Phytotaxa 222 (1): 051–060
www.mapress.com/phytotaxa/

Article

ISSN 1179-3155 (print edition)
PHYTOTAXA
ISSN 1179-3163 (online edition)

http://dx.doi.org/10.11646/phytotaxa.222.1.5

Massonia bakeriana (Asparagaceae, Scilloideae), a new pustulate species from the Northern Cape Province (South Africa)

MICHAEL PINTER[1], MARIO MARTÍNEZ-AZORÍN[1,2], MANUEL B. CRESPO[2] & WOLFGANG WETSCHNIG[1,*]
[1]*Institute of Plant Sciences, NAWI Graz, Karl-Franzens-University Graz, Holteigasse 6, A-8010, Graz, Austria;*
e-mail: wolfgang.wetschnig@uni-graz.at
[2]*dCARN & CIBIO (Instituto Universitario de la Biodiversidad), Universidad de Alicante, P. O. Box 99, E-03080 Alicante, Spain.*
[*]*author for correspondence*

Abstract

As part of a taxonomic revision of the genus *Massonia*, a new species, *M. bakeriana*, is here described from the Northern Cape (South Africa). This species is at first sight similar to *M. echinata* and *M. mimetica*, but it differs in vegetative, floral, and molecular characters as well as by its ecology and distribution. A complete morphological description of the new species and data on biology, habitat, and distribution are presented.

Key words: Hyacinthaceae, Massonieae, Taxonomy

Introduction

Asparagaceae subfamily Scilloideae tribe Hyacinthae is alternatively treated as Hyacinthaceae subfamily Hyacinthoideae, a treatment we favour based on morphology and molecular data (Martínez-Azorín *et al.* 2013, 2014a, 2014b, 2015, Pinter *et al*. 2013, Speta 1998a, 1998b, Wetschnig *et al.* 2014).

Our current studies show that the taxonomy of *Massonia* Houttuyn (1780: 424) is not satisfactory as several species were reduced to synonymy, although they represent well-defined species based on distinct morphological and ecological differences (Wetschnig *et al.* 2012, 2014, Pinter *et al*. 2013, Martínez-Azorín *et al.* 2013, 2014a, 2014b, 2015). A considerable step to clarify some of these species concepts was the correct identification of *M. pustulata* Jacquin (1791: 177) and the substitution of *M. pustulata* auct. with *M. longipes* Baker (1897: 411) (Wetschnig *et al.* 2012).

In the framework of a taxonomic revision of *Massonia*, the study of plants cultivated in several private plant collections in Europe named '*Massonia pustulata* Loeriesfontein' and herbarium collections revealed that they represent an undescribed species. At first sight this new species is related to *M. echinata* Linnaeus (1782: 193) sensu Müller-Doblies & Müller-Doblies (1997) and *M. mimetica* Martínez-Azorín *et al.* (2013: 191). Distinct morphological and ecological features support, however, the introduction of a new species, here described as *Massonia bakeriana*.

Materials and Methods

Detailed morphological studies of *Massonia bakeriana, M. echinata* and *M. mimetica* from the Northern Cape Province of South Africa were undertaken on natural populations and cultivated specimens (Martínez-Azorín *et al.* 2007, 2009). Table 1 lists the specimens examined and the number of individuals included in the morphological studies. Specimens from the following herbaria ABH, B, BLFU, BOL, BR, E, G, GZU, GRA, HAL, J, K, L, LI, M, MO, NBG, NU, NY, P, PRE, S, TCD, UPS, WIND, WU, Z, ZSS and ZT (acronyms according to Thiers 2015) were studied (see also Appendix 1). Orthography of geographical names and grid-number system follows Leistner & Morris (1976). Morphological measurements and illustrations of leaves were performed on fresh and on herbarium material from wild plants. Morphological measurements of flower parameters were done on specimens of cultivated plants. It has

Accepted by Lorenzo Peruzzi: 16 Jul. 2015; published: 7 Aug. 2015

been shown that cultivated *Massonia* plants retain the size and proportions of wild flowers (Wetschnig *et al.* 2012, Martínez-Azorín *et al.* 2013, 2014a, 2014b, Pinter *et al.* 2013). SEM-micrographs of the leaf-surface: an 8 × 5 mm section of one fresh leaf was fixed in 70% ethanol. After substitution of ethanol by acetone critical point drying was performed using a Baltec CPD030. The leaf then was mounted on aluminium stubs and coated with gold in an Agar sputter coater. Electron micrographs were obtained with a Philips XL 30 ESEM scanning electron microscope (SEM) operating at 20 kV. Author names of the cited taxa follow IPNI (2015). *Massonia echinata* L.f. is treated in the sense of Müller-Doblies & Müller-Doblies (1997).

TABLE 1. Populations and number of specimens examined of *Massonia bakeriana* M.Pinter, Mart.-Azorín & Wetschnig and related taxa for the morphological studies, including voucher and locality information. Vouchers are deposited at ABH, GRA, GZU, K, P and PRE. Abbreviations: WW—Wolfgang Wetschnig; MMA—Mario Martínez-Azorín.

Taxon	Voucher	Plants studied	Locality
M. bakeriana	*A. le Roux* (photo!)	1	ZAF: 3017BB, Kamieskroon
	Drège 2683c (P01855936 photo!)	1	ZAF: 3018AA, Pedroskloof
	A. Summerfield (photo!)	1	ZAF: 3019CC, Brandkraal Farm
	WW 04971 (GZU)	1	ZAF: 3019CD, Loeriesfontein
	J. Maule (photo!)	1	ZAF: 3119AA, Eselskop
	D. Human (photo!)	1	ZAF: 3120BC, Jan Swartsberge
	M.F. Thompson 3155 (PRE0549801-0!, PRE0488986-0!, PRE0513174-0!)	4	ZAF: 3120DB, Slangberge
M. echinata	*WW 03970* (GZU)	5	ZAF: 3119AC, Vanrhyns Pass
	WW 03971 (GZU)	2	ZAF: 3119AC, Vanrhyns Pass
	WW 03972 (GZU)	1	ZAF: 3119AC, Vanrhyns Pass
	WW 03974 (GZU)	2	ZAF: 3119AC, Hantam Bot. Garden
	WW 03975 (GZU)	4	ZAF: 3119AC, Hantam Bot. Garden
M. mimetica	Anonymus (photo!)	1	ZAF: 3018AB, S of Gamoep
	MMA732 (GRA, ABH, GZU, K, type)	7	ZAF: 3018AD, Platbakkies
	WW04907 (GZU photo!)	6	ZAF: 3018AD, Platbakkies
	D.S. Hardy 114 (PRE0050997-0!)	1	ZAF: 3018BC, Farm Bounste Vlei
	B. Schumann (iSpot, photo!)	1	ZAF: 3122CC, SW of Loxton
	F. Avenant (photo!)		ZAF: 3123AC, Victoria West

Description of the new species

Massonia bakeriana M.Pinter, Mart.-Azorín & Wetschnig ***sp. nov.*** (Figs. 1−6).

Species notabilis ab Massonia echinata et M. mimetica primo aspectu aemulans, sed eis propria combinatione characterum facile distinguitur foliis pallide viridulis, pustulis 0.6−1 mm in diam.; perigonii tubo ad faucem valde aperto, egibboso laevique (in illis 6 *gibbis munito, quae ovarium occultans); filamentis albidis a basi breve connatis (ca. 1 mm long.); et antheris purpureo-violaceis. A priore insuper etiam differt foliarum pustulis majoribus et trichomatibus apicalis destitutis (in illa 0.3−0.4 mm diam. et trichomate unico apicale munitis). A posteriore insuper multo discrepat etiam foliis supra non cinnamomeis, pustulis foliarum minoribus (in illa 1−2 mm diam.); et tubo filamentorum non purpureo maculato.*

Type:—SOUTH AFRICA. Northern Cape, Williston (3120): Slangberge, south of Williston (-DB), southwest slopes of kloof, common between and under rocks, 1220 m elevation; flowers whitish to pink, 19 May 1976, *M.F. Thompson 3155* (holotype PRE0549801-0!, isotypes PRE0488986-0!, PRE0513174-0!)

Herbaceous perennial plant. Bulb ovoid to subglobose, tunicate, 20−30 × 20−28 mm, inner tunics fleshy and white, outer tunics leathery and brownish. Leaves 2, deciduous, opposite, spreading and appressed to the ground, synanthous, ovoid to suborbicular with obtuse apex, with a short apicule < 1 mm long, (4−)6−8(−10) × (5−)6−8(−10) cm, with entire to minute papillose margins; adaxial side glabrous, pale green, with symmetrical, cone-like, dark green, (11−)15−30(−42) emergences/cm^2, 0.6−1 mm in diam., with a small apical papilla; abaxial side smooth, green. Inflorescence a dense,

subcapitate raceme, up to 20−30 mm long, with 15−20 flowers, shortly overtopping ground level. Bracts lanceolate, long acuminate, 15−24(−30) × 5−10(−14) mm, membranous, green in the upper half and white below, with slightly darker green venation, glabrous with entire margins. Pedicels 10−14 mm long. Flowers tubular, funnel-shaped above. Perigone white, free segments (6−)7−8 × 1.2−2 mm with a short greenish central band at the tip, first straight and erect, later spreading and finally at anthesis strongly reflexed with a slight curve at the base. Perigone-filaments tube 9−13 × (2−)2.5−4 mm, cylindrical, funnel-shaped above, bearing a wide open mouth that shows the ovary in apical view. Filaments white, (12−)14−16(−18) mm long, in young flowers sometimes unequal in length, connate at the base for less than 1 mm forming a short filaments-tube above the perigone-filaments tube, spreading, straight, aligned at the same angle as the funnel-shaped tube, attenuate; anthers 2−3 mm long when closed, oblong, violet-purple, dorsifixed, pollen yellow. Ovary narrowly oblong, greenish with a violet to purplish tinge, 5−6 × 1.7−2 mm, slightly contracted at the joint with the style. Style white, slender, gradually tapering to the apex, 16−20 mm long, curved, with a bend at the apex. Capsule loculicidal, 10−12 × 7−10 mm, valves splitting down to the base, oblong in lateral view and trigonous with blunt edges in apical view. Seeds globose, glossy black, ca. 1.4−1.6 × 1.3−1.6 mm, smooth.

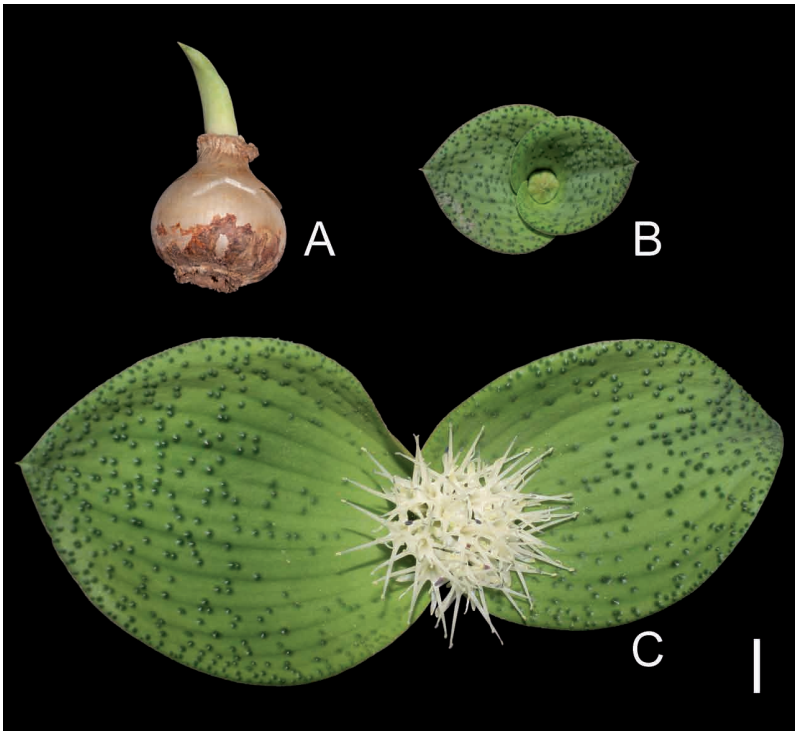

FIGURE 1. Habit of *Massonia bakeriana* M.Pinter, Mart.-Azorín & Wetschnig flowering in cultivation from Loeriesfontein (*WW04971*). A. Bulb; B. Sprouting plant; C. Plant at anthesis. Scale bar: 1 cm.

Eponymy:—The specific epithet '*bakeriana'* honours John Gilbert Baker (1834–1920), for his leading work on *Massonia* and influential treatment of the genus in Flora Capensis (1897).

Biology:—In wild populations leaves are found from April to May. *Massonia bakeriana* flowers around May in the natural habitat, whereas in cultivation in a greenhouse in the Northern Hemisphere the leaves appear in September and it flowers from October to November.

Distribution:—The new species is known to us from three main areas: the Kamiesberg area, in the surroundings of Kamieskroon; the surroundings of Loeriesfontein and Calvinia on the Bokkeveld Plateau; and the Jan Swartsberge and Slangberge, W and SW of Williston, N of the Roggeveld (Fig. 7). The new species appears to be common in the Jan Swartsberge and the Slangberge.

Habitat:—*Massonia bakeriana* seems to be confined to rocky areas. In the Kamiesberg and the Bokkeveld Plateau, it grows between 700 and 1000 m of elevation, and in the Jan Swartsberge and Slangberge it occurs in elevations between 1000 and 1300 m. The Kamiesberg localities fall within the Succulent Karoo Biome, Kamiesberg Mountains Shrubland (SKn6) and also in the Fynbos Biome, Namaqualand Granite Renostersveld (FRg1). Localities on the Bokkeveld Plateau also fall within the Succulent Karoo Biome, Namaqualand Klipkoppe Shrubland (SKn1); Hantam Karoo (SKt2); and Knersvlakte Shale Vygieveld (SKk4). In the Swartsberge and Slangberge, W and SW of Williston localities are found mostly confined to the Nama-Karoo Biome, Upper Karoo Hardeveld (NKu2); they could also occur in the Western Upper Karoo (NKu1) (Mucina & Rutherford 2006).

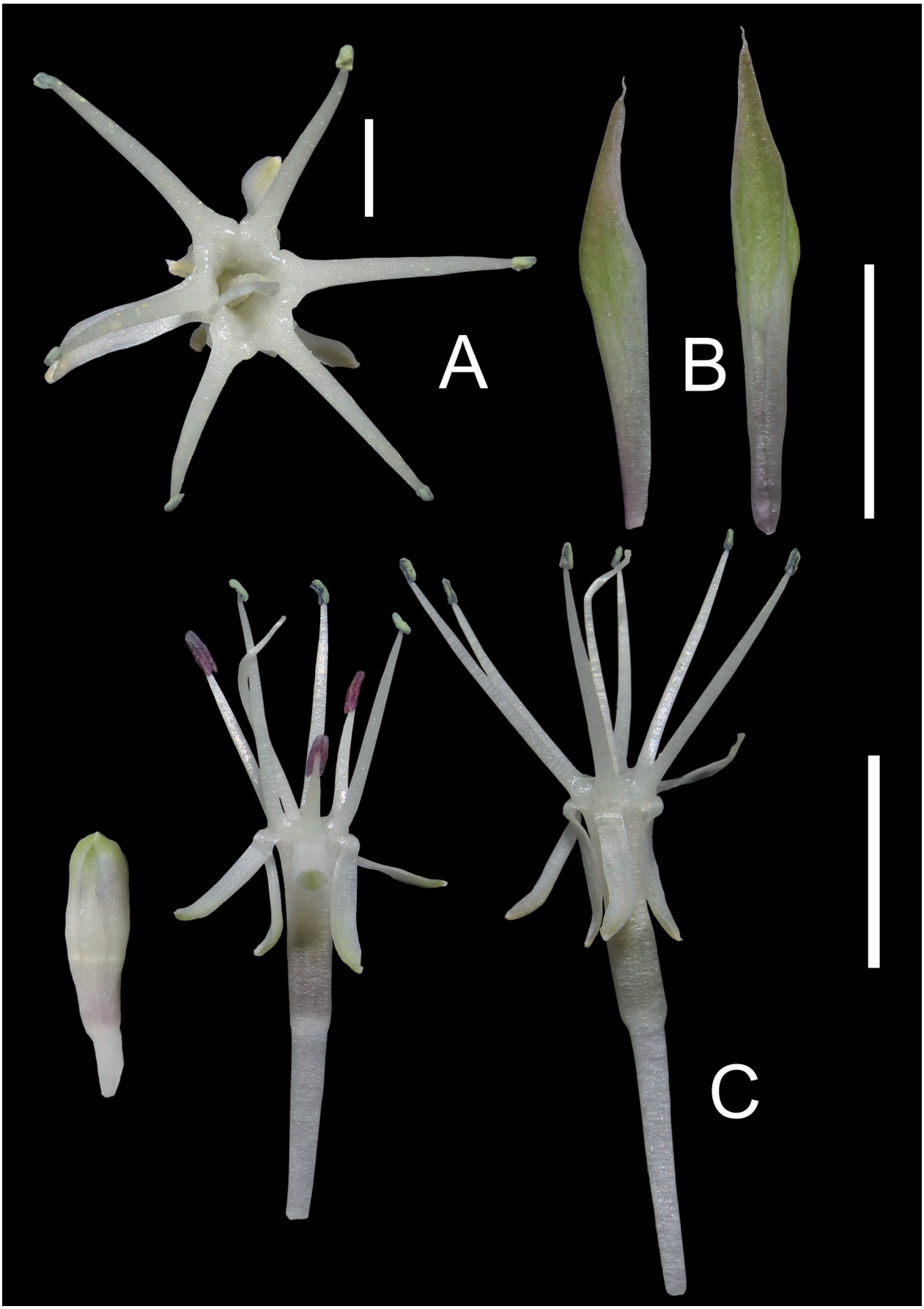

FIGURE 2. Flower and bract morphology of *Massonia bakeriana* M.Pinter, Mart.-Azorín & Wetschnig flowering in cultivation from Loeriesfontein (*WW04971*). A. Mature flower in apical view; B. Bracts; C. Development of flowers from the bud (on the left) to full anthesis (on the right). Scale bars: A: 0.5 cm; B, C: 1 cm.

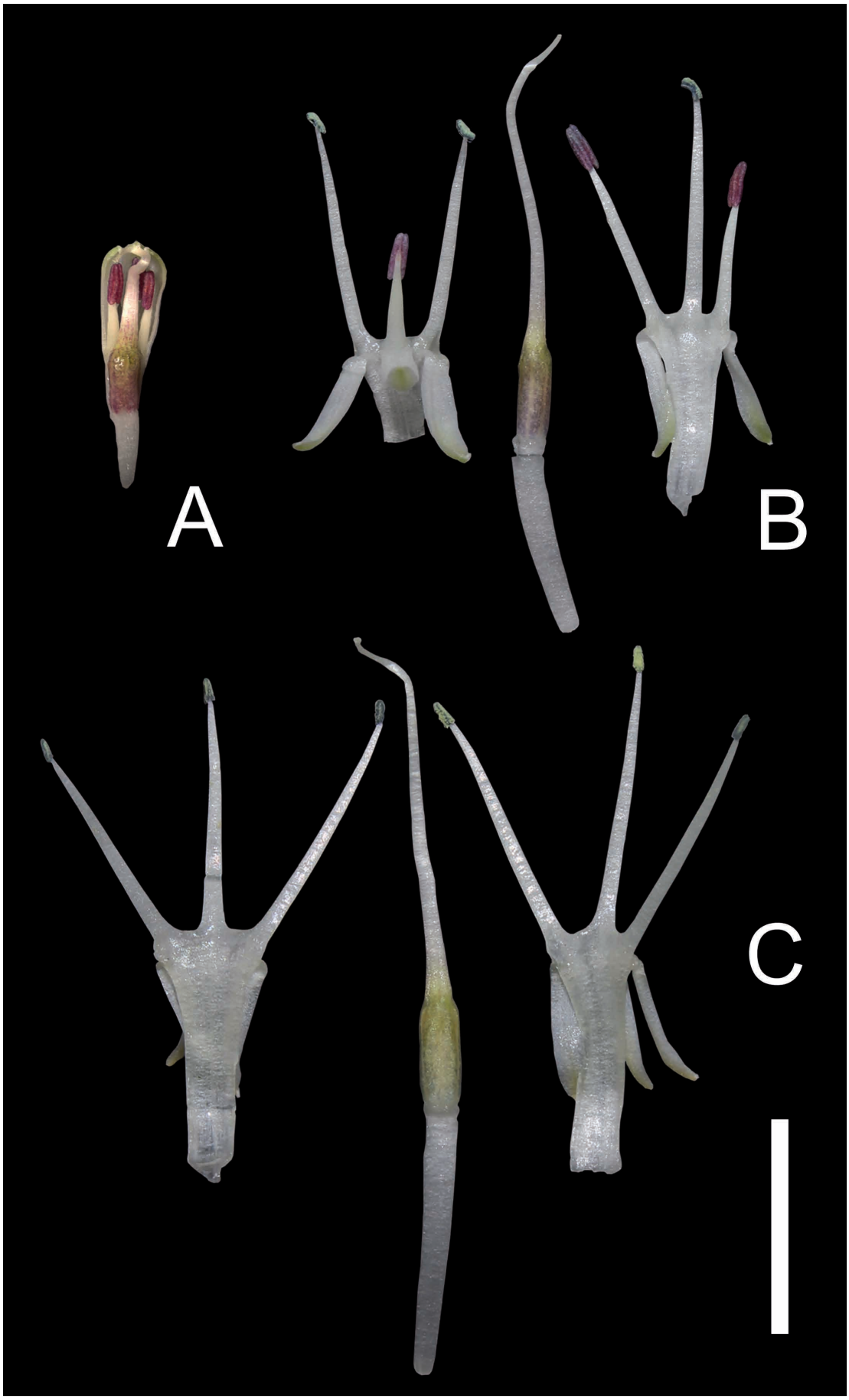

FIGURE 3. Dissected flowers of *Massonia bakeriana* M.Pinter, Mart.-Azorín & Wetschnig flowering in cultivation from Loeriesfontein (*WW04971*). A. Bud; B. Young flower; C. Flower at anthesis. Scale bar: 1 cm.

TABLE 2. Comparison of main characters of *Massonia bakeriana* M.Pinter, Mart.-Azorín & Wetschnig and the two related species.

	M. bakeriana	***M. mimetica***	***M. echinata***
Leaf length (cm)	(4−)6−8(−10)	(3.5−)5−9(−10)	(4−)6−14
Leaf width (cm)	(5−)6−8(−10)	(3−)4−8(−9)	3−8
Leaf colour	pale green	orange-brown	green
Emergences number/cm^2	(11−)15−30(−42)	10−25	0−30
Emergences diameter (mm)	0.6−1	1−2	0.3−0.4
Perigone-filaments tube length (mm)	9−13	(6−)9−15	(8−)11(−14)
Perigone-filaments tube width (mm)	(2−)2.5−4	2.5−4	(2−)4
Perigone-filaments tube mouth	funnel-shape, wide open, without gibbosities	narrow, with gibbosities	narrow, usually with gibbosities
	white	flushed of red	white
Filament length (mm)	(12−)14−16(−18)	(6–)7–13	8−13
Filaments-tube length (mm)	< 1	1−2	0−0.5
Anther length before opening (mm)	2−3	2−2.5	2−3
Anther colour	violet to purplish	pale orange with a red flush or purplish-bluish	pale blue-violet
Ovary length (mm)	5−6	3−4.5	4−5
Ovary width (mm)	1.7–2	2−2.5	2
Style length (mm)	16−20	(11−)14−20	(14−)15(−20)
Style disposition	usually bend in the apical portion	straight	straight

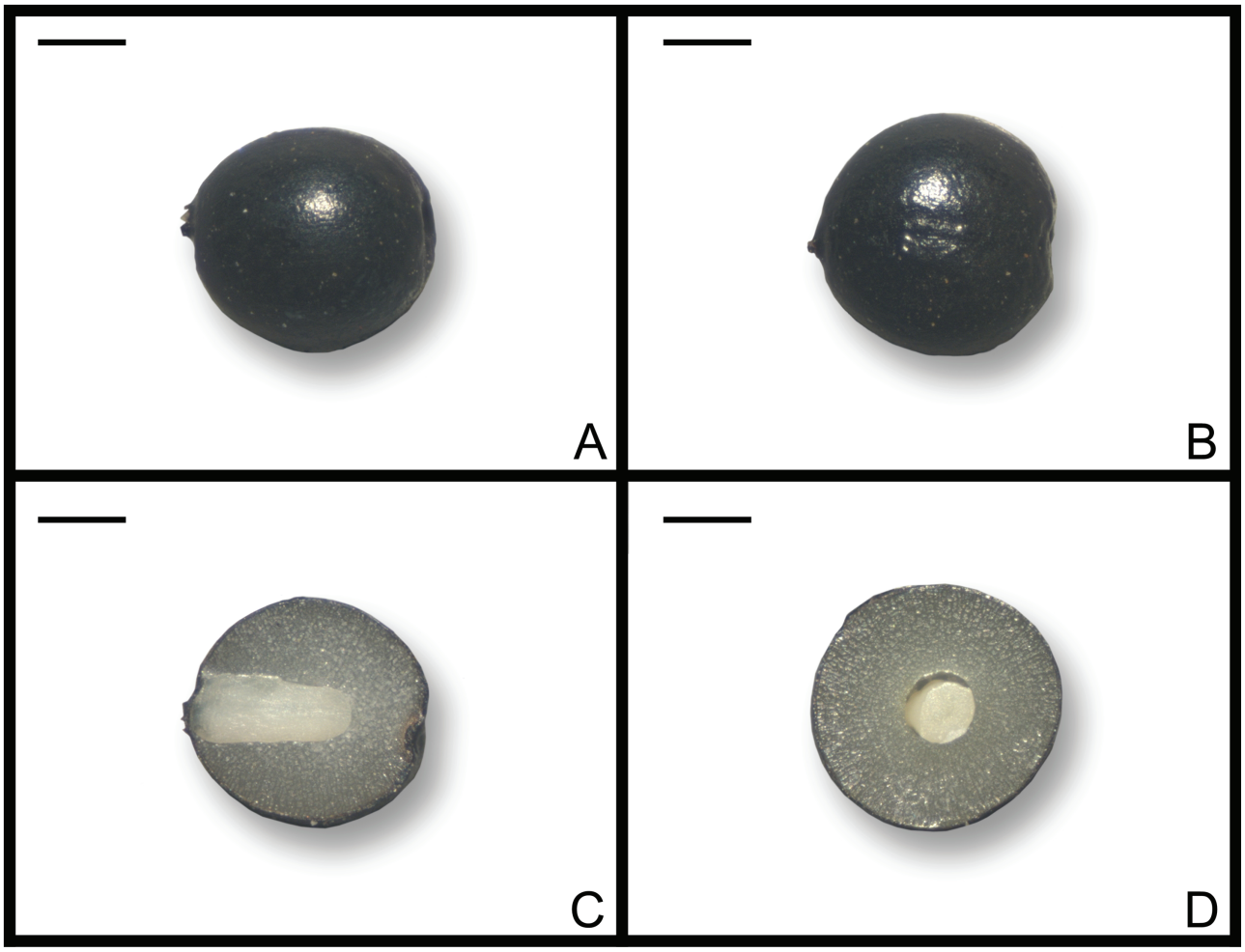

FIGURE 4. Seed morphology of *Massonia bakeriana* M.Pinter, Mart.-Azorín & Wetschnig. A. Seed, lateral view; B. Seed, raphal view; C. Seed, longitudinal section; D. Seed, transversal section. Scale bars: 0.5 mm.

Taxonomic relationships:—*Massonia bakeriana* is at first sight related to *M. echinata* and *M. mimetica* based on flower and leaf morphology. It also shares similar distribution ranges with the latter two species (Fig. 7). However, *Massonia bakeriana* differs from both latter species by the reflexed free portions of perigone segments at anthesis, lacking a strong sigmoid curve at the base; the wide open, funnel-shape mouth of the perigone-filaments tube lacking gibbosities, where the ovary is visible in apical view; the longer filaments and ovary; and the style usually bend in the apical portion (Figs. 2−3; Table 2). *Massonia bakeriana* shares with *M. echinata* the green leaves bearing emergences and the white flowers, but the latter differs by its leaves with less and smaller emergences bearing a hair instead of a papilla on top (Figs. 5, 6); flowers tubular with narrow mouth of the tube, usually having gibbosities; free portion of perigone segments at anthesis with a strong sigmoid curve; filaments and ovary shorter; and the style straight (Table 2). *Massonia bakeriana* shares with *M. mimetica* the distinctly pustulate leaves, showing emergences with a papilla on top (Figs. 5, 6), but the latter differs by the leaves being orange-brown or cinnamon-coloured; the flowers cream-white to pale-yellow; free portion of perigone segments at anthesis with a strong sigmoid curve at the base; the filaments-tube tinged with reddish; the shorter filaments and ovary; and the straight style (Martínez-Azorín *et al.* 2013). Other species with pustulate leaves, like *M. longipes* and *M. pustulata*, differ from *M. bakeriana* by the ovary truncate at the apex and clearly differentiated from the narrow style. Furthermore other differences on flower and leaf morphology are shown in Wetschnig *et al.* (2012). There are also important differences in ecology of *M. bakeriana* and its closest relatives. Whereas *Massonia mimetica* appears to be confined to high-altitude inland plateaus supporting deep, red sandy soils, where the peculiar leaves show mimesis of the environment, *M. bakeriana* occurs in adjacent mountainous regions and grows in rocky habitats. *Massonia echinata* grows in course-grained sandy soils and hard-stony clay.

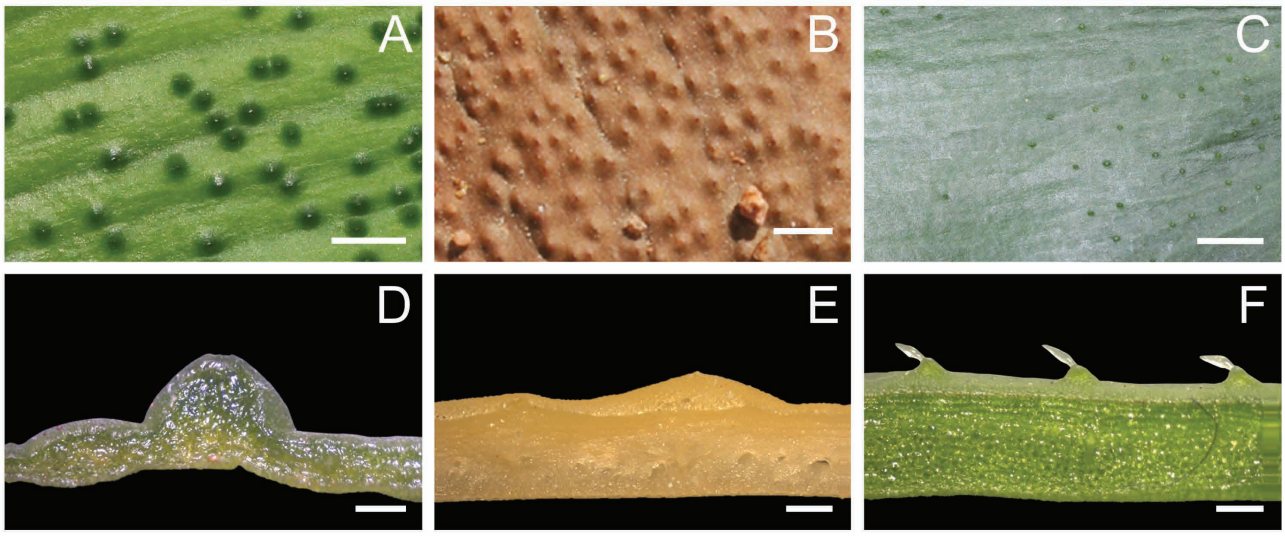

FIGURE 5. Leaf surface and emergence morphology in the studied *Massonia* species. A, D. *M. bakeriana* M.Pinter, Mart.-Azorín & Wetschnig. B, E. *M. mimetica* Mart.-Azorín, M.Pinter, M.B.Crespo & Wetschnig. C, F. *M. echinata* L.f. A–C: apical view of leaf surface; D–F: section of leaf with emergence morphology in lateral view. A–D, F fresh leaves, E fixed leaf. Scale bars: A–C: 0.5 cm; D–F: 0.5 mm.

Molecular data:—In our preliminary phylogenetic studies (Martínez-Azorín *et al.*, unpublished data) *Massonia bakeriana*, *M. echinata* and *M. mimetica* form a monophyletic group within the genus which is well supported, a placement that agrees with their shared morphological characters. Moreover, they all show differences in their DNA sequences supporting segregation at the species rank. A more complete sampling of *Massonia* including a higher number of taxa and additional markers is ongoing.

Additional specimens studied (paratypes):—SOUTH AFRICA. Northern Cape. Hondeklipbaai (3017): Kamieskroon, *A. le Roux* (photo!); Kamiesberg (3018): Bergplätze bei [mountainous areas near] Pedroskloof (-AA), 1 November 1839, *Drège 2683c* (P01855936 photo!); Loeriesfontein (3019): Brandkraal Farm (-CC) [as *M. echinata*] (photo! in *Summerfield* (2004: 29)); Loeriesfontein (3019): Loeriesfontein)); Loeriesfontein (-CD), grown from seeds ex *Gordon Summerfield 3820*, *WW04971* (GZU!); Calvinia (3119): Eselskop (-AA), *Jiří Maule* (photo!, http://www.zelenelisty.cz/clanky/werbar---cibuloviny/massonia-pustulata.html); Williston (3120): Jan Swartsberge ca. 30 km W of Williston (-BC), 19 April 2014 in bud, *D. Human* (photo!); Williston (3120): Slangberge, south of Williston, southwest slopes of kloof (-DB), 1220 m elevation, common between and under rocks, flowers whitish to pink, 19 May 1976, *M.F. Thompson 3155* (PRE0549801-0!, PRE0488986-0!, PRE0513174-0!).

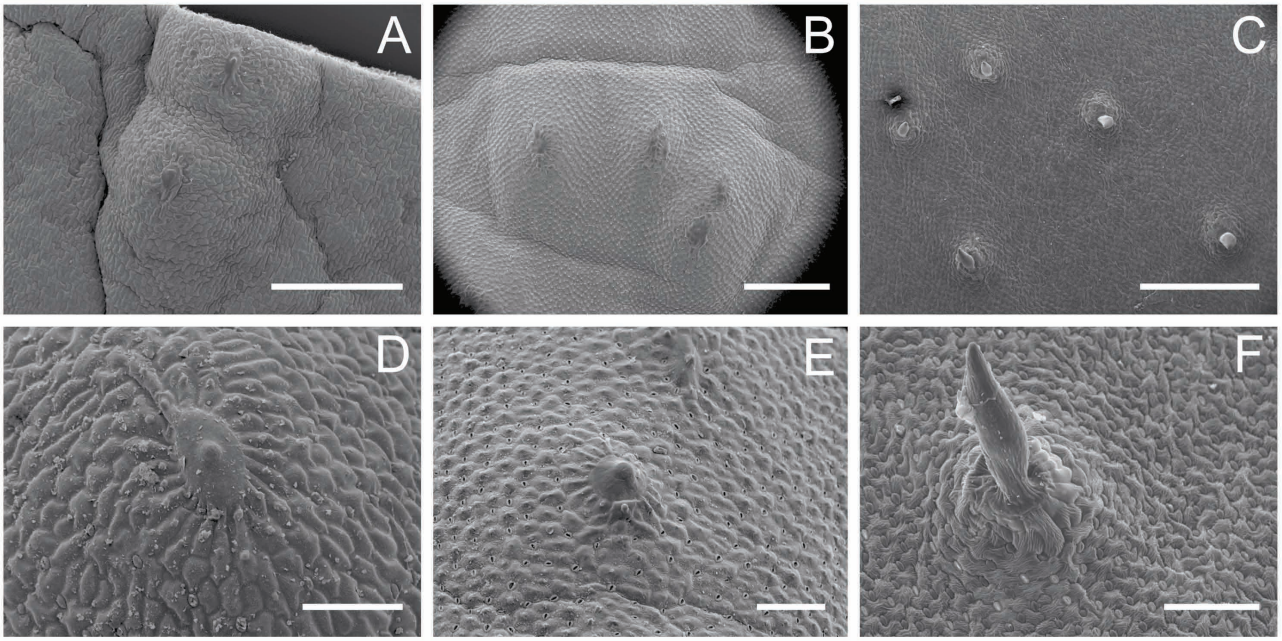

FIGURE 6. SEM micrographs of leaf surface showing emergence morphology in the studied *Massonia* species. A, D. *M. bakeriana* M.Pinter, Mart.-Azorín & Wetschnig. B, E. *M. mimetica* Mart.-Azorín, M.Pinter, M.B.Crespo & Wetschnig. C, F. *M. echinata* L.f. A–C: general view of leaf surface; D–F: detail of pustules morphology in apical view. Scale bars: A–C: 1 mm; D–F: 0.2 mm.

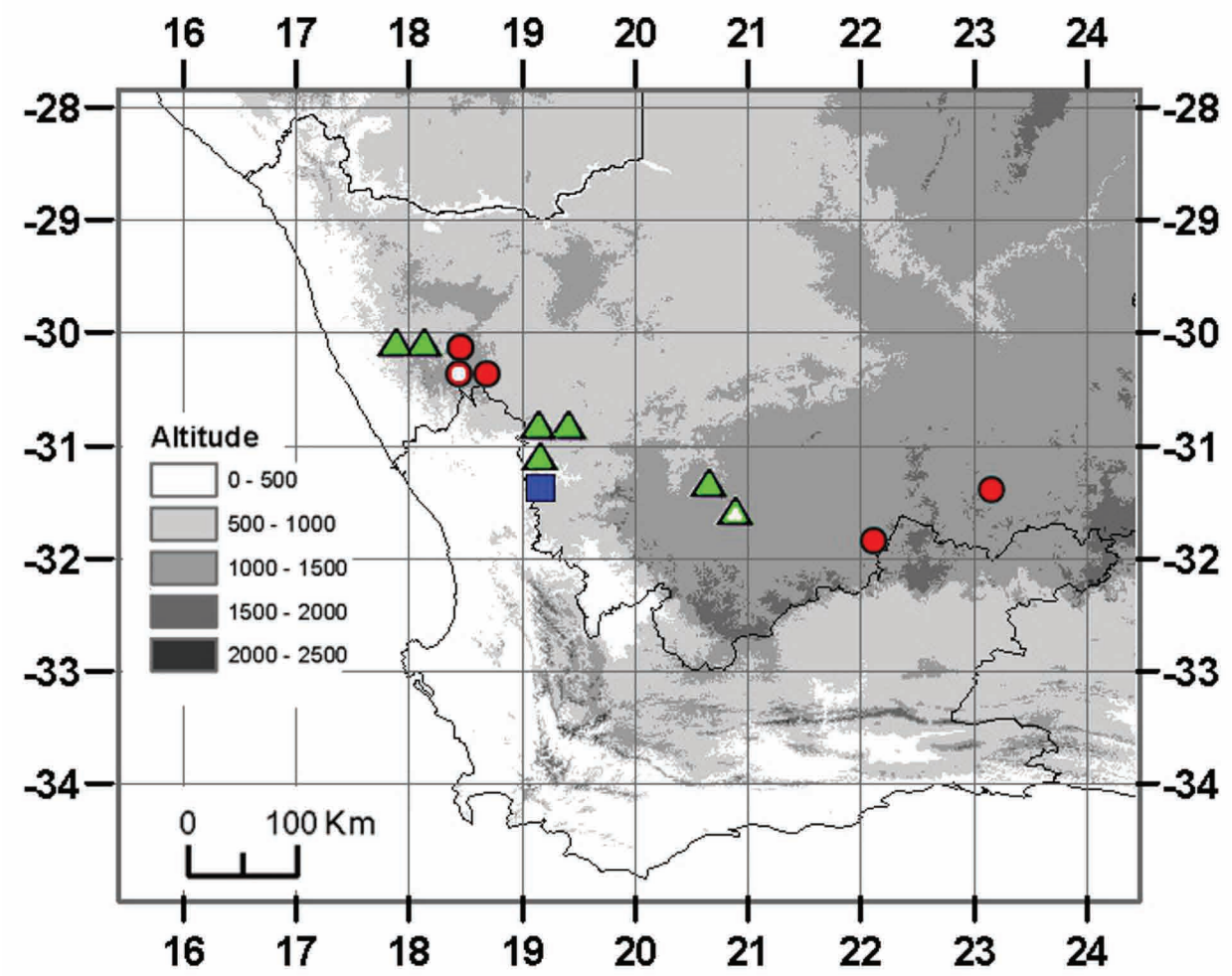

FIGURE 7. Known distribution of *Massonia bakeriana* M.Pinter, Mart.-Azorín & Wetschnig. (green triangles), *Massonia echinata* L.f. (blue squares) and *Massonia mimetica* Mart.-Azorín, M.Pinter, M.B.Crespo & Wetschnig (red circles) in the Northern Cape Province of South Africa. Type localities are indicated by symbols with white centres.

Acknowledgements

This work was partly supported by Fundación Ramón Areces (Spain), University of Alicante (Spain) and Karl-Franzens-University (Austria). Rhodes University (Dept. of Botany) and the Selmar Schonland Herbarium (GRA) also provided working facilities to the second author between 2009 and 2011. We thank D. Bellstedt and L. Mucina for their invaluable help on our field trip in 2009. We also thank E. Stabentheiner and A. Brudermann for providing the SEM micrographs. Photographs of some seeds were kindly provided by K. Achner and V. Zengerer. We acknowledge the help of all herbaria curators who kindly provided material and information. We thank P. Cumbleton for showing us the Hyacinthaceae collection at RHS Garden Wisley and for providing seeds and a bulb of the new species. J.C. Manning is thanked for allowing us to study the *Massonia* materials on loan at NBG. We also would like to thank all the numerous garden and plant enthusiasts who publish valuable information and images on plants on the internet and who contribute substantially to the increase of knowledge. The provincial nature conservation authorities of Western Cape and Northern Cape Provinces kindly granted plant collecting permits. (FLORA046/2010, FLORA047/2010, FLORA069/2011, FLORA070/2011 and AAA008-00031-0028).

References

Baker, J.G. (1897) Liliaceae. *In*: Thiselton-Dyer, W.T. (Ed.) *Flora Capensis* 6. Reeve & Co., London, pp. 253−525.

Houttuyn, M. (1780) *Natuurlijke Historie of uitvoerige Beschryving der Dieren, Planten en Mineraalen, volgens het Samenstel van der Heer Linnaeus* II, 12, Amsterdam, 558 pp.

IPNI (2015) *The International Plant Names Index*. Available from: http://www.ipni.org (accessed 7 August 2015)

Jacquin, N.J. (1791) *Collectanea ad Botanicam, Chemiam, et Historiam Naturalem, Spectantia, cum Figuris* 4. Wappler, C.F., Vindobonae, 359 pp.

Linnaeus, C. filius (1782) *Supplementum plantarum Systematis vegetabilium editionis decimae tertiae, Generum plantarum editionis sextae, et Specierum plantarum editionis secunda*. Braunschweig, 468 pp.

Leistner, O.A. & Morris, J.W. (1976) Southern African place names. *Annals of the Cape Provincial Museum* 12: 1−565.

Martínez-Azorín, M., Crespo, M.B. & Juan, A. (2007) Taxonomic revision of *Ornithogalum* subg. *Cathissa* (Salisb.) Baker (Hyacinthaceae). *Anales del Jardín Botánico de Madrid* 64: 7−25.
http://dx.doi.org/10.3989/ajbm.2007.v64.i1.47

Martínez-Azorín, M., Crespo, M.B. & Juan, A. (2009): Taxonomic revision of *Ornithogalum* subg. *Beryllis* (Hyacinthaceae) in the Iberian Peninsula and the Balearic Islands. *Belgian Journal of Botany* 142: 140−162.

Martínez-Azorín, M., Pinter, M., Crespo, M.B., Pfosser, M. & Wetschnig, W. (2013) *Massonia mimetica* (Hyacinthaceae, Hyacinthoideae), a new remarkable species from South Africa. *Stapfia* 99: 187–197.

Martínez-Azorín, M., Clark, V.R., Pinter, M., Dold, A.P., Crespo, M.B., Barker, N.P., Pfosser, M. & Wetschnig, W. (2014a) *Massonia dentata* (Asparagaceae, Scilloideae), a new species from the Nuweveldberge, and typification of the Sneeuberg endemic *M. calvata* (southern Great Escarpment, South Africa). *Phytotaxa* 175 (4): 201–215.
http://dx.doi.org/10.11646/phytotaxa.175.4.2

Martínez-Azorín, M., Pinter, M., Deutsch, G., Brudermann, A., Dold, A.P., Crespo, M.B., Pfosser, M. & Wetschnig, W. (2014b) *Massonia amoena* (Asparagaceae, Scilloideae), a striking new species from the Eastern Cape, South Africa. *Phytotaxa* 181 (3): 121–137.
http://dx.doi.org/10.11646/phytotaxa.181.3.1

Martínez-Azorín, M., Dold, A.P., Pinter, M., Slade, J.M., Crespo, M.B., Milkuhn, G. & Wetschnig, W. (2015) *Massonia obermeyerae* (Asparagaceae, Scilloideae), a new species from South Africa. *Phytotaxa* 205 (1): 39–50.
http://dx.doi.org/10.11646/phytotaxa.205.1.3

Mucina, L. & Rutherford, M.C. (Eds.) (2006) *The vegetation of South Africa, Lesotho and Swaziland.* South African National Biodiversity Institute, Pretoria, 807 pp.

Müller-Doblies, U. & Müller-Doblies, D. (1997) A partial revision of the tribe Massonieae (Hyacinthaceae). *Feddes Repertorium* 108: 49−96.
http://dx.doi.org/10.1002/fedr.19971080106

Pinter, M., Brudermann, A., Crespo, M.B., Deutsch, G., Martínez-Azorín, M., Müller-Doblies, U., Müller-Doblies, D., Pfosser, M. & Wetschnig, W. (2013) *Massonia citrina* (Hyacinthaceae, Hyacinthoideae) - a new species from the Western Cape Province (South Africa). *Phytotaxa* 112 (2): 50–56.
http://dx.doi.org/10.11646/phytotaxa.112.2.3

Speta, F. (1998a) Hyacinthaceae. *In*: Kubitzki, K. (Ed.) *The families and genera of vascular plants* 3. Springer, Berlin, pp. 261−285.

http://dx.doi.org/10.1007/978-3-662-03533-7_35

Speta, F. (1998b) Systematische Analyse der Gattung *Scilla* L. s.l. (Hyacinthaceae). *Phyton (Horn)* 38: 1–141.

Summerfield, A. (2004) A Synopsis of the Biosystematic Study of the seven minor genera of the Hyacinthaceae. *Bulbs Bulletin of the International Bulb Society* 6: 24–36.

Thiers, B. (2015) *Index Herbariorum: A global directory of public herbaria and associated staff.* New York Botanical Garden's Virtual Herbarium. Available from: http://sweetgum.nybg.org/ih/ (accessed 7 August 2015)

Wetschnig, W., Brudermann, A., Knirsch, W., Pinter, M. & Pfosser, M. (2012) *Massonia pustulata* Jacq. 1791 and *M. longipes* Baker 1897 (Hyacinthaceae), two frequently misunderstood species - or how *M. pustulata* became depressed. *Stapfia* 97: 210−221.

Wetschnig, W., Martínez-Azorín, M., Pinter, M., Brudermann, A., Deutsch, G., Crespo, M.B., Dold, A.P. & Pfosser, M. (2014) *Massonia saniensis* (Asparagaceae, Scilloideae), a new species from Lesotho, southern Africa. *Phytotaxa* 173 (3): 181–195. http://dx.doi.org/10.11646/phytotaxa.173.3.1

APPENDIX 1. Specimens examined of *Massonia echinata* and *M. mimetica*.

Massonia echinata:—SOUTH AFRICA. Northern Cape. Calvinia (3119): ca. 9 km W of Nieuwoudtville, Vanrhyns Pass Lookout (-AC), 806 m elevation, 22 September 2009 in fruit, *WW03970* (GZU!), *WW03971* (GZU!), *WW03972* (GZU!); Kamiesberg (3018): Hantam Botanical Garden (-AC), ca. 737 m elevation, 23 September 2009; in fruit, *WW03974* (GZU!), *WW03975* (GZU!).

Massonia mimetica:—SOUTH AFRICA. Northern Cape. Kamiesberg (3018): S of Gamoep, Kamiebees (-AB), 940 m elevation (photo!); Kamiesberg (3018): ca. 40 km east of Leliefontein, near Platbakkies settlement (-AD), 1059 m elevation, deep red sandy soil, 29 August 2011 in fruit, *M. Martínez-Azorín, A. Martínez-Soler & R. McKenzie MMA732* (GRA!, ABH!, GZU!, K!); *ibidem*, 26 July 2013 in fruit, *W. Wetschnig* (GZU photo!); Kamiesberg (3018): Farm Bounste Vlei, Kliprand (-BC), Bushmanland in red sand, full sun, *D.S. Hardy 114* (PRE0050997-0!); Loxton (3122): ca. 70 km NNW of Beaufort West, SW of Loxton, Sakrivierspoort farm (-CC), adjacent to the Sak River, edge of riparian vegetation, base koppie on floodplain, 1339 m elevation, 14 May 2013 in flower, *B. Schumann* (iSpot photo!, http://www.ispotnature.org/node/524777#comment-99442); Victoria West (3123): Victoria West, near Golf Course (-AC), *F. Avenant* (photo!).