

Allioni's *Aloe* names (Asphodelaceae): nomenclature and typification

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ABSTRACT

The taxa belonging to the genus *Aloe* published in *Synopsis methodica stirpium horti regii taurinensis* (Allioni 1760) and in *Auctarium ad synopsis methodicam stirpium horti regii taurinensis* (Allioni 1773) were examined. The protologues of *Aloe maculata* All. and *A. verrucosospinosa* All. are analysed and lectotypes designated. The homonymy of *A. succotrina* All. with *A. succotrina* Weston (1770) is recognized, and the lectotype of this last name designated. Epitypes are selected to fix the application of all three names. Short differential diagnoses of the three species are given and their distribution ranges discussed; distribution maps based on specimens held in the South African National Herbarium (PRE), KwaZulu-Natal Herbarium (NH), Compton Herbarium (NBG) and the South African Museum Collection (SAM) held in NBG are provided.

INTRODUCTION

Synopsis methodica stirpium horti regii taurinensis, published by Carlo Allioni (1728–1804) probably in 1760 (see Stafleu & Cowan 1976), is the first printed catalogue of the plants cultivated in the Botanic Garden of the University of Turin. The names of the species listed in this publication followed the binomial nomenclature system. For 88 of these, Allioni did not find a previously published binomial in the contemporary literature. Instead he gave them a number corresponding to a note. In this note he cited an earlier polynomial, when present, with the corresponding bibliographic citation, or he provided an original description in the absence of citations or as a complement to indications of previous authors. These nomenclatural gaps were later filled by Allioni in *Auctarium ad synopsis methodica stirpium horti regii taurinensis* (1773, following Stafleu & Cowan 1976). In *Auctarium*, Allioni provided new binomials for 77 of the previously cited polynomials. Of these, 47 were based on descriptions provided by other authors (Dandy 1970).

Types of the taxa he described were checked among the ± 11 000 specimens of his herbarium (TO) (Dal Vesco 1986, 1992a, 1992b; Dal Vesco *et al.* 1988; Moraldo & Forneris 1988; Bechi & Forneris 1998; Selvi & Bigazzi 1998), containing also *exsiccata* prepared from plants in cultivation at the Botanical Garden of Turin.

In this paper, two binomials, *Aloe maculata* All. and *A. verrucosospinosa* All., published by Allioni in *Auctarium* for representatives of the Old World genus *Aloe*

(Asphodelaceae), are analysed and typified. Allioni also described *A. succotrina*, but this epithet was previously used, for the same taxon, by Weston (1770), thus Allioni's name is a homonym. Weston's name is here typified.

Each species is attributed to its correct taxonomic group and the nomenclature is updated. Diagnostic morphological characters are based on the current taxonomic circumscription of the species and geographical distribution maps are provided for each of the three species. These maps are based on specimens held in the South African National Herbarium (PRE), KwaZulu-Natal Herbarium (NH), Compton Herbarium (NBG) and the South African Museum Collection (SAM) held in NBG. All relevant literature was consulted and Allioni's herbarium examined. In addition, other collections preserved at TO (Bellardi's herbarium and TO-HG) that are taxonomically correlated to the species cited in these two catalogues were checked.

RESULTS AND DISCUSSION

A list of the species referred to the genus *Aloe* by Allioni is presented in Table 1. It includes the binomials published in *Synopsis* or in *Auctarium*, or, when no binomial was used by Allioni, his polynomials as cited in the notes in his books are given; information on the specimens in Allioni's herbarium is also presented. In *Synopsis*, 13 species are recorded. For four of these (*Aloe disticha* L., *A. spiralis* L., *A. retusa* L., *A. variegata* L.) Allioni used the Linnean binomial, whereas for the remaining nine he listed in a note the corresponding polynomials assigned by Dillen (1732), J. Commelijn (1697) and C. Commelijn (1701, 1703). Of these nine, three were not included in *Auctarium*: for *A. margaritifera* L., the Linnean binomial is applied; for *A. carinata* All. and *A. glauca* All., the binomials proposed had already been used previously by Miller (1768) (see Chiovenda 1912) and are illegitimate homonyms. A further binomial, *A. succotrina* All., still currently widely used (see for example Newton 2001a, b), is predated by *A. succotrina* Weston (1770), and is therefore an illegitimate homonym. Finally, *A. maculata* All. and *A. verrucosospinosa* [sic] All. are valid binomials.

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In Allioni's herbarium, specimens of two *Aloe* species were found which can be assigned respectively to *Aloe maculata* and to another species, only reported with the polynomial *Aloe africana flore rubro* ... in Allioni (1760), which could not be positively identified (see Table 1). No other specimens were found in Bellardi's herbarium and in TO-HG.

***Aloe maculata* All.**, *Auctarium ad synopsis methodica stirpium horti regii taurinensis* 5: 65 (1773). *Locus classicus: Semina hujus plantae [] mittuntur ex Africa.* Lectotype, here designated: C. Commelijn, *Horti medici Amstelodamensis rariorum* 2: fig. 5 (1701) (Figure 1). Epitype, here designated: Pietermaritzburg, alongside the road between Bishopstowe and Hayfields, 29°37'13.05" S; 30°26'46.13"E, 18 August 2007, *Crouch 1138* (NH).

Taxonomic and nomenclatural notes: Allioni (1773) makes reference to a plate published in *Hortis medici Amstelaedamensis* (C. Commelijn 1701: vol. 2, fig. 5), that referred to an *Aloe* described as *Aloe Africana cau-*

lescens foliis spinosis maculis ab utraque parte albicantibus notatis. In Allioni's herbarium there is a specimen labelled *Aloe afric. coerulescens [sic] fol. spin. macul. ab utraq. parte albicantib. notatis*. This is a candidate for a lectotype, however, it is not dated, thus it cannot be ascertained if it can be considered as original material in the sense of the ICBN (McNeill *et al.* 2006); there is also the difference in the wording, with *coerulescens* replacing *caulescens*, but this is probably simply a spelling error. Allioni's reference to the plate of excellent quality in C. Commelijn (1701) makes it preferable to designate this plate as the lectotype of *A. maculata*. Several authors (Dandy 1970; Webb 1980; Glen & Smith 1995; Newton 2001a, b; Smith & Van Wyk [B-E.] 1996; Smith & Van Wyk [A.E.] 2008) considered the use of Allioni's binomial as correct since it has priority over the other binomials. This view was not supported by the proposal made by Gilbert & Demissew (1997) to conserve the binomial *A. saponaria* (Aiton) Haw. (sub *A. saponaria* Haw.), which they suggested would maintain nomencla-

TABLE 1.—Species of *Aloe* included by Allioni in *Synopsis* (1760) and in *Auctarium* (1773) and Allioni's corresponding herbarium specimens

| <i>Synopsis methodica stirpium</i> (1760) | | <i>Auctarium ad synopsis</i> (1773) | | | Allioni's herbarium |
|---|--|-------------------------------------|-----------------------------------|---|--|
| Binomial | Polynomial (footnote) | footnote/p. | Binomial | Polynomial (footnote) | footnote/p. |
| <i>Aloe disticha</i> (L.) | | - (p. 56) | | | |
| <i>Aloe spiralis</i> (L.) | | - (p. 56) | | | |
| <i>Aloe retusa</i> (L.) | | - (p. 56) | | | |
| <i>Aloe variegata</i> (L.) | | - (p. 56) | | | |
| | <i>Aloe africana sessilis foliis carinatis verrucosis</i> Dill. <i>elth.</i> , p. 22 | 31 (p. 56) | <i>Aloe carinata</i> | <i>Aloe Africana sessilis foliis carinatis verrucosis</i> Dill. <i>elth.</i> , p. 10 | 46 (p. 65) |
| | <i>Aloe africana humilis spinis inermibus et verrucosis obsita</i> Comm. <i>prael.</i> , p. 77 | 32 (p. 56) | <i>Aloe verucosospinosa [sic]</i> | <i>Aloe Africana humilis, spinis inermibus & verrucosis obsita</i> Comm. <i>prael.</i> , p. 77 | 47 (p. 65) |
| | <i>Aloe africana flore rubro folio maculis ab utraque parte albicantibus notato</i> Comm. <i>hort. II</i> , p. 15 | 33 (p. 56) | | | <i>Aloe fl. rubro fol. macul. ab utraq. parte albicantibus notato</i> |
| | <i>Aloe africana folio in summitate triangulari margaritifera flore subviridi</i> Comm. <i>hort. II</i> , p. 10 | 34 (p. 57) | <i>Aloe margaritifera</i> L. | <i>Aloe africana folio in summitate triangulari margaritifera flora [sic] subviridi</i> Comm. <i>hort. II</i> , p. 10* | 51 (p. 65) |
| | <i>Aloe africana foliis glaucis margine, et dorsi parte superiore spinosis, flor. rubro.</i> Comm. <i>prael.</i> , p. 75 | 35 (p. 57) | <i>Aloe glauca</i> | <i>Aloe Africana foliis glaucis margine, & dorsi parte superiore spinosis fl. rubro</i> Comm. <i>prael.</i> , p. 75 | 50 (p. 65) |
| | <i>Aloe africana caulescens foliis spinosis maculis ab utraque parte albicantibus notatis</i> Comm. <i>hort. II</i> , p. 9 | 36 (p. 57) | <i>Aloe maculata</i> | <i>Aloe Africana caulescens [sic] foliis spinosis, maculis ab utraque parte albicantibus notatis</i> Comm. <i>hort. II</i> , p. 9 | 49 (p. 65) <i>Aloe afric. coerulescens [sic] fol. spin. macul. ab utraq. parte albicantib: notatis</i> |
| | <i>Aloe africana caulescens foliis glaucis brevissimis, foliorum summitate interna & externa nonnihil spinosa.</i> Comm. <i>prael.</i> , p. 73 | 37 (p. 57) | | | |
| | <i>Aloe succotrina angustifolia spinosa flore purpureo.</i> Comm. <i>hort. I</i> , p. 91 | 38 (p. 57) | <i>Aloe succotrina</i> | <i>Aloe Succotrina angustifolia fl. purpureo.</i> Comm. <i>hort. I</i> , p. 91 | 48 (p. 65) |
| | <i>Aloe foliorum margine luteo.</i> | 39 (p. 57) | | | |

*, *Aloe pumila* L. var. *a margaritifera* L. (*Species plantarum* 1753: 322).

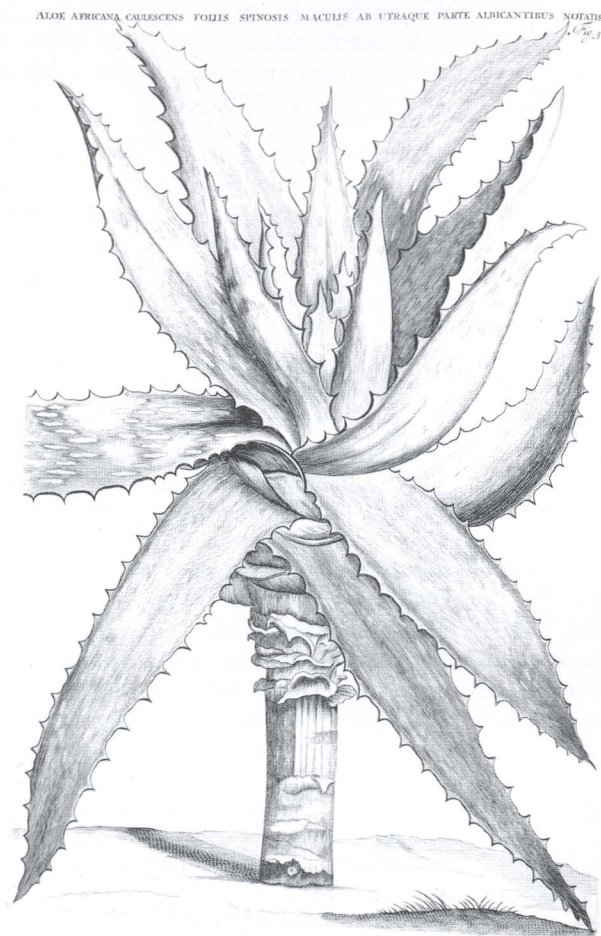


FIGURE 1.—*Aloe africana caulescens foliis spinosis maculis ab utraque parte albicantibus notatis* (= lectotype of *Aloe maculata* All.). In C. Commelijn, *Horti medici Amstelodamensis. Pars altera*. Blaeu, Amstelodami, 1701, fig. 5.

tural stability, as this binomial is better known than Allioni's. Nevertheless, *A. saponaria* has not been conserved (McNeill *et al.* 2006: art. 14). Chiovenda (1912) gave *A. obscura* Mill. (1768) as the accepted name considering *A. maculata* to be a synonym. This view has not been followed by any other authors and the correct application of the epithet *obscura* remains doubtful (Stungo 1996). At present, the binomial *A. obscura* is considered to be of unresolved application, and it may refer either to a variant of *A. maculata* (and then becoming the accepted name, taking precedence over *A. maculata*) or to a hybrid, with *A. maculata* as one of the parents. However, no plants are known in South Africa that can be matched to this species or to Miller's description, and no specimen, nor natural population, has been found which could allow us to make a comparison (L. Newton pers. comm.).

The collections of *Aloe maculata* that were available to C. Commelijn are attributed to H.B. Oldenland (\pm 1663–early 1697). *A. maculata* was cultivated in the Dutch East India Company's Garden at the Cape in 1695, when Oldenland was Superintendent and a species with the name *Aloe Africana caulescens foliis spinosis maculis ab utraque parte albicantibus notatis* was listed in his herbarium. Oldenland's name was later used by C. Commelijn in the plate that first depicted this species. It is not known where Oldenland collected the first specimens of *A. maculata* as the species is widely distributed, from the

Cape Peninsula to Swaziland (Reynolds 1950; Van Wyk & Smith 2003), but more than likely it would have been in or near Cape Town since this is a known locality for the species.

The plate that depicts the plant, here designated as lectotype, had already been referred to in the literature as the iconotype of this species (Glen & Hardy 2000). However, the term iconotype has no status in the typification process as formalized in the ICBN (McNeill *et al.* 2006). The plant depicted in the plate lacks an inflorescence and consequently it lacks some of the critical characters needed to easily distinguish it from other spotted-leaved aloes. For this reason, an epitype is designated here.

Diagnostic morphological characters: maculate (spotted) aloe with flat-topped, capitate (head-shaped) racemes of about 0.6 m tall and uniformly coloured flowers.

Geographical distribution: *Aloe maculata* has one of the widest known distribution ranges of all the aloes. It occurs commonly from the Cape Peninsula along the climatically moderate southern African coastal belt below the Great Escarpment to as far north and northeast as KwaZulu-Natal, Mpumalanga, Limpopo and Swaziland, but apparently does not enter neighbouring Mozambique. It also occurs in the southern African interior in Lesotho and in South Africa's Free State Province, both of which have a harsh, continental climate (Figure 2).

Aloe succotrina All., *Auctarium ad synopsis methodica stirpium horti regii taurinensis* 5: 65 (1773). *Locus classicus:* *Sobolem hujus plantae, ex India orientali in Hollandiam transmissae* ... [\equiv *A. succotrina* Weston, *Botanicus universalis et hortulanus* ... *Tabulis aeneis illustratis tomis quatuor* ... Londini (prostant venales apud J. Bell), vol. I, 5 (1770). Lectotype: J. Commelijn, *Horti medici Amstelaedamensis*, 1: fig. 48 (1697) (Wijnands 1983: 126) (Figure 3). Epitype, here designated: boulder field near Window Gorge, above Newlands, 500 m alt., July 1905, *Marloth 3967* (PRE)].

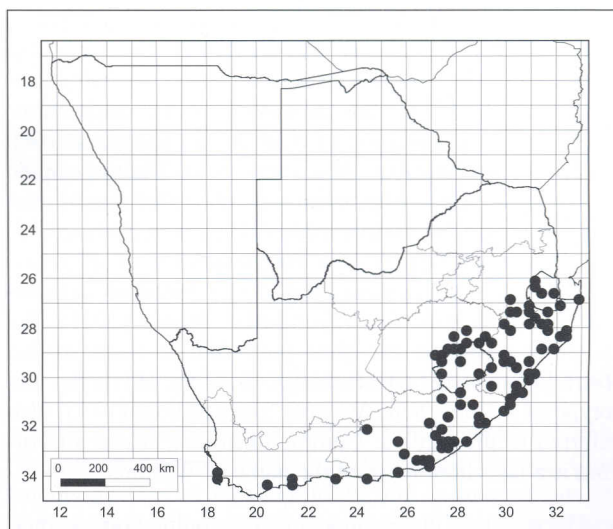


FIGURE 2.—Geographical distribution of *Aloe maculata* All. based on specimens held in the National Herbarium (PRE), KwaZulu-Natal Herbarium (NH), Compton Herbarium (NBG) and the South African Museum Collection (SAM) held in NBG.

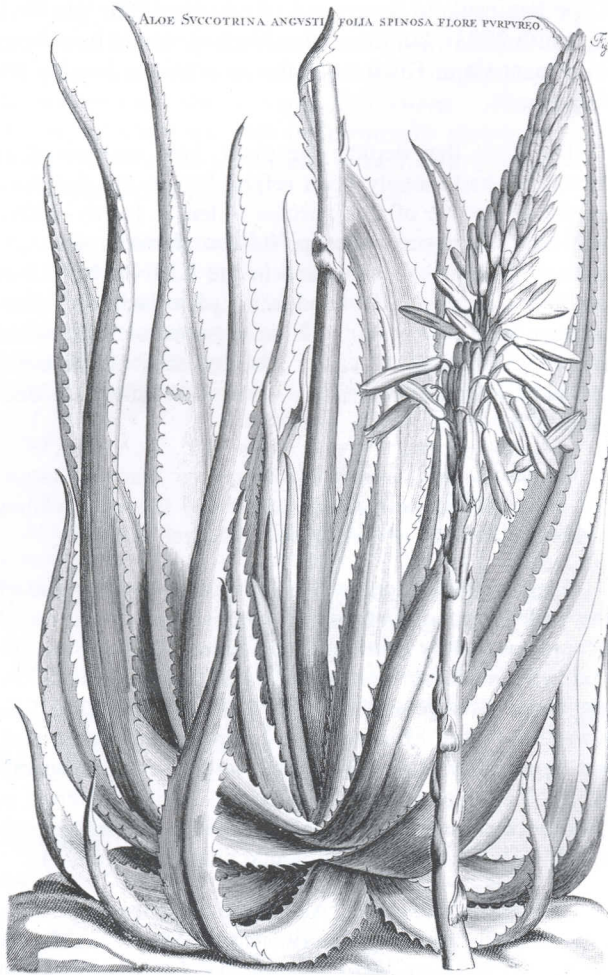


FIGURE 3.—*Aloe succotrina angustifolia spinosa flore purpureo* (= lectotype of *Aloe succotrina* Weston). In J. Commelijn, *Horti medici Amstelodamensis*. Pars prima. Blaeu, Amstelodami, 1697, fig. 48.

Taxonomic and nomenclatural notes: the name *Aloe succotrina* is still commonly attributed to Lamarck in the International Plant Name Index (IPNI) 2008; TROPICOS 2008; African Plant Checklist and Database (APCD) 2008; or to Allioni (Dandy 1970), but the first valid publication of the name was by Weston (1770). Apart from the short description, Weston gave no other indication (distribution, materials, etc.) for his *succotrina*, but in the introduction to his publication he referred to Linnaeus (1764). For the description of *Aloe succotrina*, Weston copied Linnaeus *verbatim* [the name was not validly published by Linnaeus, who simply copied J. Commelijn's (1697) polynomial, sinking it into the synonymy of *A. perfoliata*]. That *A. succotrina* Weston was based on J. Commelijn's plate was also reported by Brown (1911). We therefore designate the plate published in *Horti medici Amstelodamensis* (J. Commelijn 1697: fig 48) as the lectotype of *A. succotrina* Weston. Since Allioni (1773) also referred to the same J. Commelijn figure, his *A. succotrina* is a later homonym of the name of Weston.

The origin of the name and its misapplication to other, non-South African species, has been discussed in the literature (see Reynolds 1950). *Aloe succotrina* does not occur on the island of Socotra and it is suggested that the epithet derives from 'succocitrina', referring to the yel-

low colour of the sap crystals when pounded (Reynolds 1950), although the purple colour of the dried leaves is one of the distinctive characters of the species (Glen & Hardy 2000; Van Wyk & Smith 2003).

Given that the purple colour of the dry leaves of *Aloe succotrina* is an important diagnostic character for the species, it could be argued that the illustration (plate) alone is insufficient to allow for the positive identification of the species. It is thought that *A. succotrina* may have been collected for the first time near Kloof Nek (Reynolds 1950; Smith & Van Wyk 1996). Brown (1911: 142) states that 'Although *Aloe succotrina* is not mentioned by Thunberg in his *Prodromus* or *Flora*, yet in his *Travels*, English translation, edn 3, vol 1: 213, he mentions, under the date of 14th December 1772, when at a farm near Slange River, in the Oudtshoorn Division, that "Here we saw quickset hedges of *Aloe succotrina*"'. This locality is quite remote from Kloof Nek, which is in Cape Town. According to Brown (1911), Thunberg probably referred to *A. fruticosa*, which is now regarded as a synonym of *Aloe arborescens* Mill. Even though *A. succotrina* had therefore been known for more than 200 years, this species was only accurately recorded for the first time in the wild in 1906 by Rudolf Marloth. It was then stated to occur in a field of boulders above Newlands, presumably in or near what is today the Kirstenbosch National Botanical Garden, and also near Hout Bay along the coast near Cape Town. A voucher specimen for the occurrence of the species at the former locality (Marloth 3967) is therefore here designated as the epitype.

Diagnostic characters: shrubby aloe with tall, erect, unbranched inflorescences and greyish green leaves that, once dry, are persistent and purple, and with white, deltoid teeth on the margins.

Geographical distribution: the species is restricted to the southwestern Cape of South Africa. It typically occurs in fynbos vegetation on and against sandstone rocks and cliffs from the Cape Peninsula eastwards to Hermanus (Figure 4).

Aloe verrucosospinosa All.: 65 (1773). Lectotype, here designated: C. Commelijn, *Praeludia botanica*: fig. 26 (1703) (Figure 5) [= *A. humilis* (L.) Mill., The abridgement of the Gardener's dictionary: no. 10 (1771)]. Lectotype: C. Commelijn, *Horti medici Amstelodamensis plantae rariores et exoticae ad vivum aeri incisae*: fig. 46 (1706) (Wjinands 1983: 124) (Figure 6). Epitype, here designated: Mossel Bay, C.P., 28 July 1915, *Pole Evans 194* (PRE)].

Taxonomic and nomenclatural notes: the original spelling was *Aloe verucosospinosa*. Following article 60.1 of the ICBN (McNeill *et al.* 2006) the orthographically correct name is *A. verrucosospinosa*. No original material of this species was found in Allioni's herbarium.

Wjinands (1983: 124) used plate 46 in C. Commelijn (1706) as the lectotype of *Aloe humilis* and *A. verrucosospinosa*. However, Allioni referred to page 77 in C. Commelijn (1703) to which plate 26 is attached; although plate 46 (C. Commelijn 1706) apparently refers to the same plant, it is not simply a reproduction, since it differs in several details and includes an inflorescence which is

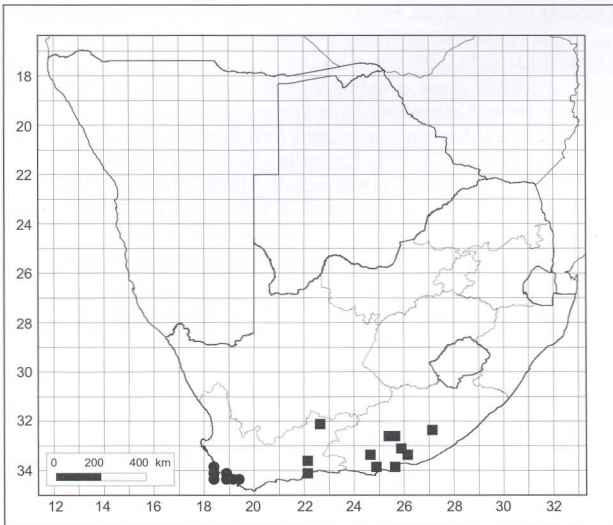


FIGURE 4.—Geographical distribution of *Aloe succotrina* Weston, ●; and *A. verrucosospinosa* All. (= *Aloe humilis* Mill.), ■, based on specimens held in the National Herbarium (PRE), KwaZulu-Natal Herbarium (NH), Compton Herbarium (NBG) and the South African Museum Collection (SAM) held in NBG.

missing from plate 26. Thus, plate 46 in C. Commelijn (1706) cannot be considered as original material of *A. verrucosospinosa* in the sense of Art. 9.2 of the ICBN and consequently it cannot be used as its lectotype. We designate here, as lectotype of *Aloe verrucosospinosa* All., plate 26 in *Praeludia botanica* (C. Commelijn 1703).

Although the vegetative characters shown in the plate 26 are consistent with the concept of *A. humilis*, and the same specimen was apparently later depicted with an inflorescence, it may be confused with other species which occur in, or approximate to, its distribution area, especially since two look-alike miniatures (*A. aristata* Haw. and *A. brevifolia* Mill.) also have leaf tubercles and marginal teeth. For this reason, an epitype is designated here. It is possible that the first collections of *Aloe humilis* were made near Oudtshoorn, the westernmost locality of the species on the route taken by Oldenland (Reynolds 1950). A collection made by Pole Evans in 1915 under the number 194 (PRE), at Mossel Bay, a locality ± 80 km from Oudtshoorn which is the westernmost occurrence of the species along the coast, is here designated as epitype. It was cited by Reynolds (1950) under *A. humilis*.

As was the case with *Aloe maculata*, the material of '*Aloe Afric. humilis spin. et verrucis obsita*' that was available to Commelijn, and was later used for the descriptions of *A. humilis* and *A. verrucosospinosa*, is attributable to Oldenland. Oldenland accompanied the Schrijver expedition towards the eastern interior of the Eastern Cape in 1689. The expedition reached the vicinities of Oudtshoorn and Uniondale, travelling into the arid interior as far east as 30 km northwest of Aberdeen. *Aloe humilis* was one of the species that was planted in the Dutch East India Company's Garden at the Cape, and was growing there in 1695 when Oldenland was Superintendent. The name '*Aloe Africana humilis spinis inermibus et verrucis obsita*' was already given by Oldenland and later used by Commelijn (Reynolds 1950).

ALOE AFRIC. HUMILIS SPIN. ET VERRUCIS OBSITA Fig. 26

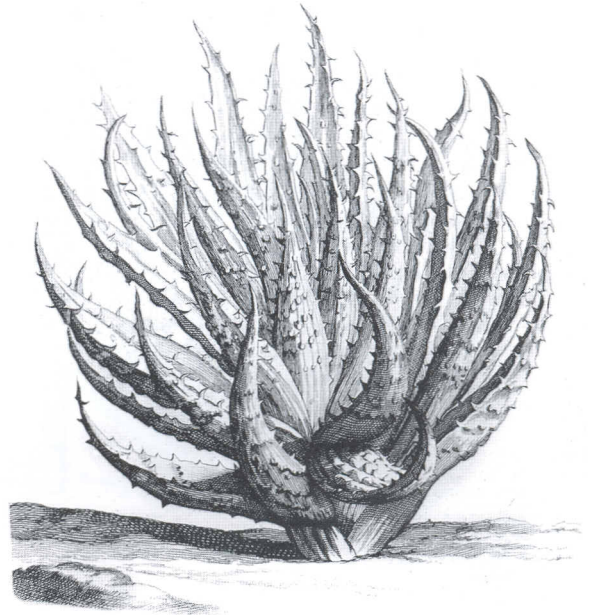


FIGURE 5.—*Aloe Afric. humilis spin. et verrucis obsita* (= lectotype of *Aloe verrucosospinosa* All.). In C. Commelijn, *Praeludia Botanica*. Haringh, Leiden, 1703, fig. 26.

Allioni's binomial is not cited by Newton (2001a, b) nor is it listed in TROPICOS 2008, the IPNI 2008 or World Checklist of Selected Plant Families (WCSP) 2008. However, Dandy (1970), Wijnands (1983: 124), APCD 2008 and Plants of southern Africa (POSA) 2008 cited *A. verrucosospinosa* [sic] as a later synonym of *A. humilis* (L.) Mill., an interpretation with which we agree.

Diagnostic characters: miniature aloe with leaves carrying soft, harmless tubercles and teeth, and short, stout inflorescences with large, loosely packed, pencil-shaped flowers.

Geographical distribution: the species has a wide distribution range in the southern and eastern Cape of South Africa, where it occurs in the arid interior in sparse shrublands in the Little and Great Karoo, as well as on coastal hills in renosterveld or in dry, subtropical thicket, from Mossel Bay in the west to Grahamstown in the east (Figure 4).

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ALOE AFRIC. HUMILIS SPIN. ET VERRUCIS OBSITA. Fig. 46

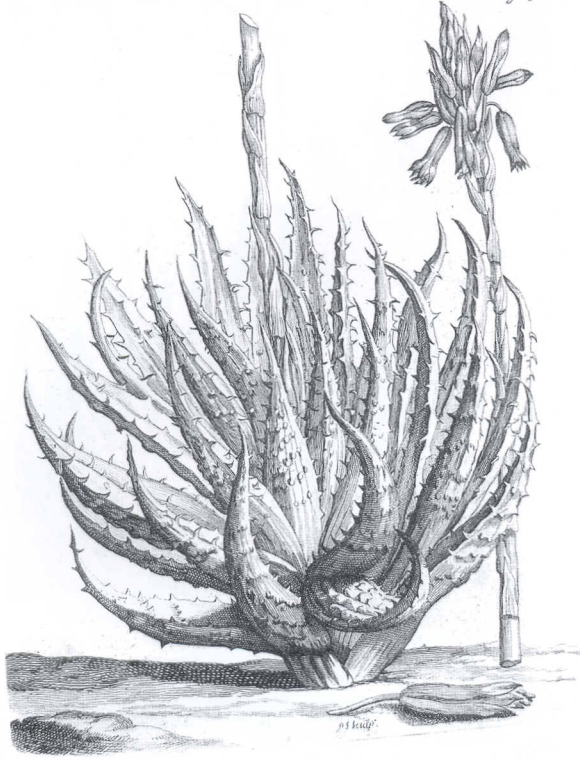


FIGURE 6.—*Aloe Afric. humilis spin. et verrucis obsita* [= lectotype of *Aloe humilis* (L.) Mill.]. In C. Commelijn, *Horti medici Amstelaeadamensis plantae rariores et exoticae*. Haringh, Leiden, 1706, fig. 46.

houses the South African Museum Collection (SAM), and the KwaZulu-Natal Herbarium (NH) are thanked for providing information on the distribution ranges of *Aloe humilis*, *A. maculata* and *A. succotrina*.

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