

## A further species of *Agave* L., *A. salmiana* Otto ex Salm-Dyck (subsp. *salmiana*) var. *salmiana* (Agavaceae), naturalised in the Eastern Cape Province of South Africa

Gideon F. Smith<sup>1</sup> and Estrela Figueiredo<sup>2</sup>

<sup>1</sup> Office of the Chief Director: Biosystematics Research and Biodiversity Collections, South African National Biodiversity Institute, Private Bag X101, Pretoria 0001 South Africa / Acocks Chair, Schweickerdt Herbarium, Department of Botany, University of Pretoria, Pretoria, 0002 South Africa / Centre for Functional Ecology, Departamento de Ciências da Vida, Universidade de Coimbra, 3001-455 Coimbra, Portugal(email: g.smith@sanbi.org.za).

<sup>2</sup> Department of Botany, P.O.Box 77000, Nelson Mandela Metropolitan University, Port Elizabeth, 6031 South Africa/ Centre for Functional Ecology, Departamento de Ciências da Vida, Universidade de Coimbra, 3001-455 Coimbra, Portugal (email: estrelafigueiredo@hotmail.com).

**Summary:** *Agave salmiana* Otto ex Salm-Dyck subsp. *salmiana* var. *salmiana*, the typical variety of this large-growing Mexican species, is here recorded as having become established in South Africa's Eastern Cape Province. A description and key that can be used to distinguish it from *A. americana* L. subsp. *americana* var. *americana* and *A. americana* subsp. *americana* var. *expansa* (Jacobi) Gentry, both of which are large-growing and more widely naturalised in southern Africa, are provided. A comprehensive chronological synonymy summarises the complex nomenclatural and taxonomic histories of the species.

**Zusammenfassung:** *Agave salmiana* Otto ex Salm-Dyck subsp. *salmiana* var. *salmiana*, die typische Varietät dieser grosswüchsigen mexikanischen Art, wird hier als in der südafrikanischen Eastern Cape Province verwildert nachgewiesen. Eine Beschreibung und ein Bestimmungsschlüssel erlauben die Unterscheidung des Taxons von zwei weiteren grosswüchsigen, im südlichen Afrika weit verbreitet verwilderten Taxa, *A. americana* L. subsp. *americana* var. *americana* und *A. americana* subsp. *americana* var. *expansa* (Jacobi) Gentry. Eine umfassende chronologische Synonymie fasst die komplexe nomenklatorische und taxonomische Geschichte der Art zusammen.

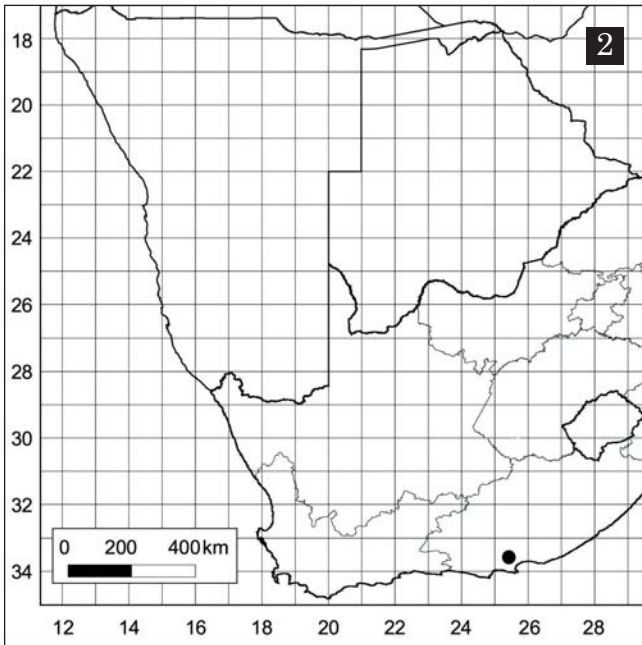
### Introduction

By definition, inventories of naturalised and invasive species compiled for specific regions are dynamic: additions are inevitably made to such lists as fieldwork and natural history observations

reveal that further species are spreading without human intervention in their adopted countries. Rather alarmingly, some species may have become quite widespread before being detected – *Furcraea foetida* (L.) Haw. in South Africa (Crouch & Smith, 2011) is a case in point – while others are fortunately noticed before they can have a serious impact on the indigenous biodiversity of their adopted countries [e.g. *Yucca aloifolia* L., also in South Africa, (Smith *et al.*, 2012)]. We here for the first time record the occurrence of *Agave salmiana* Otto ex Salm-Dyck subsp. *salmiana* var. *salmiana* as naturalised in the Eastern Cape Province of South Africa (Figure 1). This species went undetected when Smith *et al.* (2008) produced the Flora account of agaves naturalised in that Province. *A. salmiana* (subsp. *salmiana*) var. *salmiana* is described and a key is provided to distinguish it from the two large-growing varieties of *Agave americana* L. that have previously been noted as naturalised in southern Africa. Given the complex nomenclatural and taxonomic histories of *A. salmiana* (subsp. *salmiana*) var. *salmiana*, a comprehensive chronological synonymy of the taxon is provided.

### *Agave salmiana* recorded from South Africa

Several species of *Agave* L., a predominantly Mexican and Central and southern North American genus (García-Mendoza, 1998), are commonly grown in South Africa, with some having become problem plants in the country (Smith, 2011). During recent fieldwork in the Eastern Cape Province of South Africa we came across a population of



**Figure 1.** A large clump of *A. salmiana* var. *salmiana* where it became established near Redhouse in the Eastern Cape of South Africa. Photo: Gideon F. Smith. **Figure 2.** Distribution of *A. salmiana* var. *salmiana* in the Swartkops River Valley near Redhouse, near the metropolitan city of Port Elizabeth in South Africa's Eastern Cape Province. **Figure 3.** This specimen of *A. salmiana* var. *salmiana* growing near Bloemfontein in South Africa's Free State Province is nearing flowering maturity. The leaves are a dull green colour and remain erect. Photo: Gideon F. Smith.

**Key to distinguish among *Agave salmiana* (subsp. *salmiana*) var. *salmiana* and the two varieties of *Agave americana* subsp. *americana* naturalised in South Africa**

1. Inflorescences pyramid-shaped; bracts on flowering pole rounded, appearing fleshy; leaves dark green, distinctly valliculate towards apex ..... ***A. salmiana* var. *salmiana***
- 1'. Inflorescences inverted cone-shaped; bracts on flowering pole sharply elongated, leathery; leaves light blue to blue-green, not or obsolescently valliculate towards apex ..... 2
2. Leaves usually drooping to one side, adaxially not deeply channelled, thickly succulent; apical leaf spine 3–5 cm long; plants massive ..... ***A. americana* var. *americana***
- 2'. Leaves erect to stiffly spreading, adaxially deeply channelled, less succulent; apical leaf spine 2–3 cm long; plants medium-sized to large ..... ***A. americana* var. *expansa***

*Agave salmiana* (subsp. *salmiana*) var. *salmiana*, where it has become established in thicket vegetation in the Swartkops River Valley near Redhouse, near the metropolitan city of Port Elizabeth (Figure 2). Two of the agave taxa recorded as naturalised in South Africa to date, *A. americana* (subsp. *americana*) var. *americana* and *A. americana* (subsp. *americana*) var. *expansa* (Jacobi) Gentry, are also large-growing, forming massive, monocarpic rosettes (Smith & Mössmer, 1996; Smith & Figueiredo, 2011). These two varieties can be distinguished from the newly recorded *A. salmiana* var. *salmiana* using the key provided above. Size-wise, none of the other agaves naturalised in South Africa can be confused with *A. salmiana*.

*Agave salmiana* var. *salmiana* can be distinguished from *A. americana* (subsp. *americana*) var. *expansa* and *A. americana* (subsp. *americana*) var. *americana* on vegetative morphological as well as reproductive characters. The leaves of *Agave salmiana* are a dark green colour (Figure 3), more boat-shaped in outline, and especially at maturity distinctly valliculate towards the apex (Figure 4). The leaves of *A. salmiana* always remain erect and never topple to one side. In addition, its inflorescences are more pyramidal in outline than those of the two *Agave americana* varieties (Figure 5). The leaves of *Agave americana* are light blue, elongate-attenuate and the leaf apices hardly ever valliculate; those of, particularly, *A. americana* var. *americana* tend to be top heavy and topple over. The inflorescences of the two varieties of *A. americana* are inverted cone-shaped. The mammillae on which the sharp, marginal leaf teeth of *A. salmiana* are situated are mostly more prominent than in the case of the two naturalised taxa of *Agave americana*, but this character tends to be somewhat variable (Figure 6).

*Agave salmiana* var. *salmiana* has been included in *The European Garden Flora* (Couper & Cullen, 1986), as well as in *Flora europaea* (Webb, 1980), albeit under the name *A. atrovirens* Karw. ex Salm-Dyck (see Smith & Figueiredo, 2007 for a

discussion of this misidentification). However, it has not become established in Australia, another country prone to invasions by New World succulents, including agaves and cacti (Foster, 1986). Taxonomically, a further subspecies of *A. salmiana*, subsp. *crassispinia* (Trel.) Gentry, and two varieties of the subsp. *salmiana*, var. *angustifolia* A. Berger and var. *ferox* (K. Koch) Gentry, are presently widely accepted. Of these, only var. *ferox* has been recorded as naturalised in the Canary Islands (Govaerts *et al.*, 2011). However, Lodé (2010) does not mention this taxon in his guide to the indigenous and introduced succulent flora of the Canary Islands. The two agaves that are most naturalised globally, *Agave americana* and *A. sisalana* Perrine, are mentioned as occurring on the Islands though (Lodé, 2010: 320–321).

*Agave salmiana* is the most important source of pulque in Mexico, but no uses have been recorded for it in South Africa, apart from being utilised in amenity and domestic horticulture.

The synonymy of *Agave salmiana* is extensive. As a result of interest in cultivating these plants in Europe, especially during the 19<sup>th</sup> and early 20<sup>th</sup> centuries, and in a few cases even earlier (Ullrich, 1993; Richter, 2011: 15–19), a multitude of names were published for plants that were only known from cultivation. Predictably, many of these names later proved to be synonyms. The bibliography of these names is often difficult to access and many references encountered in the literature, such as nursery catalogues, can be traced today only with great difficulty, if at all. For this reason, errors in the citation of names are often perpetuated in the literature on *Agave*. We here provide as complete as possible a chronology of names applied to what is currently accepted as *A. salmiana* (subsp. *salmiana*) var. *salmiana*.

**Taxonomy of *Agave salmiana* subsp. *salmiana* var. *salmiana***

*Agave salmiana* Otto ex Salm-Dyck subsp. *salmiana* var. *salmiana*, *Bonplandia* (Hannover) 7: 88 (1859); Gentry (1982: 605); Couper &



**Figure 4.** Unlike those of other large-growing *Agave* species naturalised in South Africa, the leaf tips of *Agave salmiana* var. *salmiana* are distinctly valliculate at maturity. **Figure 5.** The inflorescences of *A. salmiana* var. *salmiana* are pyramidal in shape. **Figure 6.** The marginal leaf teeth of *A. salmiana* var. *salmiana* are usually situated on quite prominent mammillae. Photos: Gideon F. Smith.

Cullen (1986: 282); Irish & Irish (2000: 154–155); Thiede (2001: 60–61); Heller (2003: 107); Albano (2006: 51); Vásquez-García *et al.* (2007: 69–70, lxxvi–lxxvii); Guillot *et al.* (2009: 72).

Type: “México.” *fide* Espejo Serna & López-Ferrari (1993: 24). Gentry (1982: 605) stated: “Neotype: (Nothing suitable at hand to designate as type representative)”. It would therefore appear that no specimen is preserved.

**Annotated synonymy of *Agave salmiana* subsp. *salmiana* var. *salmiana* arranged chronologically**

*Agave salmiana* Hort. in Otto, *Allg. Gartenzeitung* **10**: 51 (1842), *nom. nud.*

This name was listed by Otto as “*salmiana* Hort. Berol.”, without a description. It was therefore not validly published.

*Agave jacobiana* Salm-Dyck, *Bonplandia* (Hannover) **7**: 88 (1859).

*Agave tehuacanensis* Karw. in Otto, *Allg. Gartenzeitung* **10**: 51 (1842), *nom. nud.*

This name is cited in the literature (e.g. Govaerts *et al.*, 2011) as *Agave tehuacanensis* Karw. ex Otto in the publication cited above. However, it was published without a description, thus it was not validated by Otto. Breitung (1968) considered it a synonym of *A. verschaffeltii* Lem. Govaerts *et al.* (2011) consider it a synonym of *A. atrovirens*.

*Agave tehuacanensis* Karw. ex Salm-Dyck, *Bonplandia* (Hannover) **7**: 89 (1859).

This name is not listed in the International Plant Name Index (IPNI) (2011). Trelease (1914) stated that *A. tehuacanensis* Karw. (see above) was the earliest name for *A. verschaffeltii* Lem. However, Gentry (1982) interpreted Karwinski’s name as a synonym of *A. salmiana*. Thiede (2001) considered this name a *nom. illeg.*, but all earlier citations in the literature appear to be not validly published, therefore Salm-Dyck is the validating author.

*Agave potatorum* K.Koch (1860).

This name is not listed in IPNI (2011). It was listed by Thiede (2001) as published in 1860 as a *nom. illeg.* “art. 53.1”, due to the earlier name by Zuccarini. Its publication could not be verified. Berger (1915) added to the confusion by listing the name *Agave potatorum* Hort. as a synonym of *A. coarctata* (see below). The name *A. potatorum* Zucc. [*Flora* **15**, 2 (Beiblatt 2): 96–97 (1832)] is widely accepted for a different, much smaller species.

*Agave montezumae* hort. Belg. ex Jacobi (1864).

This name was listed by Thiede (2001), but it

is not listed in IPNI (2011). The publication could not be verified.

*Agave atrovirens* W.Neubert, *Deutsch. Magaz. F. Garten- u. Blumenkunde*, heft **1** (1867).

This name is not listed in IPNI (2011), but it was listed by Thiede (2001) as a *nom. illeg.* Its publication could not be verified and it may not be validly published. There is an earlier *A. atrovirens* Karw. ex Salm-Dyck, *Hortus dyckensis* **7**: 302 (1834).

*Agave mitriformis* Jacobi, *Abh. Schles. Ges. Vaterl. Cult., Abth. Naturwiss.* **1869**: 145 (1869).

*Agave lehmannii* Jacobi, *Abh. Schles. Ges. Vaterl. Cult., Abth. Naturwiss.* **1869**: 146 (1869).

*Agave coarctata* Jacobi, *Abh. Schles. Ges. Vaterl. Cult., Abth. Naturwiss.* **1869**: 147 (1869).

*Agave cochlearis* Jacobi, *Abh. Schles. Ges. Vaterl. Cult., Abth. Naturwiss.* **1870**: 151 (1870).

?*Agave chinensis* F.P.Sm., *Contr. Mat. Med. China*: **5** (1871), *nom. nud.*

This name is listed in IPNI (2011), but is not listed by Zhanhe Ji & Meerow (2000). It was not validly published (lacking a description), and was applied to a plant grown in Taiwan. Thiede (2001) considers it of unresolved application. Govaerts *et al.* (2011) listed it as a synonym of *A. salmiana*.

*Agave salmiana* var. *cochlearis* (Jacobi) A.Terracc., *Prim. Contr. Monogr. Agave*: 51 (1885).

*Agave salmiana* var. *glauca* Becker, *Monatsschr. Kakteenk.* **8**: 150 (1898).

In this publication Becker gave the author of the name *Agave salmiana* as “Dietr.”. We were unable to locate a publication in which Dietr., presumably ‘D.Dietr.’, established the name *A. salmiana*, probably as a later homonym of *A. salmiana* Otto ex Salm-Dyck. Alternatively it could simply be an error introduced by Becker. Breitung (1968) regarded *A. salmiana* var. *glauca* as a synonym of *A. atrovirens* var. *salmiana*; we do not follow that nomenclature here. The plant figured by Becker in the protologue of the name appears to be of a form of *A. salmiana* with a more conical inflorescence than that of typical *A. salmiana*.

*Agave quotifera* Trel. ex Ochot., *Mem. Rev. Soc. Ci. Alzate Mexico* **33**: 102 (1913).

*Agave compluviata* Trel. in Bailey, *Stand. Cycl. Hort.* **1**: 234 (1914).

*Agave whitackeri* Hort. in Trelease (1914), in Bailey, *Stand. Cycl. Hort.* **1**: 234 (1914), *pro syn.*; in Berger, *Agaven*: 134 (1915), *pro syn.*; in Jacobsen, *Die Sukkulente*: 24 (1933), *pro syn.* This name has been attributed to Berger (1915, see, for example, Thiede, 2001), but Berger

cited it as '*whitackeri* Hort.' in the synonymy of *A. salmiana*. He therefore did not validate it. Earlier, Trelease (1914) had also cited '*whitackeri* Hort.' as a synonym of *A. atrovirens* var. *cochlearis* [the identity of this name is unknown as it is not clear whether it is a new combination for *Agave cochlearis* Jacobi (see above)]. Govaerts *et al.* (2011) attributed *A. whitackeri* to H.Jacobsen in *Die Sukkulenten*: 24 (1933), but there it is also listed as '*A. whitackeri* Hort.', as a synonym of *A. salmiana*. It is therefore not validly published.

*Agave potatorum* Hort. in Berger, *Agaven*: 140 (1915), *pro syn.*

This name was incorrectly referred to by Thiede (2001) as "*A. potatorum* Hort. ex A.Berger, *nom illeg.* ("art. 53.1)". Berger (1915) cited '*A. potatorum* Hort.' as a synonym of *A. coarctata*, and it is thus not a validly published name.

*Agave atrovirens* var. *sigmatophylla* A.Berger, *Agaven*: 143: (1915).

*Agave atrovirens* var. *salmiana* (Otto ex Salm-Dyck) Trel., *Contr. U. S. Natl. Herb.* 23: 130 (1920).

*Agave atrovirens* var. *salmiana* (Otto ex Salm-Dyck) Maire & Weiller, *Fl. Afr. Nord* 6: 85 (1959), *nom. illeg.*

This name is listed by Govaerts *et al.* (2011), but because this combination was made earlier by Trelease (1914), it is a *nom. illeg.*

*Agave dyckii* hort. ex Besaucèle, *Cat. Rais.*: 7 (year of publication unknown).

Berger (1915) and Thiede (2001) refer to this publication by Besaucèle, but we were unable to verify the status of names apparently established in it. *Agave dyckii* is listed by Govaerts *et al.* (2011) as published by H.Jacobsen in *Die Sukkulenten*: 24 (1933), but as noted in IPNI (2011), the name is there listed as a synonym of *A. salmiana*, and it is therefore not validly published.

*Agave caratas* hort. ex Besaucèle, *Cat. Rais.*: 8 (year of publication unknown).

*Agave salmiana* var. *contorta* hort. ex Besaucèle, *Cat. Rais.*: 7 (year of publication unknown).

*Agave salmiana* var. *mitriformis* (Jacobi) Cels.

This name was listed by Berger (1915) as a synonym of *A. mitriformis* (see above), but without details of publication. The publication of this name could not be verified.

### **Description of *Agave salmiana* subsp. *salmiana* var. *salmiana***

Large to massive, monocarpic, rosulate, leaf succulents. Stemless or with short, thick-stems. Rosettes 1–2 m tall; as wide, or more so, at

maturity; closely proliferous through basal suckers. Leaves 1.0–2.0 m × 20–30 cm, uniformly dark green, very rarely indistinctly cross-banded with lighter and darker green, broadly lanceolate, acuminate, sword-shaped, remaining erect up to flowering maturity, not becoming reflexed, thickly fleshy, deeply channelled low down adaxially, channelled upwards, convex abaxially, apex gracefully incurved, upper ¼ distinctly valliculate, apically very sharp-tipped; leaf margins armed with numerous, straight or variously recurved, simple teeth, brown to greyish brown, largest along mid-blade, mostly situated on mammillae, upper ¼ often devoid of teeth, terminal spine 4–5 cm long, dark brown, grooved above. Inflorescence massive, pyramid-shaped; flowering pole stout, to 8 m tall, closely covered with large, fleshy bracts; panicle up to 20-branched in upper ½ of pole, fir tree-like in outline, lateral side-branches carrying dense flower clusters, not bulbiferous. Flowers funnel-shaped, 8–10 cm long, thick, fleshy, erect, neck hardly constricted above ovary, bicoloured with basal (ovary) part green, tepals yellow, distinctly protandrous, completely and rapidly abscising after anthesis. Perianth with 6 basally fused tepals; tepals in two distinct whorls, of unequal length, curling inward with anthesis. Fruit not seen.

*Natural distribution range*: In its native New World *Agave salmiana* (subsp. *salmiana*) var. *salmiana* has been widely recorded from Central, Northeastern and Southwestern Mexico (Govaerts *et al.*, 2011).

*Icons*: Gentry: Figures 21.1, 21.2, 21.5, 21.12, 21.13 (1982); Albano: p. 51 (2006); Guillot *et al.*: Figures 56–60 (2009); Richter: p. 11 (2011).

*Flowering time*: The species flowers in mid-summer in South Africa.

*Eponymy*: The specific epithet commemorates Prince Joseph Franz Anton Hubert Ignaz zu Salm-Reifferscheid-Dyck (1773–1861), German botanist, artist, horticulturalist and succulent plant expert who in the first half of the 18<sup>th</sup> Century had a plant collection unrivalled in Central Europe (see Rowley, 1993).

*Common names*: Afrikaans – reuse-garingboom. English – giant century plant. French – Agave de Salman (Albano, 2006). Spanish – maguey de pulque (Irish & Irish, 2000; Vásquez-García *et al.*, 2007), maguey del Príncipe Salm-Dyck, maguey pulquero (Vásquez-García *et al.*, 2007). Known in Mexico under numerous names: Agave pulquero,

Ametl, Ayoteco, Blanco, Bo'ta, Cachro, Chalqueño, Chino, Gääx'mini, Hok'uada, K'ank'uada, Määxo, Maguey, Maguey aguamielero, Maguey amarillo, Maguey blanco, Maguey bueno, Maguey cenizo, Maguey chalqueño, Maguey chino, Maguey cimarrón, Maguey cornudo, Maguey corriente, Maguey corriente toluqueño, Maguey cuerno, Maguey de penca larga, Maguey de púa, Maguey de pulque, Maguey espina que rasga, Maguey grande, Maguey manos largas, Maguey manso, Maguey prieto, Maguey pulquero, Maguey puya larga, Maguey verde, Maguey verde de cerro, Mayeé, Metl, M'ondat'ax'uada, Mu'ta, Poblano, Sha'mini, Tash-huadá, Taxi huada, Taxihuada, Teometl, Tlacametl, Toluqueño, Tsam'niuada, Uña de gato, Verde, Xa' mni, Xaa'mini, Xamini, Yavi incoyo (Colunga García Marín, 2006).

### Acknowledgements

We are grateful to an anonymous referee for suggesting improvements to the manuscript.

### References

- ALBANO, P.-O. (2006). *Les Yuccas, Agaves et Aloès, pas à pas. Une ambiance de bout du monde dans votre jardin*. Édisud, Aix-en-Provence.
- BERGER, A. (1915). *Die Agaven. Beiträge zu einer Monographie*. Gustav Fischer Verlag, Jena.
- BREITUNG, A.J. (1968). *The agaves. The Cactus and Succulent Journal 1968 Yearbook*. GLASS, C. & FOSTER, R.A. (eds.). Abbey Garden Press, Reseda, California.
- COLUNGA GARCÍA MARÍN, S. P. (2006). Base de datos de nombres técnicos o de uso común en el aprovechamiento de los agaves en México. Centro de Investigación Científica de Yucatán AC. SNIB-CONABIO proyecto No. CS007. México. D. F. <http://www.conabio.gob.mx/institucion/proyectos/resultados/Anexo1%20CS007.pdf> (accessed Aug. 2011).
- COUPER, C.J. & CULLEN, J. (1986). Agavaceae. 5. *Agave* Linnaeus. In WALTERS, S.M., BRADY, A., BRICKELL, C.D., CULLEN, J., GREEN, P.S., LEWIS, J., MATTHEWS, V.A., WEBB, D.A., YEO, P.F. & ALEXANDER, J.C.M. (eds.), *The European Garden Flora. Volume 1. Pteridophyta, Gymnospermae, Angiospermae—Monocotyledons (Part I)*. Cambridge University Press, Cambridge, pp. 278–282.
- CROUCH, N.R. & SMITH, G.F. (2011). Agavaceae. *Furcraea foetida*: an invading alien in South Africa. *Bothalia* **41**: 196–199.
- ESPEJO SERNA, A. & LÓPEZ-FERRARI, A. R. (1993). *Las monocotiledoneas Mexicanas. Una sinopsis florística. 1. Lista de referencia. Parte I. Agavaceae, Alismaceae, Alliaceae, Alstroemeriaceae y Amaryllidaceae*. Consejo Nacional de la Flora de México, A.C. & Universidad Autónoma Metropolitana-Iztapalapa, México, D.F.
- FORSTER, P.I. (1986). 2. *Agave*. In GEORGE, A.S. (ed.), *Flora of Australia* **46**: 72–76. Australian Government Publishing Service, Canberra.
- GARCÍA-MENDOZA, A. (1998). *Con sabor a maguey. Guía de la Colección Nacional de Agaváceas y Nolináceas del Jardín Botánico, Instituto de Biología-UNAM*. Universidad Nacional Autónoma de México & Sistemas de Información Geográfica, S.A. de C.V., México, D.F.
- GENTRY, H.S. (1972). *The Agave family in Sonora*. Agriculture Handbook No. **399**. Agricultural Research Service, United States Department of Agriculture, Washington.
- GENTRY, H.S. (1982). *Agaves of continental North America*. The University of Arizona Press, Tucson.
- GOVAERTS, R., ZONNEVELD, B.J.M. & ZONA, S.A. (2011). World Checklist of Asparagaceae. Facilitated by the Royal Botanic Gardens, Kew. Published on the Internet; <http://apps.kew.org/wcsp/> (accessed 22 Jan. 2011).
- GUILLOT, D. ORTIZ, VAN DER MEER, P., LAGUNA, E. LUMBRERAS & ROSSELLÓ, J. A. PICORNELL (2009). *El género Agave L. en la flora alóctona valenciana*. Monografías de la revista Boute-loua no. 3. Jolube Editor y Consultar Ambiental Flora montiberica, Valencia.
- HELLER, T. (2003). *Agaven*. Natur und Tier Verlag, Münster.
- IPNI. (2011). The International Plant Names Index. <http://www.ipni.org/>
- IRISH, M. & IRISH, G. (2000). *Agaves, Yuccas, and related plants. A gardener's guide*. Timber Press, Portland.
- LODÉ, J. (2010). *Succulent plants of the Canary Islands. Identification easy guide*. Turquesa, Publicaciones Turquesa, S.L., Santa Cruz de Tenerife.
- RICHTER, I. (2011). *Die Gattung Agave. Geschichte, Systematik, Vorkommen, Kultur*. Associazione Italiana Amatori delle piante Succulente (A.I.A.S.), place of publication unknown.
- ROWLEY, G.D. (1993). Salm-Dyck's catalogues. *Taxon* **42**: 845–851.
- SMITH, G.F. (2003). Agavaceae. In GERMISHUIZEN, G. & MEYER, N.L. (eds.), *Plants of southern Africa: an annotated checklist*. *Strelitzia* **14**: 955. National Botanical Institute, Pretoria.
- SMITH, G.F. (2011). Agavaceae. In WALTERS, M., FIGUEIREDO, E., CROUCH, N.R., WINTER, P., SMITH, G.F., ZIMMERMANN, H. & MASHOPE, B. K., *Naturalised and invasive succulents of southern Africa*. ABC Taxa **11**. The Belgian Development Cooperation, Brussels.

- SMITH, G.F., FIGUEIREDO, E. & CROUCH, N.R. (2012). A first record of *Yucca aloifolia* L. (Agavaceae / Asparagaceae) naturalized in South Africa with notes on its uses and reproductive biology. *Haseltonia* **17**: 87–93.
- SMITH, G.F. & FIGUEIREDO, E. (2007). Naturalized species of *Agave* L. (Agavaceae) on the southeastern coast of Portugal. *Haseltonia* **13**: 52–60.
- SMITH, G.F. & FIGUEIREDO, E. (2011). *Agave americana* L. (subsp. *americana*) var. *americana* var. *expansa* (Jacobi) Gentry (Agavaceae) naturalized in South Africa. *Bradleya* **29**: 67–72.
- SMITH, G.F. & KLOPPER, R.R. (2007). Naturalised species of *Agave* L. (Agavaceae) in the Cape Floristic Region, South Africa. *Bradleya* **25**: 193–195.
- SMITH, G.F. & MÖSSMER, M. (1996). *FSA* contributions 4: Agavaceae. *Bothalia* **26**: 31–35.
- SMITH, G.F., WALTERS, M., FIGUEIREDO, E. & KLOPPER, R.R. (2008). Naturalised species of *Agave* (Agavaceae) in the Eastern Cape Province of South Africa. *Bradleya* **26**: 33–40.
- THIEDE, J. (2001). *Agave*. In EGGLI, U. (ed.), *Illustrated handbook of succulent plants. Monocotyledons*. Springer-Verlag, Berlin, pp. 6–76.
- TRELEASE, W. (1914). *Agave*. In BAILEY, L.H., *The standard cyclopedia of horticulture* **1**: 230–239. MacMillan, New York.
- ULLRICH, B. (1993). *Agave. Illustrationen blühender Exemplare bis 1800. Palmengarten Sonderheft* 21. Palmengarten, Stadt Frankfurt am Main.
- VÁSQUEZ-GARCÍA, J.A., CHÁZARO B., M.J., HERNÁNDEZ V., G., VARGAS-RODRÍGUEZ, Y.L. & PILAR ZAMORA T., M. (2007). Taxonomía del género *Agave* en el occidente de México: una panorámica preliminar. In VÁSQUEZ-GARCÍA, J.A., CHÁZARO B., M.J., HERNÁNDEZ VERA, G., BERRIOS, E.F. & VARGAS-RODRÍGUEZ, Y.L. (eds.) *Agaves del Occidente de México. Serie Fronteras de Biodiversidad*, **3**. Universidad de Guadalajara-CUCBA, México, pp. 38–82.
- WEBB, D.A. (1980). CLXXXIV. Agavaceae. 1. *Agave* L. In TUTIN, T.G., HEYWOOD, V.H., BURGESS, N.A., MOORE, D.M., VALENTINE, D.H., WALTERS, S.M. & WEBB, D.A. (eds.), *Flora Europaea. Volume 5. Alismataceae to Orchidaceae (Monocotyledones)* **5**: Cambridge University Press, Cambridge, pp. 74–75.
- ZHANHE JI & MEEROW, A.W. (2000). *Agave* Linnaeus. *Flora of China* **24**: 270–271.