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Three cryptic new species of *Aristea* (Iridaceae) from southern Africa

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ABSTRACT

Field work in southern Africa over the past several years has resulted in the discovery of three new species of the sub-Saharan African and Madagascan genus *Aristea* Aiton, which now comprises some 53 species. *Aristea* has a pronounced centre in southern Africa and a centre of diversity in the winter rainfall zone of the subcontinent, where all three new species occur, one extending eastward into the adjacent southern edge of the summer rainfall zone. All three novelties have been collected in the past but were confused with related species. *A.* **elliptica** (subgenus *Eucapsulares*), confused in the past with *A. pusilla* (Thunb.) Ker Gawl., has a more robust habit, usually with 4 or 5 flower clusters per flowering stem, pale blue flowers, smooth ellipsoid seeds with flattened surface cells, and pollen shed as monads, whereas *A. pusilla* usually has 1–3 flower clusters per flowering stem, dark blue flowers, pollen shed as tetrads, and globose seeds with faint foveate sculpturing and colliculate surface cells. *A.* **nana** (also subgenus *Eucapsulares*), known from few collections, and also confused with *A. pusilla* or *A. anceps* Eckl. ex Klatt, has the unbranched and leafless flowering stem of the latter but has large green floral spathes, flowers borne on long pedicels, and lacks a leaf subtending the single terminal flower cluster in contrast to nearly sessile flowers in *A. pusilla* and *A. anceps*, and in the latter, dry, rusty spathes. *A.* **cistiflora** (subgenus *Pseudaristea*) closely resembles *A. teretifolia* Goldblatt & J.C.Manning but has linear to narrowly sword-shaped leaves and ± secund flowers with the outer tepals only slightly smaller than the inner and with small, dark brown markings at the bases of all the tepals. In contrast, *A. teretifolia* has narrower, sometimes terete leaves and flowers held upright with the outer tepals noticeably smaller than the inner and bearing dark markings covering the lower half, whereas the inner tepals are unmarked.

INTRODUCTION

In the course of field work in southern Africa, three undescribed species of the sub-Saharan African and Madagascan genus *Aristea* Aiton have come to light. All are spring-flowering species native to the eastern half of the southern African winter rainfall zone and adjacent southern edge of the summer rainfall zone. All have been collected before but have been confused with known species similar in vegetative or floral morphology. Comparison of the taxonomically critical features of the genus, including seeds and pollen grains (Goldblatt & Le Thomas 1997; Goldblatt *et al.* 2004), has substantially aided in distinguishing two of them, *A. elliptica* and *A. nana*, both members of subgenus *Eucapsulares*: section *Eucapsulares* (taxonomy following Goldblatt & Le Thomas 1997). In contrast, details of the flower have shown that *A. cistiflora*, of subgenus *Pseudaristea*, differs from the closely related *A. teretifolia* Goldblatt & J.C.Manning, although its other vegetative and fruiting features accord closely with the remaining members of the subgenus (Goldblatt & Manning 1997a). All species have been examined live in the field as well as in the herbarium. With the addition of these three novelties, *Aristea* comprises an estimated 53 species. Seven species occur in Madagascar (Goldblatt 1991, 1995a) and about 18 in tropical and eastern southern Africa (Weimarck 1940; Vincent 1985), one shared with Madagascar. There are 33 species in the southern African winter rainfall zone (Goldblatt & Le Thomas 1997; Goldblatt & Manning 1997a, b), four of which are shared with eastern southern Africa.

In the descriptions that follow, we ignore the homologies of the subtending foliar bracts of the inflorescence, a binate rhipidium, and call the outer two bract members spathes and those enclosed within them bracts, the latter always smaller than the spathes. The individual inflorescence units, which vary in number and arrangement on the flowering stem, are simply termed flower clusters.

Subgenus *Eucapsulares* section *Eucapsulares*

Aristea nana *Goldblatt & J.C.Manning*, sp. nov.

Plantae (50–)80–150 mm altae, caule complanato bialato 1.2–2.2 mm lato, nodo terminale elongato, foliis anguste ensiformibus vel linearibus caule pauciter excedentibus, 1.5–4.0 mm latis, marginibus hyalinis saepe rubrescentibus, rhipidio binato unico terminale (1)2-florum, spathis inaequalibus viridibus marginibus siccis hyalinis (13–)15–25 mm longis, bracteis similaribus 6–12 mm longis spathis obtectis, floribus atrocaeruleis ,tepalis inaequalibus, externis ± 10–16 × 3.5–5.0 mm, internis 12–17 × 5.5–11.0 mm, filamentis 3–4 mm longis, antheris ± 2.5 mm longis flavis, ovario ovoideo 4–6 mm longo, pedicelis 10–12 mm longis, stylo 3-lobato 5–6 mm longis, capsulis ovoideis (6–)10–18 mm longis, seminibusque ignotis.

TYPE.—Eastern Cape, 3323 (Willowmore): hill slopes immediately north of Joubertina (growing with *A. pusilla*), (–DD), 19 Sept. 2004, *P Goldblatt & L.J. Porter 12492* (NBG, holo.; K, MO, PRE, iso.).

Plants (50–)80–150 mm high, sometimes in small tufts; stem flattened and 2-winged, 1.2–2.2 mm wide, one or

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two per plant, with elongate terminal internode up to 90 mm long, occasionally with second short stem up to 30 mm long, stems each with single terminal flower cluster. *Leaves* narrowly sword-shaped to linear, sometimes shortly exceeding stem, 1.5–4.0 mm wide, with narrow translucent margins sometimes flushed red. *Flower clusters* solitary, terminal, (1)2-flowered; spathes unequal, green, acute-attenuate, margins dry and hyaline, (13–)15–25 mm long; bracts similar, 6–12 mm long, enclosed within spathes. *Flowers* on pedicels 10–20 mm long, dark blue, outer tepals green on outside; tepals unequal, outer ± 10–16 × 3.5–5.0 mm, inner 12–17 × 5.5–11.0 mm. *Stamen filaments* 3–4 mm long; anthers ± 2.5 mm long, yellow; pollen grains shed singly. *Ovary* ovoid, ± 4–6 mm long; style 5–6 mm long, 3-lobed at apex, ± 6 mm diam., lobes lightly fringed. *Capsules* ovoid, (6–)10–18 mm long, on pedicels up to 20 mm long. *Seeds* unknown. *Flowering time:* late July to September, rarely in early October.

Distribution and ecology: occurring in Western and Eastern Cape, from Robinson's Pass to the Baviaanskloof, on sandy and rocky sandstone slopes, in arid, marginal fynbos.

A dwarf species, mostly reaching less than 120 mm in stature, *Aristea nana* has until recently rarely been collected and then has usually been confused with similarly low-growing *A. pusilla* (Thunb.) Ker Gawl. When we came across the species in the wild in 2003, growing together with *A. pusilla* near Joubertina, in Eastern Cape, on a slope burned the previous summer, direct comparison of the two in full bloom made it clear that these were different species, despite their similar dwarf growth form and virtually identical flowers. They differ slightly in their leaves, those of *A. nana* having a glaucous bloom and wider translucent margins, whereas the pale green leaves of *A. pusilla* are softer textured. The flowering stem of *A. nana* is almost always unbranched and bears leaves only near the base. The terminal internode is several times longer than the rest of the stem and terminates in a single inflorescence of two or rarely three flowers. Particularly striking are the well-developed pedicels of the flowers, 10–12 mm long, and ovoid ovary, 4–6 mm long, quite different to the short pedicels, ± 2 mm long, of *A. pusilla* and triangular-columnar ovary, 12 mm long.

Subsequent examination of the pollen of the two species from the Joubertina site showed that *Aristea pusilla* has pollen shed in tetrads, the monads with operculate apertures, as described by Goldblatt & Le Thomas (1997). Pollen of *A. nana*, however, is shed singly, and the grains are dizonasulculate, having two smooth, well-defined apertures at opposite ends of the grain. Once we had determined that *A. nana* was a distinct species, we made a concerted effort in 2004 to establish its range. We found it to be common in the Long Kloof and valleys to the north from Avontuur to Joubertina. We were also able to identify additional collections of *A. nana* in herbaria, where the earliest collections that we have found are those made by R.D. Bayliss in 1974 and mixed with *A. pusilla*. Later collections in herbaria have consistently been misidentified as *A. pusilla*.

Despite their superficial similarity, *Aristea nana* and *A. pusilla* are probably not closely related. Instead, we believe that *A. nana* is most closely allied to the eastern southern African *A. abyssinica* Pax (currently including *A. cognata* N.E.Br. (Goldblatt 1995b) and *A. anceps* Eckl. ex Klatt. These two species also have unbranched, flattened and broadly winged flowering stems with an extended upper internode, thus bearing leaves only near the base (Weimarck 1940). In addition, *A. nana*, *A. abyssinica*, and *A. anceps* sometimes produce a short stem held close to the base of the plant as well as normal extended flowering stems, a feature not before reported. Some examples are collections of *A. abyssinica* from KwaZulu-Natal (*Goldblatt & Manning 9720*, MO) and Limpopo in South Africa (*Goldblatt & Porter 11954B*, MO) and Zimbabwe (*Chase 3650*, MO) and *A. anceps* (*Barker 6991*, NBG; *Compton 20288*, NBG).

Unlike *Aristea nana*, however, both *A. abyssinica* and *A. anceps* have a small subterminal leaf subtending the terminal flower cluster or terminal pair of flower clusters, and rarely a second subterminal leaf 10–20 mm below the flower clusters. *A. anceps* also differs in having the inflorescence spathes and bracts ± dry at flowering time, whereas those of *A. nana* are green. Spathes and bracts of *A. abyssinica* are green with broad dry margins at flowering time, later becoming entirely membranous. They also have subsessile flowers (pedicels are 2–3 mm long in *A. anceps*), whereas those of *A. nana* have pedicels up to 20 mm long at flowering time, extending to 15 mm in fruit. Moreover, both *A. abyssinica* and *A. anceps* have pollen grains with the apertures obscured by masses of exine (Goldblatt & Le Thomas 1997). The grains were thus termed sulculate; subsequent examination using transmission electron microscopy showed that the apertures are either zonasulculate or disulculate, in either case with a thick intine indicating the location of the aperture (Goldblatt *et al.* 2004). Pollen grains of *A. nana* differ significantly from those of its apparent relatives in having smooth apertures, unique for a species of section *Eucapsulares*. Whereas nearly mature capsules of *A. nana* are known, mature seeds are not, making impossible comparison of the latter character, important in determining relationships in *Aristea* (Goldblatt *et al.* 2004).

Additional material examined

EASTERN CAPE.—3322 (Oudtshoorn): sandstone slopes at top of Nuwekloof Pass, near Farm Vaalwater, (–BC), 23 September 2004, *Goldblatt & Porter 12545* (MO, NBG, PRE); Kouga Mtns, Farm Hoeree, ± 700 m, (–DB), 29 September 1986, *Oelofsen 105* (PRE); 6.7 km E of Joubertina, sandy gravel slopes [growing with *A. pusilla*], (–DD), 24 September 2003, *Goldblatt & Porter 12361* (MO, NBG). 3324 (Steytlerville) Kouga Mtns, near Doringkloof, ± 900 m, (–CA), 30 July 1978, *Bond 1421* (PRE). [Doubtful locality] 3326 (Grahamstown): Bathurst Dist., grassland (mixed collection, with *A. pusilla*), (–DB), 1 August 1974, *Bayliss 6255* (MO).

WESTERN CAPE.—3321 (Ladismith) Gamka Mountain Reserve, Zebra ridge near Oukraal, stony sandstone soil, (–CB), 15 August 1983, *Cattell 286* (NBG). 3322 (Oudtshoorn): Robinson's Pass, N-facing slopes in stony ground, (–CC), 22 September 2000, *Goldblatt & Nänni 11583* (MO, NBG); Perdepoort N of Camfer, sandstone slopes burned last summer, (–CD), 29 September 2004, *Goldblatt & Porter 12572* (MO, NBG); upper Longkloof, rocky sandstone bank burned last summer, (–DD), 18 September 2004, *Goldblatt & Porter 12486* (MO, NBG, PRE). 3323 (Willowmore): Antoniesberg, north slopes, (–AD), 30 September 1989, *Barker 679* (PRE); W end of the Kouga Mtns, Bo-Kouga road, ± 5 km from Uniondale, (–CA), 24 September 2003 (fruiting), *Goldblatt & Porter 12369* (MO).

Aristea elliptica *Goldblatt & A.P.Dold*, sp. nov.

Plantae 200–350(–500) mm altae, caule ovoideo leviter bialato 2.5–3.0 mm lato eramoso (2)3 vel 4 inflorescentibus sessilibus ferentibus (raro infima breviter stipitato), foliis linearibus ad ensiformibus usitate (2.5–) 4.0–6.0 mm latis coriaceis glaucis marginibus anguste hyalinis, rhipidio binato 3–5 terminale 2-florum lateralibus usitate 1- vel 2-florum, spathis viridibus marginibus siccis brunneis (25–)30–38 mm longis, bracteis siccis brunneis quam spathis brevibus, floribus pallide caeruleis, tepalis externis 16–18 × ± 7 mm, internis ± 16 × ± 9 mm, filamentis ± 3 mm longis, antheris ± 3 mm longis flavis, ovario triangulo-columnari 12–16 mm longo, pedicelis ad 3 mm longis, stylo ± 6.5 mm longo ad apicem 3-lobato fimbriatoque, capsulis triangulo-cylindricis (20–)24–30 mm longis, seminibus ellipsoideis, in capsulo obliquis.

TYPE.—Eastern Cape, 3326 (Grahamstown): Kariega Park, between Kenton-on-Sea and Salem, stony quartzitic outcrops, (–DA), 21 August 2003, *A.P. Dold 4604* (GRA, holo.; MO, NBG, iso.).

Plants 200–350(–500) cm high; stem oval in section and prominently 2-winged, 2.5–3.0 mm wide, normally unbranched, with (2)3 or 4 lateral flower clusters, these sessile or lowermost short-stalked. *Leaves* clustered at base, with 2 cauline leaves, linear to narrowly sword-shaped, (2.5–)4.0–6.0 mm wide, firm to leathery, glaucous, with narrow hyaline margins. *Flower clusters* 3–5, terminal cluster 2-flowered, lateral clusters 1- or 2-flowered; spathes green with membranous, hyaline or brown margins, (25–)30–38 mm long; bracts green to dry, one-third as long as spathes and concealed by them. *Flowers* pale blue, outer tepals with broad green stripe on reverse; tepals unequal, outer 16–18 × ± 7 mm, inner ± 16 × ± 9 mm. *Stamen filaments* ± 3 mm long; anthers ± 3 mm long, smaller after dehiscing; pollen grains shed singly. *Ovary* triangular-columnar, 12–16 mm long, on pedicels up to 3 mm long; style 3-lobed and fringed, ± 6.5 mm long. *Capsules* cylindric and three-lobed, (20–)24–30 mm long; lobes angled. *Seeds* ellipsoid, many per locule, often oriented obliquely to capsule axis in single row, smooth, surface cells ± plane to weakly domed. *Flowering time:* August to October. Figure 1.

Distribution and ecology: occurring in Eastern Cape, from the Zuurberg Mountains as far east as the Fish River Mouth, mainly on sandstone slopes and often on rock outcrops, in fynbos or grassy fynbos.

FIGURE 1.—*Aristea elliptica*. A, flower; B, fruit. Photographed from *Dold 4604*.

Aristea elliptica most closely resembles the diminutive southern Cape species, *A. pusilla*, and was included in what Weimarck (1940) called *A. pusilla* subsp. *robustior* Weim. That taxon is based on a painting of a dark blue-flowered plant called *A. pusilla* in *Curtis's Botanical Magazine* (Ker Gawler 1809). In the absence of an associated specimen, however, it is impossible to establish its identity with confidence. We believe it represents a well-grown specimen of *A. pusilla* but is not distinct from that species, which has the dark blue flowers clearly evident in the painting. However, some collections from Eastern Cape referred to subsp. *robustior* by Weimarck (1940) and later by Vincent (1985), appear very different and, as Weimarck noted, it is difficult to accept these as belonging to the same species. Weimarck's decision to treat the two as subspecies was largely based on the presence of apparent intermediates, which he did not enumerate, in the Uitenhage and Port Elizabeth areas. Vincent (1985) who also recognized *A. pusilla* subsp. *robustior* does list intermediates but some of these specimens are subsp. *pusilla* and others are *A. spiralis* (L.f.) Ker Gawl. (*Marsh 660*, PRE, from Franschhoek Pass) or *A.* aff. *pauciflora* Wolley Dod (*Oliver 5472*, PRE, NBG, from Bailey's Peak, Klein Swartberg Mtns), both of which localities are outside the range of both *A. elliptica* and *A. pusilla*. Measurements

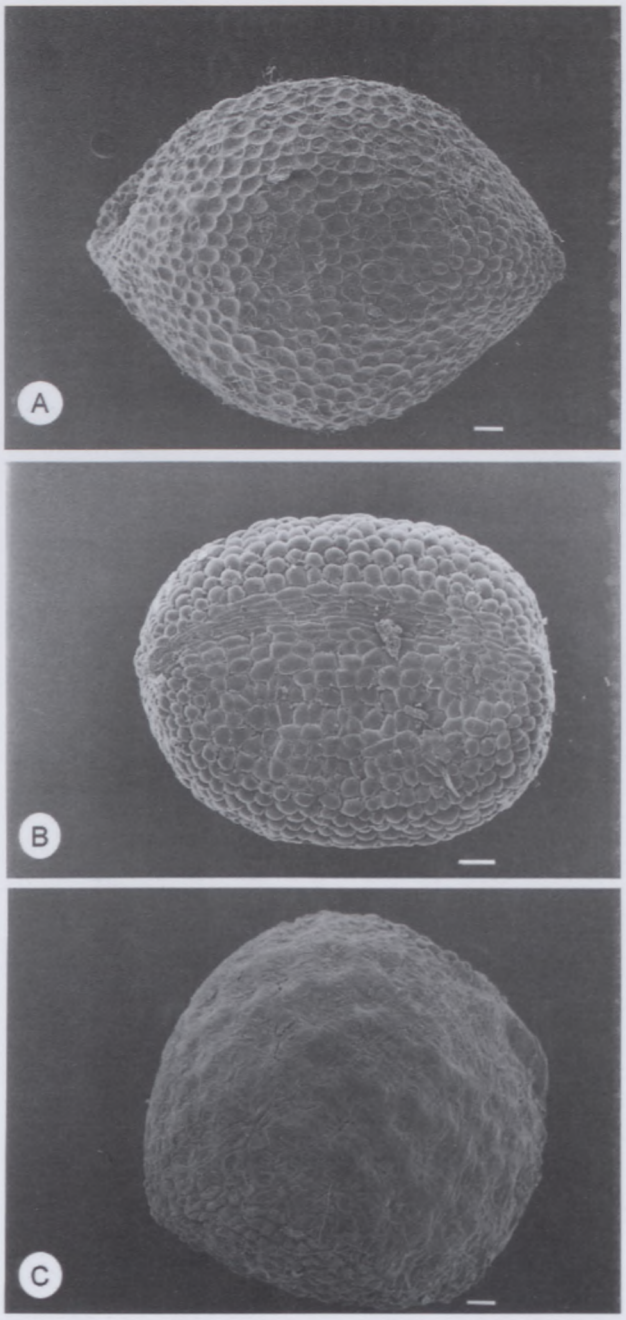

FIGURE 2.—SEM micrographs of seeds. *Aristea elliptica*: A, non-raphal view, *Dold 4604*; B, with raphe across upper third, *Dold 4618*; C, SEM micrograph of seed of *Aristea ensifolia*, *Goldblatt & Porter 12353*. Scale bars: 100 µm.

given by Vincent for subsp. *robustior* mostly do not apply to *A. elliptica*.

While most of these so-called intermediates are merely more robust *Aristea pusilla*, the taller Eastern Cape plants referred to *A. pusilla* subsp. *robustior* represent a second species, recognized at first by its larger size and associated broader stem and leaves, the latter firmer and more leathery than those of *A. pusilla*. More careful examination of these plants shows that they have ellipsoid seeds, unique in *Aristea*, with a smooth surface and surface cell outlines plane or weakly colliculate (Figure 2A, B). The seeds lie in a single row in each locule, as they do in the closely related *A. ecklonii* Baker, *A. ensifolia* Muir and *A. pusilla*, but unlike the horizontally packed seeds in these three species, those of *A. elliptica* are loosely arranged and often oriented obliquely to the long axis of the capsule in a zig-zag arrangement with only their tips touching (Figure 1B). In this arrangement every alternate seed is more or less parallel. These plants also have pollen grains shed singly (Table 1) and they are bisulculate, with two large apertures covered with exine.

Both the seeds and pollen contrast starkly with those of *Aristea pusilla* and its ally *A. ensifolia*. Seeds of these species are depressed-globose to shortly columnar (Figure 2C) (flattened dorsally and ventrally due to pressure from adjacent seeds) with shallow foveate sculpturing and surface cell outlines colliculate to tuberculate (Goldblatt *et al.* 2004). The seeds are vertically stacked, in capsules similar to those of *A. elliptica* but (14–) 20–25(–30) mm long. Pollen of *A. pusilla* is shed in tetrads (Goldblatt & Le Thomas 1997) and the monads are operculate. We have now sampled six populations of *A. pusilla* from across its entire range and confirm tetrads in all of them (Table 1), whereas four populations of *A. elliptica* examined for the feature have disulculate pollen grains shed singly. The latter pollen type conforms to the pattern in most members of section *Eucapsulares* (Goldblatt & Le Thomas 1997; Goldblatt *et al.* 2004).

Typical *Aristea pusilla* is a dwarf plant, usually 80–150 mm high, with fairly soft-textured, pale green leaves mostly 2–4 mm wide, and flowers slightly smaller than those of *A. elliptica*, with outer tepals 12–14 × 7 mm, and inner 9–11 × ± 9 mm versus outer tepals 16–18 × ± 7 mm, and inner ± 16 × ± 9 mm in *A. elliptica*. While *A. pusilla* occurs on both loamy clay and sandy slopes

TABLE 1.—Pollen types in populations of *Aristea pusilla* and *A. elliptica*; all localities are in South Africa. Vouchers are housed at GRA, MO, and NBG

Species	Voucher data	Pollen grains
A. pusilla	W. Cape, Swellendam, *Goldblatt & Manning 12256A* (MO)	tetrads, monads operculate
	W. Cape, Prince Alfred's Pass, *Goldblatt & Porter 12279* (MO)	tetrads, monads operculate
	E. Cape, Joubertina, *Goldblatt & Porter 12364* (MO, NBG)	tetrads, monads operculate
	E. Cape, Grahamstown, *Bayliss 7635* (MO)	tetrads, monads operculate
	E. Cape, Stones Hill, Grahamstown, *Rennie 170* (GRA)	tetrads, monads operculate
	E. Cape, Grahamstown, *Van Dam s.n.* (PRE)	tetrads, monads operculate
A. elliptica	E. Cape, Kariega Park, *Burrows 4658* (GRA)	disulculate with apertural exine
	E. Cape, Kariega Park, *Dold 4604* (GRA)	disulculate with apertural exine
	E. Cape, Kowie Nature Reserve, *Dold & Cocks 4607* (GRA)	disulculate with apertural exine
	E. Cape, Port Alfred, *Tyson 150* (PRE)	sulculate* with apertural exine

* Pollen grains from *Tyson 150*, are described as sulculate because we cannot detect the aperture(s) beneath the exine that covers the entire surface.

and extends from Swellendam in the west along the coast and in the Long Kloof to Grahamstown in the east, *A. elliptica* favours rocky sandstone slopes, often occurring in quartzite outcrops and is known from the Zuurberg at Grahamstown and eastward to the Fish River Mouth. The ranges of the two species overlap in the Grahamstown area. Any confusion between the two is most likely the result of depauperate specimens of *A. elliptica* being mistaken for robust plants of *A. pusilla*. Apart from the pollen and seed differences, *A. elliptica* can be separated by the leaves, mostly 4–5 mm wide, leathery and somewhat glaucous, the flowering stem usually bearing at least four flower clusters, the lowermost sometimes short-stalked, and the inflorescence spathes (25–)30–38 mm long. Capsules of *A. elliptica* are elongate, (20–)24–30 mm long, and contain ellipsoid seeds in a single vertical row, with the long axis of the smooth seeds oblique to the long axis of the locules as explained above. The spathes of *A. pusilla* are 16–20 mm long and the stem 1.5–2.0 mm wide.

Additional material examined

EASTERN CAPE.—3326 (Grahamstown): Grahamstown, Stones Hill, (–BC), 18 October 1931, *J.R. & B.Rennie 179* (GRA); Beggars Bush State Forest, quartz outcrop in grassy fynbos overlooking Beggars Bush Farm, 25 January 2004 (fr.), *Dold 4625* (GRA); stony sandstone-derived soil on slopes W of Fish River Mouth near Sherwood turnoff, 20 January 1993 (fruiting), *Goldblatt & Manning 9530A* (MO); Kariega Park, 16 km N of Kenton on Sea, (–DA), 14 August 1997, *H.H. Burrows 4658* (GRA), 17 September 1994, *H.H. Burrows 4113A* (GRA); Port Alfred, grassy slopes, (–DB), Oct. 1916, *Tyson 150* (PRE); Kowie Nature Reserve, Port Alfred, (–DB), 26 October 2003 (fr.), *Dold & Cocks 4607* (GRA, MO).

Subgenus *Pseudaristea*

Aristea cistiflora *J.C.Manning & Goldblatt*, sp. nov.

Plantae (100–)300–500 mm altae caespitose, caule eramoso raro breviter 1–2 ramoso ovale, foliis linearibus usitate 2.5–3.0 mm latis leviter rotatis, rhipidio binato (1–)4–6 usitate sessilibus 2–4 florum, spathis virides marginibus translucentibus supra siccentibus 15–18 mm longis, bracteis similibus pauce brevibus, floribus pallide roseis ad pallide lilaceis vel cremeis, tepalis externis 22–23 × 13–14 mm, internis 23–25 × 15–17 mm cupreo-brunneis in tertiis proximalibus, filamentis ± 4 mm longis, antheris 5–6 mm longis flavis, ovario oblongo ± 10 mm longo, stylo ± 11 mm longo ad apicem late 3-lobato fimbriato, capsulis elongato lignosis indehiscentibus 35–40 mm longis, seminibus triangulato-columnaribus fimbriato-papillosis ad angulibus.

TYPE.—Western Cape, 3420 (Swellendam): Swellendam, Marloth Reserve, Reservoir Hill, (–AB), 22 August 2003, *J.C. Manning 2875* (NBG, holo.; MO, PRE, iso.).

Plants (100–)300–500 mm high, forming tufts up to 150 mm diam.; stem erect, occasionally with 1 or 2 short branches, oval in section. *Leaves* linear to narrowly sword-shaped, mostly 2.5–3.0 mm wide, reaching to middle of stem, loosely twisted. *Flower clusters* (1–)4–6, mostly sessile, each 2–4-flowered; spathes greenish with translucent margins becoming dry above, 15–18 mm long; bracts shorter than spathes. *Flowers* held at 45° to horizontal, large, pale pink to pale lilac or cream-coloured, with bases of tepals darker lilac, violet, or brown, streaked dull brown on outside, outer tepals copper-brown in lower third; tepals unequal, outer 22–23 × 13–14 mm, inner 23–25 × 15–17 mm. *Stamen filaments* ± 4 mm long; anthers 5–6 mm long, yellow; pollen grains shed singly. *Ovary* oblong, ± 10 mm long, weakly curved outward; style broadly 3-lobed and fringed, ± 11 mm long. *Capsules* elongate, woody, indehiscent, 35–40 mm long. *Seeds* triangular-columnar, 1.5–1.8 × ± 1.5 mm, reddish brown, flat at apex and base, fimbriate-papillate along angles, obscurely foveate on faces, surface cells domed. *Flowering time*: August to mid September. Figure 3.

Distribution and ecology: Western Cape, on the lower southern slopes of the Langeberg Mtns, in peaty sandstone soil, flowering only after fire or clearing of the veld.

FIGURE 3.—*Aristea cistiflora, Manning 2878*. A, basal leaves and flowering stem showing sessile lateral flower clusters and secund flowers, B, flower, front view; C, fresh capsule; D, dry capsule; E, seed. Scale bars: A–D, 10 mm; E, 1 mm. Artist: John Manning.

Evidently first collected by T.M. Wurts in 1952, and only a few times since then, we found *Aristea cistiflora* in 2003, in the spring after a wildfire on the Langeberg near Swellendam, when it became clear that it was an undescribed species. Although *Wurts 326* is stunted and only about 100 mm tall, the large, well-pressed flowers are identical to those of the type collection. Interestingly, in 1979 the South African botanist, Dr E.G.H. Oliver noted on the Wurts specimen, 'probably a new species, not described as material inadequate'. His prediction has proved correct.

Aristea cistiflora is apparently most closely related to *A. teretifolia* Goldblatt & J.C.Manning (Goldblatt & Manning 1997a), which also has unequal tepal whorls, with oblique outer tepals smaller than the inner and bearing dark basal marks. *Aristea teretifolia* is distinguished by its linear to terete leaves, up to 2 mm wide, flowering stems bearing at most two lateral inflorescences, and by the slightly smaller flowers with the the outer tepals ± 20 mm long and the inner 24–28 mm long, thus substantially longer than the outer, which are abruptly constricted at the base. In *A. cistiflora* the leaves are narrowly sword-shaped, mostly 2.5–3.0 mm wide, the flowering stems bear up to six lateral flower clusters and the inner tepals are only 1–2 mm longer than the outer, which taper gradually toward the base. *Aristea cistiflora* also has larger capsules than *A. teretifolia*, 35–40 mm long versus 20–30 mm long. In general appearance *A. cistiflora* is most likely to be confused with *A. cantharophila* Goldblatt & J.C.Manning but this species has subequal, symmetrical tepals with dark markings at the base of both whorls, dark filaments and exceedingly long capsules, 60–85 mm long.

As in other members of subgenus *Pseudaristea* (Goldblatt & Le Thomas 1997), the pollen grains of *Aristea cistiflora* are dizonasulculate and have reticulate exine and smooth apertures. Recognition of *A. cistiflora* brings the total number of species in subgenus *Pseudaristea* to eight.

Additional material examined

WESTERN CAPE.—3420 (Swellendam): Swellendam, base of Crown Mountain, clearing in pines, (–AB), 4 August 1952, *T.M. Wurts 285* (NBG); Swellendam; 9 September 1952, *T.M. Wurts 326* (NBG); Swellendam, Marloth Nature Reserve, old rather sparse veld near path on 'knol', 10 September 1969, *R.A. Haynes H202* (NBG).

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