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Typification and application of the name *Aloe perfoliata* L.

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Summary

Aloe perfoliata L. was a cornerstone of the treatment of Linnaeus's genus *Aloe*, including all the medical, spotted, and other stemmed aloes. In spite of this importance and priority has not previously been applied to any known species until the year 2000.

A full history of the name and its application is presented here.

Aloe perfoliata L. is confirmed as the type species of the genus *Aloe* L., and is considered to be the correct name for plants hitherto known as *Aloe microstigma* Salm-Dyck.

Aloe picta Thunb. is lectotypified here with the same type as *Aloe perfoliata* L. (p. 11), making it an obligate synonym.

No new names are proposed in this paper.

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Typification and application of the name *Aloe perfoliata* L.

Linnaeus (1753: 319-321) considered the perfoliate aloes of the genus *Aloe* to comprise a single species, *Aloe perfoliata*, with 16 varieties. Two of these were given varietal names, namely *A. perfoliata* var. *humilis* and *A. perfoliata* var. *vera*, while 14 others remained unnamed.

In his usual way, Linnaeus did not indicate which of the 16 varieties were to be considered typical, so it fell to later authors to make such a selection. The long history and lack of reliably identified specimens, together with illustrations of variable quality has been a problem for authors, and it was not until Glen & Hardy (2000: 100-101) made their selection that the name was returned to use. Under the rules of nomenclature, the name must of course be used for something, unless all of its 16 individual varieties, recognised today as species, are conserved over it, a wholly impractical solution. Also rejecting the name would have similar consequences for any species or variety that has the same type as *A. perfoliata* L. That would include *A. saponaria* (Aiton) Haw. (Art. 56.1), a name consistently misapplied to *A. maculata* All.

Historically, the earliest aloes to reach Europe were gathered towards the end of the 17thC. by a number of collectors, and as far as aloes are concerned perhaps the most important of these was Hendrik Bernard Oldenland, superintendent of the garden of the East India Company in Cape Town. He had botanical training and preserved some specimens, but he is important in the present context having supplied a number of *Aloe* species in the form of seeds to Jan and Caspar Commelijn at Leiden in the Netherlands. These were raised in the Leiden garden and illustrated

at various stages of maturity in their various illustrated catalogues of the garden. Linnaeus used these illustrations extensively in the protologue of *Aloe perfoliata* to characterise his varieties.

Oldenland accompanied Isaac Schrijver in an expedition of 4 Jan - 10 Apr 1689 (*Strelitzia* 26: 320). The route for this expedition is shown by Reynolds (1950: 31), and it penetrated the Western Cape to just beyond the present-day border with the Eastern Cape. Oldenland gave his gatherings phrase names, and these were adopted with little or no change by the Commelijns. Lists of names of plants collected by Oldenland were published by Valentyn in 1726 and by Burman in 1736.

Reynolds (1950: 87, 89) drew attention to a specimen in the herbarium of the Linnean Society of London, LINN 442.1, making the assumption that it was type material but without formally designating it as the lectotype of *Aloe perfoliata*. Other original material (illustrations) were cited in the Linnaean protologue, so a definite designation is required. Moreover, since most specimens in the Linnaean herbarium were preserved after the first period 1727-1753, without evidence of a date of preservation LINN 442.1 cannot be accepted as eligible original material. Indeed, it does not appear to be any of the elements accepted by Linnaeus as belonging to *A. perfoliata*. It is an inflorescence that most closely resembles that of *Aloe variegata*.

The German-born English botanist Dillenius was said to have been Linnaeus's favourite correspondent. Dillenius's great folio work on the plants of Sherrard's garden at Eltham was considered by Linnaeus to be a masterpiece of botany, so it is hardly surprising that

the Dillenius illustrations were used as the basis for three of the taxa belonging to his *Aloe perfoliata*. These three illustrations from *Hortus elthamensis* (1732), together with their currently accepted names are:

- 1: 17-18, t.14, fig.15. *Aloe maculata* All.
- 1: 18-19, t.15, fig.16. *Aloe perfoliata* L. [= *Aloe microstigma* Salm-Dyck]
- 1: 21-22, t.17, fig.19. *Aloe mitriformis* Mill.

The earliest type designation for *Aloe perfoliata* (Fig. 1) was made by Scopoli (1783: 127-128), citing Dillenius's plate 15 (Fig. 2-3). The second edition (1786: 137-138) also carries the same information. Although Scopoli listed only this species for the genus *Aloe*, that did not constitute a type designation for the genus because Scopoli was only listing species for which there was a known medical application. The Glen & Hardy (2000: 100-101) choice of plate 17 from the same Dillenius work is thus superfluous. The only reason given by Glen & Hardy for their choice was that it agreed with the specific epithet in having

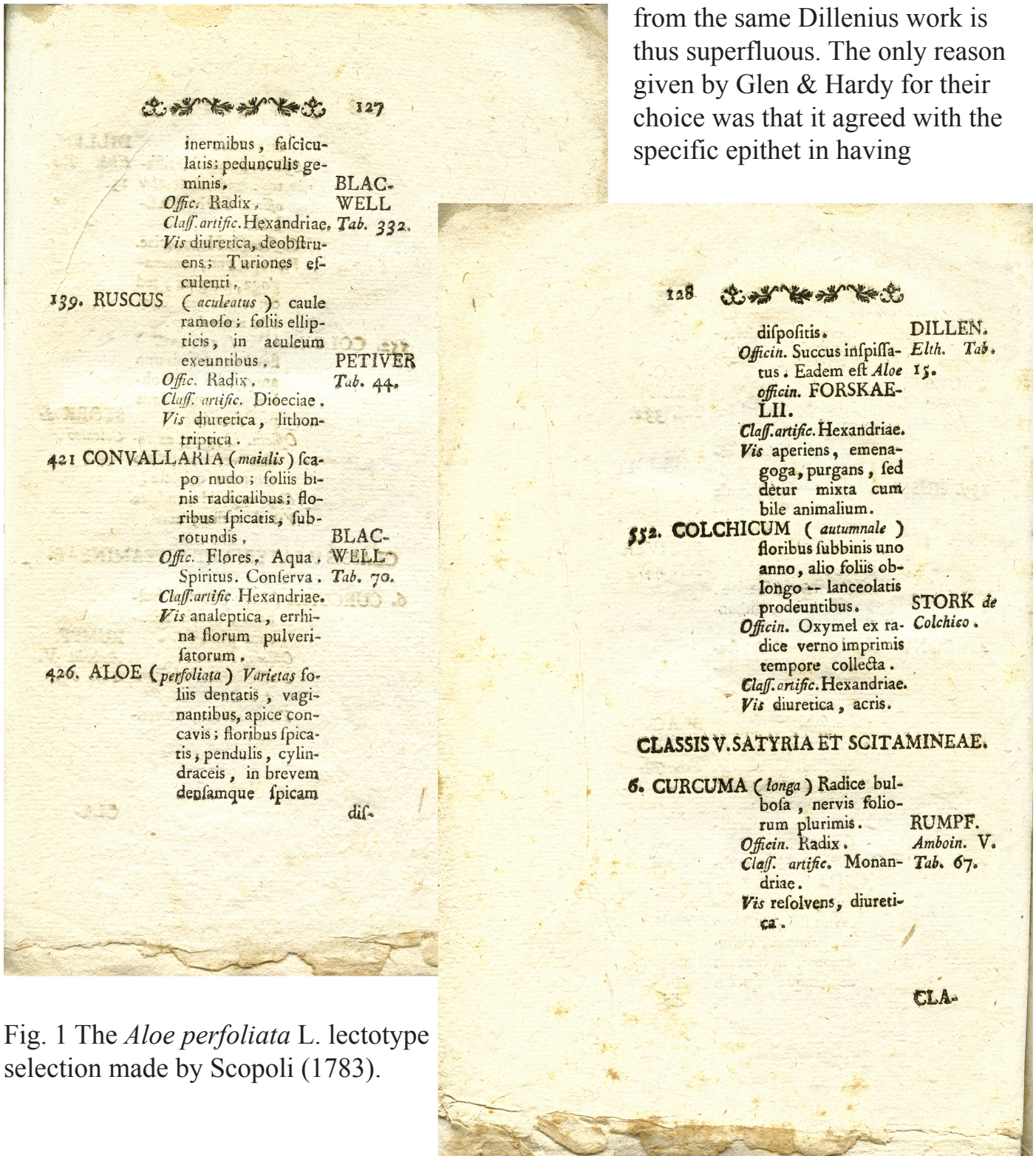


Fig. 1 The *Aloe perfoliata* L. lectotype selection made by Scopoli (1783).

prominently perfoliate leaves, but this is common to all aloes to varying degrees, especially to those known to Linnaeus.

The earliest type designation for the genus itself was that of Britton & Millspaugh (1920: 69), who chose *Aloe perfoliata* L. as stated by *Index nominum genericorum*.

There has been historical confusion between *Aloe perfoliata* L., known as the Great Soap Aloe to early 19thC botanists, and the other common spotted-leaved aloe, *Aloe maculata* All., called the Common Soap Aloe, although they are readily distinguished. In *A. maculata* the spotting tends to be larger and often in transverse bands, while the spots of

P. 15.

F. 16.

T. xv.

Fig. 2 (right) The lectotype of *Aloe perfoliata* L. from the standard edition of Dillenius, *Hortus elthamensis* 1: 18-19, t.15, fig.16, representing what has hitherto been called *Aloe microstigma* Salm-Dyck.

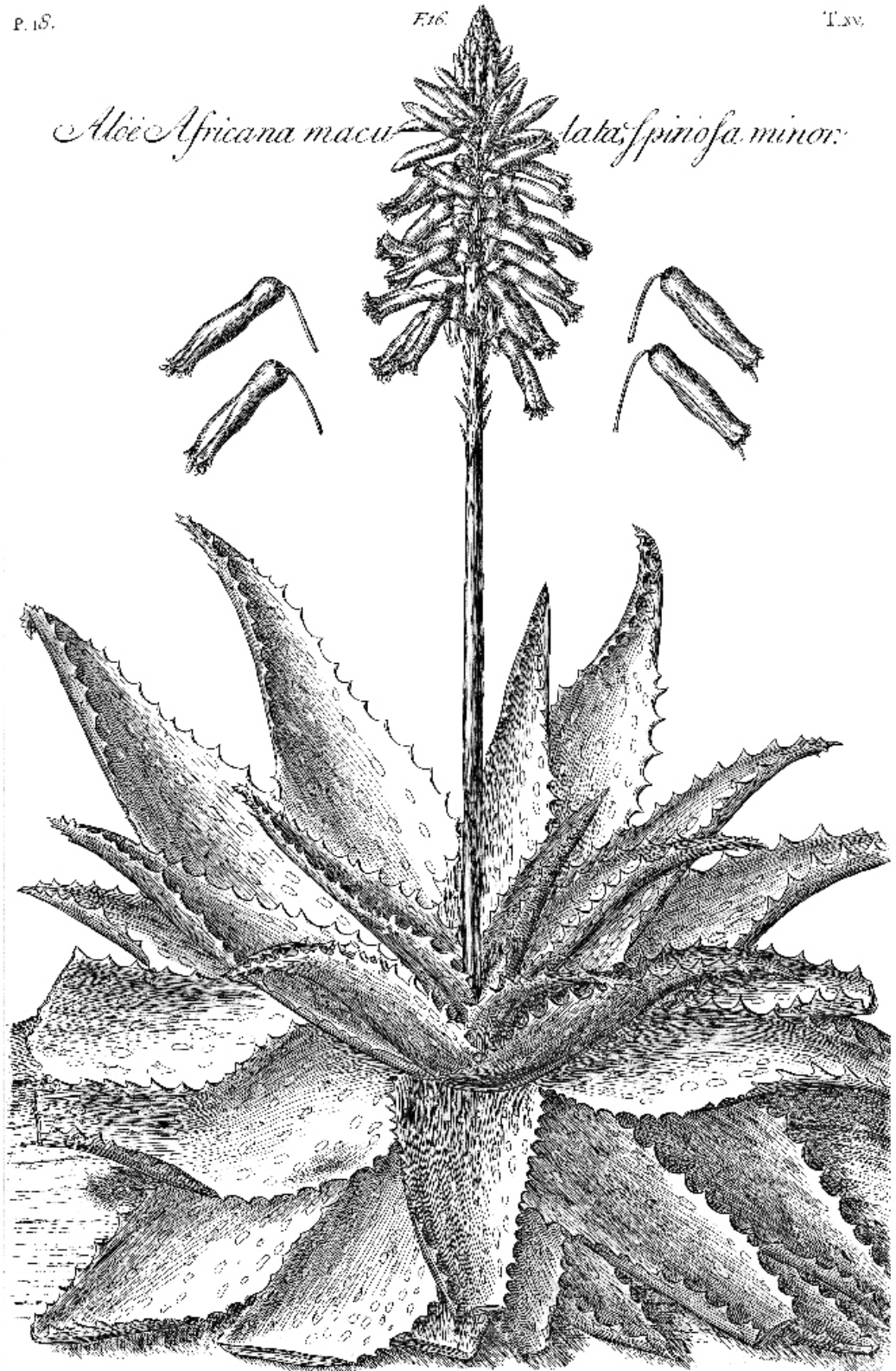


Fig. 3 (next page) One of the four known copies coloured by Dillenius himself, and reproduced here with the kind permission of the Museum of Natural History, London©.

P. 18.

F. 16.

T. xv.

Aloe Africana maculata, spinosa minor.





Fig. 4 A later illustration of *Aloe perfoliata*. This was Ker Gawler's concept of *Aloe picta*, from *Curtis's Botanical Magazine* 32: t.1323. 1810, based on a plant that had been supplied to Haworth from Sherard's Eltham garden. It agrees well with the type illustration of *A. perfoliata*.

A. perfoliata may be smaller and randomly scattered over both leaf surfaces. The inflorescences are very different, being a simple truncated corymb in *A. maculata* and an elongated conical raceme in *A. perfoliata*. The flowers of *A. perfoliata* are mainly bicoloured with red buds turning yellow or green at anthesis, but in some places the buds and open flowers may be uniformly red or yellow. The typical form has uniformly dark red flowers with greenish yellow tipped petals.

In *Aloe perfoliata* the leaves are generally spotted equally on both sides of the leaves. On the other hand, *Aloe maculata* is often described as “usually unspotted” on the lower side. However, they are equally spotted on both sides in Dillenius’s plate, and it seems to be relatively common for this to be the case.

Aloe perfoliata L., in the sense used here, is the same as, and the correct name for, *A. microstigma* Salm-Dyck (Fig. 5).

Description

Translated from the Latin, from Dillenius, J. J. (1732) *Aloe africana maculata spinosa minor* Dill., *Hortus elthamensis* 1: 18-19. The description consists mainly of the distinguishing characters from the species described in the previous plate, which depicted *Aloe maculata* All.

“This species is very similar to the last [*A. maculata*], inasmuch that they are not easily distinguished unless closely examined. However, it has less stem development, if any, certainly a shorter stem (I do not recollect it being more than a palm to a span of the fingers [3-9 inches, 8-24cm]) but no thicker, the leaves are certainly of equal length, but less thick & less strong, moderately broad at their base, narrower at the tip & with a long mucro, more concave, marked with fewer and less whitish spots, more on the lower

side towards a thorny tip, the other thorns on the other hand are never harmful.

It is further differentiated in the flowers & peduncle, such as not being so short & entirely green, but the flowers are markedly shorter, thicker & more spreading, pale red in colour but of a lively hue, elegantly spread out in a thyrse [cylindric, conical form] more tenuously attached by pedicels with a tongue-like scale at their base.

First opens its spritely flowers at one foot [in height], the spike fully developing to 2 feet, [peduncle] terete, compressed towards the base & never angular, of a glaucous pale green, the same colour as the leaves which are interspersed with white spots. The leaves are, however, disposed in a rosette, the smallest within, porrect at an oblique angle & remaining concave throughout, the middle [leaves] are more flattened & less porrect & more concave towards their extremity, the lowermost [leaves] lie in a horizontal plane, shortest in the middle, almost never concave towards the tip, below which is the bare stem (I have even sometimes observed it absent), like the previous species they are reflexing, although less so.

The outer floral segments are divided into three up to their middle at first, opening thereafter almost to the base, three inner segments are also at first divided continuously to the base, yet despite that they are fused to the back of the outer petals & create a monopetalous flower. Furthermore the three inner petals are sometimes broader than the outer & paler: both have green median lines towards

Fig. 5 (next page) The holotype illustration of *Aloe microstigma* Salm-Dyck, from Salm-Dyck, *Monographia generum aloes et mesembrianthemii*: Fasc.6: t.11 [§26, fig.4]. 1854.



A. microstigma.
(§.26.—Fig. 4.)

their extremities. There are six stamens arising from near the oblong ovary at the base of the flower, opening successively in threes, bearing oblong sticky apices [anthers], slightly exerted beyond the floral tube.

It flowers well, like the preceding species, primarily in the months of September & October with us.

Our figure is drawn to about half the scale of the actual plant, but the flowers depicted in the margin on either side are represented at natural size.

Aloë Africana caulescens, foliis spinosis, maculis ab utraque parte albicantibus obscurioribus, magis glaucis, quam praecedens *Boerh. Ind. Alt. Part II p.130. n.20.* is by chance the same as illustrated here, said to be an inhabitant of plains.”

Taxonomic summaries for *Aloe* L., *Aloe perfoliata* L. & *A. maculata* All.

Aloe L., *Species plantarum* 1: 319. (1 May) 1753; *Genera plantarum*, ed.5: 150. (Aug) 1754, but under the rules considered as simultaneously published with *Sp. Pl.* on 1 May 1753.

Name adopted from Tournefort (1700 2: t.171, cited erroneously by Linnaeus as t.170).

Tournefort's plate is mixed, mainly comprising the flowers and fruits of *Agave*, but there is one flower of *Aloe* in the strict sense. Tournefort's checklist of *Aloe* species has only two elements of *Aloe* s.s., namely those whose phrase names represent *Aloe vera* and *A. succotrina*.

T: Only the Tournefort plate was cited in the protologue, but that is mixed and its elements are unidentifiable.

LT: *Aloe perfoliata* L. Designated by Britton, N. L., & Millspaugh, C. F., *The Bahama flora*: 69. (26 Jun) 1920.

Homotypic infrageneric synonyms

Based on the same type as the genus *Aloe* L., the names listed below are all invalid (Art. 22.1), because they should bear the name of the genus unchanged in their appropriate rank. Salm-Dyck's names were inconsistently applied in that he circumscribed his names with different lists of included species in each of his revisions at various times.

Grandiflorae Haw. (pro sect. *Aloe* L.), New arrangement of the genus *Aloe*, *Trans. Linn. Soc. London* 7: 1, 14. 1804 nom. inval. (Art. 22.1). Includes the type of *Aloe* L. sect. *Aloe*. This was described on p.14, and given its rank on p.1.

Maculatae Haw. (pro unranked division of *Aloe* L.), *Synopsis plantarum succulentarum*: 81. 1812 nom. inval. (Art. 22.1). Includes the type of *Aloe* L.

Pictae Salm-Dyck (pro unranked division of *Aloe* L.), *Index plantarum succulentarum in horto dyckensi cultarum anno 1829*: 6. 1829 nom. nud.

Pictae Salm-Dyck (pro § 23 of *Aloe* L.) *Index plantarum succulentarum in horto dyckensi cultarum anno 1843*: 11. 1843 nom. nud.

Eualoe Baker (pro subgen. *Aloe* L.), A synopsis of *Aloineae* and *Yuccoideae*. *J. Linn. Soc.* 18(108): 153. (Oct 15). 1880 nom. inval. (Art. 21.3, 22.1). Epithet incorrectly formed and includes the type of *Aloe* L. subgen. *Aloe*.

Maculatae Baker (pro unranked group of *Aloe* L.), *Liliaceae VIII. Aloe*, Linn, in Thistleton-Dyer, W. T., *Flora capensis* 6(2): 303. 1896 nom. inval. (Art. 22.1). Includes the type of *Aloe* L.

Eualoe A.Berger (pro sect. *Aloe* L.), Über die systematische Gliederung der Gattung *Aloë*. In: Engler, A., *Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie* **36**: 46. 1905 nom. inval. (Art. 22.1). Epithet incorrectly formed and includes the type of *Aloe* L. subgen. *Aloe*.

Fruticosae A.Berger (pro subsect. *Aloe* L.), Über die systematische Gliederung der Gattung *Aloë*. In: Engler, A., *Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie* **36**: 47, 54-55, 65-66. 1905 nom. inval. (Art. 22.1). Includes the type of *Aloe* L. subsect. *Aloe*.

Magnae A.Berger (pro subsect. *Aloe* L.), *Liliaceae-Asphodelaceae-Aloineae*. In: Engler, A., *Das Pflanzenreich. Regni vegetabilis conspectus. Im Auftrage der Königl. preuss. Akademie der Wissenschaften* **4**(33): 161. (8 May) 1908 nom. inval. (Art. 22.1). Includes the type of *Aloe* L. subsect. *Aloe*.

perfoliata

Aloe africana; caulescens; foliis spinosis; maculis ab utrâque parte albicantibus, obscurioribus; magis glaucis quam praecedens Boerh., *Index alter plantarum quae in horto academico Lugduno-Batavo aluntur conscriptus ab Hermanno Boerhaave* **2**: 130, nr.20. 1720. *T*: Africa, on plains. Donated by D. Beaumont. [cited in the synonymy of the following by Dillenius 1732: 19]

Aloe africana maculata spinosa minor Dill., *Hortus elthamensis* **1**: 18-19, t.15, fig.16. 1732.

Aloe foliis caulinis dentatis amplexicaulibus vaginantibus L. var. η , *Hortus Cliffortianus*: 131. 1737.

Aloe foliis caulinis dentatis amplexicaulibus vaginantibus L. var. γ , *Hortus Upsaliensis*: 86. 1748.

Aloe perfoliata L. [var. μ], *Species plantarum* **1**: 319-320. (1 May) 1753.

T: Africa, rocky places on plains.

LT (design. Scopoli 1783: 128): *Aloe africana maculata spinosa minor* Dillenius, *Hortus elthamensis* **1**: t.15, fig.16. 1732.

Homotypic synonyms:

Aloe perfoliata var. *saponaria* Aiton, *Hortus Kewensis* **1**: 467. 1789.

Aloe picta Thunb., *Dissertatio botanico-medica de Aloë, Gradu Doctoris Publico Examini Subjicit Andreas Hesselius, Diss. Acad. Upsaliae* **2**: 6. (Jun) 1785. *T*: None. There are no specimens of *Aloe picta* in the Thunberg herbarium. The taxon was mixed, based on *A. perfoliata* var. θ , λ , μ , & ν , i.e. all the spotted aloes. The type of *A. perfoliata* Thunb. non L. was explicitly excluded and that name misapplied to *A. succotrina* All. and its allies. The actual type of *A. perfoliata* L. itself was, however, explicitly included, making *A. picta* Thunb. a synonym. *LT* (design. here): Dillenius, *Hortus elthamensis* **1**: t.15, fig.16. 1732.

Aloe picta var. *minor* Willd., *Caroli a Linné Species Plantarum*, ed.5 **2**(1): 187. 1799.

Aloe saponaria (Aiton) Haw., New arrangement of the genus *Aloe*, *Trans. Linn. Soc. London* **7**: 17. 1804.

Heterotypic synonyms:

Aloe microstigma Salm-Dyck, *Monographia generum aloes et mesembrianthemii*:

Fasc.6: t.11 [§26, fig.4]. 1854 (Jun). *T*: icon in loc. cit. (Fig. 5)

Aloe obscura Mill., *Gardeners Dictionary* ed.8: *Aloe* nr.6. 1768. *T*: None.

Aloe umbellata DC., *Plantarum historia succulentarum* 1: t.98. 1802. T: icon in loc. cit.

maculata

Aloe africana caulescens, foliis spinosis maculis ab utraque parte albicantibus notatis J.Commelijn, *Horti medici Amstelodamensis rariorum tam orientalis quam occidentalis Indiae aliarumque peregrinarum plantarum* 2: 9, t.5. 1701.

Aloe africana, caulescens, foliis caulem amplectentibus, floribus aurentiacis. Dom. Gul Sherard, in Bradley, *Historia plantarum succulentarum* Dec.4: 11, t.33. 1727.

Aloe africana maculata spinosa major Dillenius, *Hortus elthamensis* 1: 17-18, t.14, fig.15. 1732. (Fig. 6)

Aloe perfoliata L. var. λ , *Species plantarum* 1: 319-320. (1 May) 1753.

Aloe maculata All., *Auctarium ad synopsis methodicam stirpium horti regii Taurinensis*: 13. 1773.

T: Africa.

LT(design. Guglielmone & al 2009: 178): *Aloe africana* caulescens, foliis spinosis maculis ab utraque parte albicantibus notatis J.Commelijn, *Horti medici Amstelodamensis rariorum tam orientalis quam occidentalis Indiae aliarumque peregrinarum plantarum* 2: 9, t.5. 1701. South Africa, W Cape; Jan-Apr 1689, Hendrik Bernard OLDENLAND 3 [*Maria Moninckx Atlas* 3: t.6 (1698-1704)] [cited in synonymy by Linnaeus (1748: 86) as *A. perfoliata* var. γ , but later segregated as *A. perfoliata* var. θ (1753: 320).

ET(design. Guglielmone & al 2009: 178): South Africa, Kwazulu-Natal, Pietermaritzburg, alongside the road between Bishopstowe & Hayfields, 18 Aug 2007, CROUCH II38 (NH).

Homotypic synonym:

Aloe maculosa Lam., *Encyclopédie méthodique: botanique* 1: 87. 1783.

Heterotypic synonym:

Aloe picta var. *major* Willd., *Caroli a Linné Species Plantarum*, ed.5 2(1): 186-187. 1799. T: None.

Acknowledgements

An experienced opinion from John Lavranos on the identity of Figs. 2-4 is duly acknowledged with gratitude.

The Library of the Natural History Museum, London is thanked for their kind permission to reproduce Figs. 3 & 6 in this document.

Fig. 6 (next page) *Aloe maculata* All. from Dillenius, *Hortus elthamensis* 1: 17-18, t.14, fig.15. The version coloured by Dillenius himself, and reproduced here with the kind permission of the Natural History Museum, London ©.

P.17.

Alœe Africana maculata.

F.15.

T. XIV.

Spinosa major.



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Fig. 7 The seedlings of *Aloe perfoliata* are attractively marked and therefore grown in large numbers for the European garden centre trade and elsewhere. This example is 22cm. high. There are numerous other modern photos of this species available on the Web, generally under the name *Aloe microstigma*. Photo: Roy Mottram

