However, Miller cited the two previous pages & plates, and plate 22 does not agree well with this plant in the sense that it is known today. Commelijn's 71, t.20 is evidently *Aloe ferox*, while 72, t.21 & 73, t.22 appear to be two forms of a hybrid, possibly *Aloe* × *nobilis* Haw. (?*A. brevifolia* × *mitriformis* ex hort.). The Royal Society plate now gives us a clear concept of Miller's application of the name, so it is proposed here that this plate should supersede that earlier designation, as follows:

Lectotype of *Aloe brevifolia* Mill., *The gardeners dictionary* ed.8: *Aloe* No. 8. 16 Apr. 1768 (**design. here**):

Image reference RS-10973, of a plant with inflorescence, captioned as *Aloe Africana*, caulescens, foliis glaucis brevioribus, caulem amplexantibus, foliorum parte interna & externa non nihil spinosa. Com. *Praelud.* 72, executed after 1735 by Georg Dionysius Ehret.

11: Image reference: **RS-10972. Aloe Africana, caulescens, foliis glaucis brevissimis foliorum sumitate interna & externa non nihil spinosa. Com. Prael. 73.** Ink and watercolour on paper, executed after 1735 by Georg Dionysius Ehret, with pencil plate number 11.

Miller 1731: *Aloe* **15**: *Aloe Africana* caulescens, foliis glaucis brevissimis, foliorum sumitate interna & externa nonnihil Spinosa. Com. Rar. The African Aloe, with shorter glaucous Leaves, surrounding the Stalks and Spines within and outside of the Leaves.

Miller 1759 onwards: Not listed by Miller.

The pencilled plate number indicates that image 11 was painted before plate number 10. Although the inflorescence agrees with that of *Aloe brevifolia* Mill., the disposition of the leaves does not match with any known species and the plant was probably a hybrid with *A. brevifolia* as one parent.

12: Image reference: **MS_668_013. Aloe Africana, humilis, spinis inermibus & verrucosis obsita. Comm. Prael.** Ink and watercolour on paper, executed after 1735 by Georg Dionysius Ehret, with pencil plate number 13.

Miller 1731: *Aloe* **16**: *Aloe Africana*, humilis, spinis inermibus & verrucosis obsita Com. Rar. The Dwarf African Aloe, with Leaves armed with Spines and Warts, commonly call'd, the Hedgehog Aloe.

Linnaeus 1753: *Aloe* **1 var. o**: Aloë foliis erectis subulatis radicatis undique inerme spinosis. Hort. Cliff. 131. Roy Lugdb. 24.

Miller 1759: *Aloe* **10**: *Aloe* foliis erectis subulatis radicatis undique inerme spinosis. Hort. Cliff. 131. Aloe with erect Awl-shaped Leaves, set with soft Spines on every Part.

Miller 1768: *Aloe 10*: *Aloe humilis* (L.) Mill. Com. Prael. 77. [Epithet stated on the Errata page].

This taxon was lectotypified by Wijnands (1983: 124) with the illustration in Commelijn, *Plantae Rariores et Exoticae*: 46, t.46. 1706. Ehret's illustration adds new original material with accurate colouring. The same plant painted by Ehret was also painted by van Huysum, and is shown here for comparison.

13: Image reference: **MS_668_014. *Aloe africana, humilis, spinis inermibus & verrucis obsita*. Com. Rar. Pl. 46.** Exactly the same plant as the last, but by a different artist, Jacob van Huysum, with pencil plate number 14.

Miller 1731: *Aloe 16*: *Aloe Africana, humilis, spinis inermibus & verrucosis obsita* Com. Rar.

Miller 1759: *Aloe 10*: *Aloe foliis erectis subulatis radicatis undique inerme spinosis*. Hort. Cliff. 131. *Aloe* with erect Awl-shaped Leaves, set with soft Spines on every Part.

Miller 1768: *Aloe 10*: *Aloe humilis* (L.) Mill. Com. Prael. 77. [Epithet stated on the Errata page].

14: Image reference: **RS-10976. *Aloe africana, humilis, foliis ex albo & viridis variegatis*. Com. Prael. 79.** Ink and watercolour on paper, executed after 1735 by Georg Dionysius Ehret, with pencil plate number 15.

Miller 1731: *Aloe 17*: *Aloe Africana humilis, foliis ex albo & viridi variegatis*. Com. Rar. The Dwarf African *Aloe*, with green and white variegated Leaves, commonly call'd, the Partridge-breast *Aloe*.

Linnaeus 1753: *Aloe 2*: *Aloe variegata* L.

Miller 1759: *Aloe 9*: *Aloe floribus pedunculatis cernuis racemosis prismaticis ore patulo aequali*. Lin. Sp. 321. *Aloe* with hanging branching Flowers, having Foot Stalks, and spreading equally at the Brim.

***Aloe 9*:** 1768: *Aloe variegata* L. (1753). Com. Prael. 79. = *Gonialoe variegata* (L.) Boatwright & J.C.Manning (2014), or *Tulista variegata* (L.) G.D.Rowley.

15: Image reference: **RS-10989. *Aloe africana, erecta, triangularis & triangulari folio viscoso*. Com. Praelud.** Ink and watercolour on paper, executed after 1735 by Georg Dionysius Ehret, with pencil plate number 28.

Miller 1731: *Aloe 18*: *Aloe, Africana erecta, triangularis & triangulari folio viscoso*. Com. Rar. The upright triangular-leav'd viscous *Aloe*.

Linnaeus 1753: *Aloe 7*: *Aloe viscosa* L.

Miller 1759: *Aloe 11*: *Aloe floribus sessilibus infundibuli formibus bilabiatis laciniis quinque revolutis: summa erecta* Lin. Sp. Plant. 322.

Miller *Aloe 11*: 1768: *Aloe viscosa* L. (1753) = *Haworthia viscosa* (L.) Haw. or *Haworthiopsis viscosa* (L.) G.D.Rowley.

Commelijn, *Praeludia botanica*: 82, t.31. 1703 was chosen as the lectotype by Scott, *The genus Haworthia*: 26. 1985. Ehret's plate is, however, a more accurate representation.

16: Image reference: **RS-10988. *Aloe africana, erecta, rotundo folio parvo & in acumen acutissimum exeunte*. Com. Prael. 83.** Ink and watercolour on paper, executed after 1735 by Georg Dionysius Ehret, with pencil plate number 27.

Miller 1731: *Aloe 19*: *Aloe, Africana erecta, rotundo folio pravo & in acumen rigidissimum in* Dictionary exeunte. Com. Rar. The upright African *Aloe*, with small sharp pointed Leaves.

Linnaeus 1753: *Aloe 5*: *Aloe spiralis* L.

Miller 1759: *Aloe 12*: *Aloe floribus sessilibus ovatis crenatis segmentis interioribus conniventibus*. Lin. Sp. Plant. 322.

Miller 1768: *Aloe 12*: *Aloe spiralis* L. (1753) = *Astroloba spiralis* (L.) Uitewaal, or *Tulista spiralis* (L.) G.D.Rowley.

This taxon was not in *Com. Rar.*, and *Com. Prael.* 83 is actually not this species but is *Astroloba robusta* Roberts Reinecke ex Molteno & al. (2017). Fortunately, this was not chosen as the lectotype, which is Dillenius, *Hortus elthamensis* (1732: 16, t.13, f.14), designated by Wijnands (1983: 128).

17: Image reference: **RS-10985. Aloe Africana margaritifera minor H. A. 2. 21.** Ink and watercolour on paper, executed after 1735 by Georg Dionysius Ehret, with pencil plate number 24.

Miller 1731: **Aloe 21**: Aloe Africana margaritifera minor H. A. The Small Pearl Aloe.

Miller 1759 onwards: Dropped as a separate taxon by Miller, but mentioned as “a smaller Sort of this [Pearl Aloe] which hath been long preserved in the English Gardens, but the manner of its flowering being the same, I suspect it to be only a Variety.”

Miller 1768: **Aloe 14**: *Aloe pumila* L. var. γ = *Aloe margaritifera* var. *minima* Ait. = *Tulista minima* (Ait.) Boatwright & J.C.Manning (2014).

As now illustrated by this plate, and by Dillenius, *Hortus elthamensis* (1732: 20, t.16, fig. 18), the lectotype designated by Wijnands (1983: 136), the concept of this taxon was just a smaller, even perhaps a less mature version of *Aloe pumila* var. *margaritifera* L. In modern times, however, the name has been misapplied to hybrids with species of *Haworthiopsis* in the south-east of its range, the nomenclature of which remains confused.

18: Image reference: **RS-10984. Aloe africana, folio in summitate triangulari, margaritifera flore subviridi H. A.** Ink and watercolour on paper, executed after 1735 by Georg Dionysius Ehret, with pencil plate number 23.

Miller 1731: **Aloe 22**: Aloe Africana, folio in summitate triangulari margaritifera, flore subviridi. H. A. [2: t.10. 1701]. The greater Pearl Aloe; vulgô.

Linnaeus 1753: **Aloe 8**: *Aloe pumila* L.

Miller 1759: Aloe floribus sessilibus bilabiatis labio superiore erecto inferiore patente. Lin. Sp. Plant. 322.

Miller Aloe 14: 1768: *Aloe margaritifera* (L.) Mill. = *Haworthia margaritifera* (L.) Haw. = *Tulista pumila* (L.) G.D.Rowley (2013).

Linnaeus cited only Commelijn, *Horti medici Amstelodamensis* **2**: 19, t.10. 1701 for this taxon, which is therefore the holotype (Art. 9.1 Note 1), or only the lectotype if the contradiction in Ex.2 is to be followed.

19: Image reference: **RS-10983. Aloe Africana, foliis longis conjugatis supra cavis margaritiferis flore rubro elegantissimo. Boerh. Ind.** Ink and watercolour on paper, executed after 1735 by Georg Dionysius Ehret, with pencil plate number 22.

Miller 1731: **Aloe 23**: Aloe, Africana foliis planis conjugatis carinatis verrucosis, caule & flore corallii colore. Boerh. Ind. [2: 131. nr. 36]. The African Aloe, with plain fleshy Leaves growing opposite, and are full of Tubercles, with red Flowers.

Miller 1759: **Aloe 20**: Aloe sessilis foliis carinatis verrucosis apice triquetris carnis. [Mill.] Low Aloe with Keel-shaped Leaves, warted on every Part, and standing two ways. This is the Aloe Africana foliis longis conjugatis supra cavis margaritiferis flore rubro elegantissimo. Boerh. Ind. Alt. p. 2, 131. commonly called Pearl-tongue Aloe.

Miller 1768: **Aloe 20**: *Aloe verrucosa* Mill. = *Gasteria verrucosa* (Mill.) Duval = *Gasteria carinata* var. *verrucosa* (Mill.) Van Jaarsv. (1992).

The only element cited in the protologue was Boerhaave's plate, which, in the absence of any other original material, is automatically the type. Van Jaarsveld (1992: 15) designated this as lectotype. However, we now know that Ehret's plate of Miller's plant had been overlooked. Moreover, this is far superior in quality and accuracy, so without hesitation the original choice is now superseded:

Lectotype of *Aloe verrucosa* Mill., *The gardeners dictionary* ed.8: *Aloe* No. 20. 16 Apr. 1768 (**design. here**):

Image reference RS-10983, of a plant with inflorescence, captioned as Aloe Africana, foliis longis conjugatis supra cavis margaritiferis flore rubro elegantissimo. Boerh. Ind., executed after 1735 by Georg Dionysius Ehret.

20: Image reference: **RS-10982. Aloe africana, foliis planis conjugatis carinatis verrucosis, caule & flore corallii colore. Boerh. Ind. Alt. 2 p.231.** Ink and watercolour on paper, executed after 1735 by Georg Dionysius Ehret, with pencil plate number 23.

Miller 1731: **Aloe 27**: Aloe Africana, foliis longis conjugatis, supra cavis margaritiferis, flore rubro elegantissimo. Boerh. Ind. The Pearl Tongue Aloe, vulgô.

Miller Aloe 20: 1759: *Aloe sessilis* foliis carinatis utrâque verrucosis bifariam versis [Mill.]. Low Aloe with Keel-shaped Leaves, warted on every Part, and standing two Ways. This is the Aloe Africana foliis longis conjugatis, supra cavis margaritifera, flore rubro elegantissimo. Boerh. Ind. Alt. p.2, 131. commonly called Pearl-tongue Aloe.

Miller Aloe 20: 1768: *Aloe verrucosa* Mill. = *Gasteria carinata* var. *verrucosa* (Mill.) Van Jaarsv. (1992). Misidentified by Royal Society as *Tulista pumila* (L.) Raf. (1840).

This is the same taxon as the above plate 19, but shows a branching inflorescence.

21: Image reference: **RS-10979. Aloe africana, flore rubro, folio maculis albicantibus an utraque parte notato. H. A.** Ink and watercolour on paper, executed after 1735 by Georg Dionysius Ehret, with pencil plate number 18.

Miller 1754: Aloe 24: Aloe Africana, flore rubro, foliis maculis albicantibus ab utraque parte notato. H. A. The Tongue Aloe.

Miller 1759: Aloe 13: Aloe sessilis foliis lingui formibus maculatis floribus pedunculatis cernuis. [Mill.] Aloe with dwarf Tongue-shaped spotted Leaves, and hanging Flowers, which have Foot Stalks. This is the Aloe Africana flore rubro folio maculis albicantibus ab utraque parte notato. H. Amst. 2. p. 15. commonly called Tongue Aloe. [This is t.8 in Commelijn, *Hortus medici Amstelodamensis* 2: 15-16, t.8]

Miller 1768: Aloe 13: *Aloe linguiformis* Mill. = *Gasteria disticha* (L.) Haw.

The only known material to date has been the cited Commelijn, *Hortus medici Amstelodamensis* 2: 15-16, t.8, which is the lectotype of *Aloe disticha* L., and also of *Aloe linguiformis* Mill. if Art. 9.1 is applied. Ehret's plate is newly discovered original material and a more accurate representation of Miller's species, which justifies a relectotypification.

Lectotype of *Aloe linguiformis* Mill., *The gardeners dictionary* ed.8: Aloe No. 13. 16 Apr. 1768 (**design. here**):

Image reference RS-10979, of a plant with inflorescence, captioned as Aloe africana, flore rubro, folio maculis albicantibus ab utraque parte notato. H. A., executed after 1735 by Georg Dionysius Ehret.

22: Image reference: **RS-10980. Aloe Africana, foliis planis latioribus conjugatis, carinatis, flore rubro.** Ink and watercolour on paper, executed after 1735 by Georg Dionysius Ehret, with pencil plate number 19.

Miller 1759: Not in Miller's dictionary, but the phrase name is Miller's own and has the style of his polynomials introduced in the revised 7th Edition.

This has characters of *Gasteria carinata* and/or *G. verrucosa* and might be a hybrid between the two. Gasterias do tend to hybridise freely in cultivation unless precautions are undertaken to eliminate insects, and germinate spontaneously around the female parent. This is perhaps one such example.

Titled incorrectly as "Aloe Africana arborescens" by the Royal Society, with the erroneous phrase name of *A. plicatilis* and said to be unidentified.

23: Image reference: **RS-10987. Aloe africana, brevissimo crassissimoque folio, flore, subviridi. Hort. Amst. 2. 11.** Ink and watercolour on paper, executed c. 1735 by Jacob van Huysum, with pencil plate number 26.

Miller 1731: Aloe 32: Aloe Africana, brevissimo crassissimoque folio, flore subviridi. H. A. The Cushion Aloe.

Linnaeus 1753: Aloe 6: *Aloe retusa*.

Miller 1759: Aloe 19: Aloe floribus sessilibus triquetris bilabiatis labio inferiore revoluto. Lin. Sp. Plant. 322.

Aloe 19: 1768: *Aloe retusa* L. = *Haworthia retusa* (L.) Duval. Hort. Amst. 2: 11[, t.6].

Miller and the van Huysum plate cited the phrase name of Commelijn, whose t.6 is the lectotype of *Haworthia retusa* (L.) Duval, designated by Wijnands (1983: 136).

24: Image reference: **RS-10967. *Aloe succotrina, angustifolia, spinosa* flore purpureo. Breyn. Prod.** [= Breyne Prodr. (1689: 12)]. Ink and watercolour on paper, executed after 1735 by Georg Dionysius Ehret, with pencil plate number 6.

Miller 1731: ***Aloe 37:*** Aloe, Indiae Orientalis, serrata, succotrina vera, flore Phoenicio. H.Beaum. The Succotrine Aloe.

Linnaeus 1753: ***Aloe 1:*** *Aloe perfoliata* var. ξ .

Dropped by Miller from all editions of his dictionary after 1754 in favour of the name *Aloe vera*, considering them to be the same species, which it superficially resembles. This is an accurate portrayal. Nr. 24 & 25 are the same plant figured by van Huysum, but they are very crude and would not be recognisable if they were not captioned.

25: Image reference: **RS-10968. *Aloe succotrina, angustifolia, spinosa* flore purpureo. Breyn. Prod.** [= Breyne Prodr. (1689: 12)]. Ink and watercolour on paper, executed c. 1735 by Jacob van Huysum, with pencil plate number 7.

Miller 1731: ***Aloe 37:*** Aloe, Indiae Orientalis, serrata, succotrina vera, flore Phoenicio. H.Beaum. The Succotrine Aloe.

Linnaeus 1753: ***Aloe 1:*** *Aloe perfoliata* var. ξ .

Dropped by Miller from all editions of his dictionary after 1754 in favour of the name *Aloe vera*, which he considered to be the same species.

26: Image reference: **RS-10970. *Aloe succotrina, angustifolia, spinosa* flore purpureo. Breyn. Prod.** [= Breyne Prodr. (1689: 12)]. Ink and watercolour on paper, executed c. 1735 by Jacob van Huysum, with pencil plate number 9.

Miller 1731: ***Aloe 37:*** Aloe, Indiae Orientalis, serrata, succotrina vera, flore Phoenicio. H.Beaum. The Succotrine Aloe.

Linnaeus 1753: ***Aloe 1:*** *Aloe perfoliata* var. ξ .

Dropped by Miller from all editions of his dictionary after 1754 in favour of the name *Aloe vera*, which he considered to be the same species.

27: Image reference: **RS-10971. *Aloe africana, caulescens, folio crasso, obscuri viridi, spinis ad latera & in dorso armato. Boerh. Ind. Alt. ii: 131.*** Ink and watercolour on paper, executed after 1735 by Georg Dionysius Ehret, with pencil plate number 10.

Miller 1731: ***Aloe 28:*** Aloe, Africana caulescens, folio crasso, obscure viridi spinis ad latera, & in dorso armato. Boerh. Ind. The stalky African Aloe, with thick dark green Leaves arm'd with Spines on the Back-side of the Leaves.

Linnaeus 1753: ***Aloe 1:*** *Aloe perfoliata* var. v. *Aloë africana mitriformis spinosa*. Dill. Elth. t.17 f.19.

Miller 1759: ***Aloe 1:*** Aloe floribus pedunculatis cernuis corymbosis sub-cylindricis. Lin. Sp. Plant. 319. i.e. Aloe with dependent Flowers, having Foot-Stalks which are ranged in a cylindrical Corymbus. This is the Aloe Africana mitriformis spinosa. Hort. Elth. 1. p.21. The Mitre-shaped Aloe.

Aloe 1: 1768: *Aloe mitriformis* Mill. Hort. Elth. 1. p.21.

The current lectotype of this species is the well known plate 17, fig. 19 from Dillenius, *Hortus elthamensis*, designated by Glen & Hardy, *Flora of Southern Africa* **5**(1): 100. 2000, as 'iconotype'. Apart from Ehret's plate, this was the only other known original material. However, the Dillenius plate does not show a very typical plant. One of the main diagnostic characters of this species is its capitate inflorescence, whereas the Dillenius plant has distinctly pyramidal racemes, suggesting possible hybridisation. Indeed, it seems to represent the same plant that was illustrated by Commelijn, *Praeludia* 72, t.21 & 73, t.22, which are both probably *Aloe* \times *nobilis* Haw. (?*A. brevifolia* \times *mitriformis* ex hort.).

The Royal Society plate now gives us a clear concept of Miller's application of the name, so it is proposed here that this plate should now supersede that earlier designation, as follows:

Lectotype of *Aloe mitriformis* Mill., *The gardeners dictionary* ed.8: *Aloe* No. 1. 16 Apr. 1768 (**design. here**):

Image reference RS-10971, of a plant with inflorescence, captioned as *Aloe africana*, caulescens, folio crasso, obscuri viridi, spinis ad latera & in dorso armato. Boerh. Ind. Alt. II: 131, executed after 1735 by Georg Dionysius Ehret, with pencil plate number 10.

28: Image reference: **RS-10970. *Aloe africana*, caulescens, foliis glaucis, caulem amplexantibus. H. A.** Ink and watercolour on paper, executed after 1735 by Georg Dionysius Ehret, with pencil plate number 9.

Miller 1731: *Aloe 9*: *Aloe*, Africana foliis glaucis, margine & dorsi parte superiore, spinosis, flore rubro. Com. Prael. The African stalky *Aloe*, with glaucous serrated Leaves and red Flowers.

Miller 1754: *Aloe 13*: *Aloe* Africana, caulescens, foliis glaucis, caulem amplexantibus dorso integro spinoso Com. Rar. The African Stalk'd *Aloe*, or Sword *Aloe*.

Miller 1759: *Aloe 3*: *Aloe* foliis amplexicaulibus reflexis, margine dentatis, floribus cylindricis caule fruticosa [Mill.] *Aloe* with Leaves embracing the Stalks, which are reflexed and indented on their Edges, Flowers growing cylindrical, and a shrubby Stalk. Commonly called Sword *Aloe*.

Miller 1768: *Aloe 3*: *Aloe arborescens* Mill.

See image for the equivalent, more superior plate by Ehret, RS-10969 which has now been designated as the lectotype for *Aloe arborescens* Mill.

29: Image reference: **RS-10986. *Aloe africana* Arachnoidea. Com. Prael.** Ink and watercolour on paper, executed after 1735 by Georg Dionysius Ehret, with pencil plate number 25.

Miller 1731: *Aloe 24*: *Aloe*, Africana minima, atroviridis, spinis herbaceis numerosis ornata. Boerh. Ind. The least African *Aloe*, with dark green Leaves, which are set very thick, with greenish Spines.

Miller 1759: *Aloe 18*: *Aloe* foliis ovato-lanceolatis carnosius apice triquetris angulis inferne dentatis. Hort. Cliff. 131. *Aloe* with oval Spear-shaped fleshy Leaves, having three Angles at their Extremities, which are indented and set with soft Spines.

Miller 1768: *Aloe 18*: 1768: *Aloe herbacea* Mill. = *Haworthia herbacea* (Mill.) Stearn.

There is a problem with the usual typification of this taxon, which is generally accepted as being the plate in Boerhaave (1720 2: 131). However, it does not depict *Aloe herbacea* Mill., which is mostly solitary stemmed, and has a characteristically strong, sturdy and unbent inflorescence, exactly as shown by Commelijn, *Praecludia* (1703: 78, t.27), chosen by Scott (1985: 66) to typify *Haworthia arachnoidea* which he thought was the same taxon as *H. herbacea*. Rather Boerhaave shows something akin to *Haworthia marumiana* Uitew. with a much flimsier inflorescence. This taxon therefore requires a relectotypification to supersede that of Bayer (1999: 84).

Lectotype of *Aloe herbacea* Mill., *The gardeners dictionary* ed.8: *Aloe* No. 18. 16 Apr. 1768 (**design. here**):

Image reference RS-10986, of a plant with inflorescence, captioned as *Aloe africana* Arachnoidea. Com. Prael., executed after 1735, by Georg Dionysius Ehret.

30: Image reference: **RS-10977. *Aloe africana*, humilis, foliis ex albo & viridis variegatis. Com. Praelud. 79.** Ink and watercolour on paper, executed c. 1735 by Jacob van Huysum, with pencil plate number 16. The plant depicted here was misidentified by the artist, and his caption is wrong. It should read:

Miller 1759: Figures 2: t.192 (LT). *Aloe foliis linguiformibus variegatis, floribus pedunculatis cernuis, ore inaequali*. Narrow-leaved Spotted Tongue Aloe. The 1759 plate is the lectotype of *Gasteria pulchra* (Aiton) Haw.

Aiton 1789: Aloe 9: 1807: Aloe maculata var. pulchra Aiton.

This plant is correctly called *Gasteria pulchra* (Aiton) Haw., and the plate by J. Miller in Miller's *Figures* is an accurate representation. Van Huysum's plate, however, is not well executed. It shows an old plant that has lost its basal leaves which are deciduous. It shows the green-tipped flowers that are typical of gasterias, not present in most flowers of *Aloe variegata*. There is a characteristic upturning of the flowers of *Gasteria pulchra* that Van Huysum has somehow curiously overlooked.

31: Image reference: RS-10963. Cotyledon africana, frutescens, flore unbellato coccineo. Comm. Rar. 24. Ink and watercolour on paper, executed after 1735 by Georg Dionysius Ehret, with pencil plate number 2.

Miller 1731: Cotyledon 4: Cotyledon, Africana, frutescens, flore unbellato, coccineo. Com. Rar. Shrubby African Navel-wort, with Scarlet Flowers growing in an Umbel.

Linnaeus 1753: Crassula 1: Crassula coccinea L.

Miller 1759: Crassula 1: *Crassula foliis planis cartilagineo-ciliatis, basi connato vaginantibus. Vir. Cliff. 26.* Lesser Orpine, with plain Leaves, having stiff Edges set with silver Hairs, and their Base surrounding the Stalk like Sheaths. This is the Cotyledon Africana frutescens, flore unbellato Coccineo. Com. Rar. 24. Shrubby African Navelwort, with Umbels of scarlet Flowers.

Miller 1768: Crassula coccinea L.

Lectotypification of this taxon is controversial. Toelken (1972: 69) designated BM-000558479, a specimen in the Clifford herbarium, as the lectotype, on the grounds that Linnaeus marked this species in his own copy of the *Species Plantarum* ed.1, meaning that it is represented in the Clifford herbarium. The sheet itself carries no date nor any other indication that it was extant in 1753.

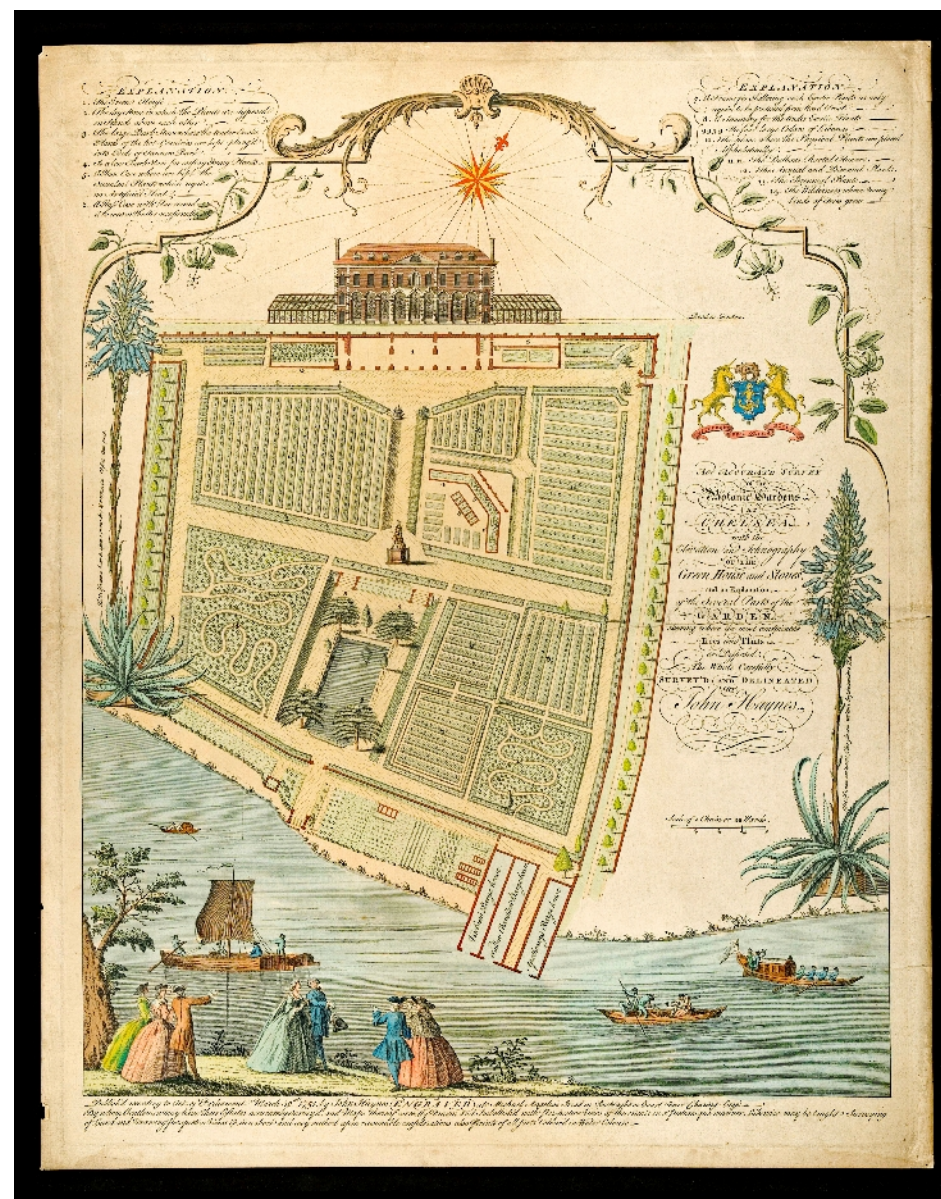


Fig. 5 Plan of the Chelsea Physic Garden published by John Haynes (30 Mar 1751). The gap in the wall at top right led to Miller's house. Image source: Wellcome Library 662588i. Public domain.

Appendix I

Bibliography of published works by Philip Miller

- Miller, Philip (1691-1771)
BIBLIOGRAPHY
- 1724 *The gardeners & florists dictionary, or a complete system of horticulture, etc.* (2 vols.) London. [Henrey 1110, TL 6035]
- 1730 *Catalogus plantarum* London ("Hort. angl." of LINNAEUS) [TL 6036]
- 1730 *Catalogus plantarum officinalium* London [TL 6037]
- 1731 *The gardeners dictionary* London. [Henrey 1101, TL 6038]. A pirated version was published in Dublin in 1732 [Henrey 1102]
- [1731]-1732 *The gardeners kalendar, directing what works are necessary to be done every month* London. Dated 1732 but published 1731 (fide Henrey) [Henrey 1124]. 3 pirated versions were published in Dublin in 1732 [Henrey 1125-1127]
- 1733 *The gardeners dictionary, ed. 2, corrected* London. [Henrey 1103, TL 6039]
- 1733 *The gardeners kalendar, ed. 2* [Henrey 1128, 1130]
- 1734 *The gardeners kalendar, ed. 3* [Henrey 1129]
- 1735 *An appendix to the "Gardeners dictionary", containing several articles which were omitted* London. [Henrey 1104, TL 6039a]
- 1735 *The gardeners dictionary, Abridged from the folio edition.* (2 vols.) octavo. London. [Henrey 1117, TL 6053]
- 1737 *The gardeners dictionary, ed. 3, corrected* London. [Henrey 1105, TL 6039b]
- 1737 *The gardeners kalendar, ed. 4* [Henrey 1131]
- 1739 *The second volume of the gardeners dictionary; which completes the work* London [Henrey 1106, TL 6040]
- 1739 *The gardeners kalendar, ed. 5* London [Henrey 1132] & Dublin.
- 1740 *The second volume of the gardeners dictionary; which completes the work, ed. 2* London [Henrey 1107, TL 6040]. Appears to differ only in the extra title page & smaller format.
- 1740 *The gardeners dictionary, abridged ed., Vol. III* [abr. from folio edn. of *The Second Volume*] oct. London. [Henrey 1118, TL 6054]
- 1741 *The gardeners dictionary, abridged ed. The second edition, corrected* 3 vols., oct. London. [Henrey 1119]
- 1741 *The gardeners dictionary, ed. 5* Dublin. A pirated issue [Henrey 1108, TL 6042]
- 1743 *The gardeners dictionary, ed. 4* (2 vols.) [Henrey 1109, TL 6041]
- 1743 *The gardeners kalendar, ed. 6* London. [Henrey 1133]
- 1745 *Groot en algemeen kruidkundig, hoveniers, en bloemisten woordenboek, etc.* (2 vols.) Leiden. Preface by Adriaan van ROYEN. [TL 6047]
- 1745 *The gardeners kalendar, ed. 7* London. [Henrey 1134]
- 1748 *The gardeners kalendar, ed. 8* London. [Henrey 1135]
- 1748 *The gardeners dictionary, abr. ed. 3* (3 vols.) octavo. London. [Henrey 1120, TL 6055]
- 1750-1758 *Das englische Gartenbuch, etc.* 3 vols. Nürnberg, German translation of ed. 5 [TL 6048]
- 1751 *The gardeners kalendar, ed. 9* London. [Henrey 1136]
- 1752 *The gardeners dictionary, ed. 6; carefully revised and adapted to the present practice* London [Henrey 1110, TL 6043]
- 1754 *The gardeners dictionary, abr. edn. 4* (3 vols.) octavo. London. [Henrey 1121, TL 6056] [Facsimile: Lehre, 1969].
- 1754 *The gardeners kalendar, ed. 10* London. [Henrey 1137]
- [1755-] 1760 *Figures of the most beautiful, useful, and uncommon plants described in the Gardeners dictionary* (2 vols.) 300 plates. London. [Henrey 1097, TL 6059]
- [1756-] 1759 *The gardeners dictionary, ed. 7, revised and altered according to the latest system of botany* Illustrated. London. [Henrey 1111, TL 6044]. Issued in 112 parts between Oct 1756 and Mar 1759 [fide Henrey]
- 1757 *The gardeners kalendar, ed. 11* London. [Henrey 1138]
- 1760 *The gardeners kalendar, ed. 12* London. [Henrey 1139]
- 1762 *The gardeners kalendar, ed. 13* London. [Henrey 1140]
- 1763 *The abridgement of the gardeners dictionary, ed. 5* Quarto. London. [Henrey 1121, TL 6057]
- 1764 *The gardeners dictionary* Dublin (2 vols.) A pirated version of ed. 7 4to.
- 1765 *The gardeners kalendar, ed. 14* London. [Henrey 1141]
- 1766 *The gardeners kalendar, ed. 14* Dublin. [Henrey 1142]
- 1768 *The gardeners dictionary, ed. 8* London [Henrey 1113, TL 6043]
- 1768-1782 *Philip Millers Abbildungen der nützlichsten, schönsten und seltensten Pflanzen welche in seinem Gärtner-Lexicon vorkommen* (2 vols.) 300 plates. Nürnberg [TL 6060]
- 1769 *The gardeners kalendar, ed. 15* London. [Henrey 1143]
- 1771 *The abridgement of the gardeners dictionary, ed. 6* Quarto. London. [Henrey 1123, TL 6058]
- 1771 *Figures of the most beautiful, useful, and uncommon plants described in the Gardeners dictionary, ed. 2* (2 vols.) London. Differs from ed. 1 only in the title page, fide Stafleu (1967). [Henrey 1098, TL 6059]
- 1775 *The gardeners kalendar, ed. 16* London. [Henrey 1144]
- 1775 *Le grand dictionnaire des jardiniers et des cultivateurs, etc.* 8 vols. octavo. Paris. A French translation, updated, of ed. 8. [TL 6050]
- 1785 *Dictionnaire des jardiniers, etc.* 8 vols., quarto. Paris. French translation of ed. 8. [TL 6051]
- 1786-1789 *Dictionnaire des jardiniers, et des cultivateurs, nouv. édn.* Bruxelles. [TL 6052]. Based on ed. 8.
- 1789 *Supplément au dictionnaire des jardiniers*, Metz. By Laurent Marie de CHAZELLES. [TL 6061]
- 1792 *The gardeners kalendar, ed. 17* Dublin. [Henrey 1145]
- [1795-] 1807 *The gardeners and botanists dictionary...By the late Philip Miller...to which are now first added a complete enumeration and description of all plants hitherto known...* {ed. 9} By Thomas MARTYN (2 vols.). London [Henrey 1114, TL 6046]. Issued in parts.
- 1809 *Figures of the most beautiful, useful, and uncommon plants described in the Gardeners dictionary, ed. 3* (2 vols.). London. Edited by Thomas MARTYN, with new text. [Henrey 1099, TL 6059]
- 1834 *Miller's dictionary of gardening, botany & agriculture, Parts 1-3* London [Henrey 1115]. Intended to be completed in from 20-14 Parts, but publication ceased on p. 192 with the article on 'American cowslip'. Issued in wrappers with no t.p. [Needs checking for entries on e.g. *Adansonia*, *Aloe*, *Agave*].
- 1835[-1836] *The gardeners dictionary. The ninth edn. Being a copy of the latest edition of this work which has been published in the life-time of the author, and modified according to the latest discoveries in the science, etc.* 2 vols. oct. London. Second vol. ends abruptly with *Ebenus cretica*. Has t.p. to Vol.1 only. BM copy has 106 plates (3 coloured). [Henrey 1116]