

Notes on African plants

VARIOUS AUTHORS

IRIDACEAE

TWO NEW RENOSTERVELD SPECIES OF CROCOIDEAE FROM SOUTH AFRICA

INTRODUCTION

Southern Africa and the Cape Floral Region in particular is a major centre of diversity for Iridaceae. Approximately 70% of the species of Iridaceae recorded from southern Africa occur in the Cape Region and most are endemic to it (Goldblatt 1991; Goldblatt & Manning 2000). The family is especially well represented in the west and southwest of the region, which has a true summer-dry climate (Manning *et al.* in press). Local endemism is a common feature among the species in the region. Iridaceae display a high degree of substrate fidelity (Goldblatt & Manning 1996) and edaphic and topographic diversity appear to have played a significant role in speciation in the subcontinent (Goldblatt & Manning 1998). Although the great majority of species recorded from the Cape Floral Region are typically restricted to fynbos vegetation, the vegetation type known as renosterveld historically dominated much of the Cape lowlands. This fine-leaved shrubland occurs on nutrient-intermediate, fine-grained clays derived from shales of the Malmesbury and Bokkeveld Formations and is particularly rich in geophytic species. Now largely transformed by agriculture (Low & Rebelo 1996), renosterveld was commonly found along the coastal forelands as well as in inland drainage basins that are often isolated from one another. The drainage basin of the Breede River, which forms the region known as the Worcester Karoo, is rich in local endemics. Among these are *Ixia collina*, known only from near Aan de Doorns, southeast of Worcester, *I. vanzyliae*, distributed between Worcester and Roberston, and *Sparaxis maculosa*, restricted to the valley of the Hoeks River, a minor tributary of the Breede River, near Villiersdorp in the southwestern corner of the Worcester Karoo. Two additional local endemics restricted to the renosterveld in this area have since been discovered and are described here. It is becoming evident that the Worcester Karoo, known locally as the *Bosjesveld* at least since 1815 when the explorer William Burchell recorded the name (Burchell 1822), is a distinct enclave of endemism for Iridaceae and especially the genus *Ixia*. Fortunately extensive stretches of indigenous renosterbos shrubland still remain undisturbed in this area although it is slowly being removed to establish orchards and vineyards.

***Freesia fucata* J.C.Manning & Goldblatt, sp. nov.**

Plantae 150–300 mm altae, cormo conico 15–20 mm diam. tunicis pallide reticulatis, foliis 5–6 inclinatis vel suberectis linearibus 80–250 × 4–5 mm, caule usitate ramoso minute papillato, spica inclinata 4–9-florum, floribus (30–)35–47 mm longis fragrantibus albis

externe atropurpureis suffusis tepalis inferioribus aurantiacis notatis, tubo perianthii 20–30 mm longo infime filiforme 6–7 mm longo, tepalis inaequalibus, dorsale grandiore suberecto ovato 11–18 × 8–11 mm, inferioribus recurvatis, filamentis 13–15 mm longis, antheris 7–8 mm longis, stylo diviso prope apicem antherarum.

TYPE.—Western Cape, 3319, Villiersdorp Dist., 5.5 km along Doornrivier Road off Villiersdorp-Worcester Road, Farm Die Hoek, (–CD), 10-07-2000, Manning 2271 (NBG, holo.; MO, PRE, iso.).

Plants 150–300 mm high. *Corm* conic, 15–20 mm diam., tunics pale, medium-textured, reticulate, accumulating with age and forming neck around base of stem. *Leaves* 5 or 6, inclined to suberect, linear, tapering above, acute, 80–250 mm long, usually about as long as stem, 4–5 mm wide, cataphylls flushed deep purple. *Stem* minutely papillate, flexed outward above uppermost sheath and then suberect, usually with one or two branches. *Spike* lightly decumbent, 4–9-flowered; bracts soft, herbaceous, green with hyaline margins, tricuspidate, 6–10(–13) mm long; inner bracts slightly shorter, forked. *Flowers* (30–)35–47 mm long, strongly violet-scented, white flushed dull purple on reverse of tepals, base of lower tepals yellow-orange with dark midline; perianth tube 20–30 mm long with basal narrow part 6–7 mm long, widening rather abruptly into wider, flared upper portion; tepals unequal, the dorsal largest, suberect, ovate, 11–18 × 8–11 mm, upper laterals slightly narrower, oblong, lower tepals recurved, lower laterals narrowly ovate, 10–14 × 6–8 mm, lower median oblong, 10–16 × 5–6 mm. *Filaments* arcuate, inserted at base of widened upper portion, included, 13–15 mm long; anthers 7–8 mm long. *Style* dividing at or slightly beyond anther apices, branches deeply forked. *Capsule* oblong, three-lobed, (6–)9–12 × (6–)7–10 mm. *Seeds* globose with inflated chalaza and raphe, rugose, glossy reddish brown, 2.5–3.0 mm diam. *Flowering time*: July. Figure 1.

Distribution and biology: the species is known from several populations in the valley of the Hoeks River, in the southwestern corner of the Worcester Karoo, south of Villiersdorp (Figure 2). It occurs on clay soils derived from shales of the Bokkeveld series in open shrubland dominated by the renosterbos, *Elytropappus rhinocerotis*.

History: first collected at the type locality in 1975 by the Worcester dentist, I.B. Walters, who had a keen interest in the local flora and collected extensively in the Worcester Valley, this highly fragrant species is known only from this small area.



FIGURE 1.—*Freesia fucata*. A, whole plant; B, flowering spike; C, D, flower: C, front view; D, half flower. E, outer bract (left) and inner bract (right); F, capsules; G, seed. Scale bar: A–F, 10 mm; G, 1.5 mm. Artist: John Manning.

Diagnosis and relationships: *F. fucata* has the minutely papillate-puberulous stem, green bracts and narrowly ovate lower tepals characteristic of section *Viridibractea* (Goldblatt 1982). Within the section it is somewhat intermediate between *F. alba* (G.L.Mey.) Gumbleton and *F. caryophyllacea* (Burm.f.) N.E.Br. It has the narrow, erect leaves of the former and the bilabiate, white flowers flushed with purple of the latter. *F. fucata* is, however, unique in the genus in its distinctly tricuspidate outer bracts. *F. alba*, which is characterized by its almost actinomorphic perianth, is essentially a species of the southern Cape coastal forelands, occurring along forest margins or in open scrub in stony, sandstone-derived soils. *F. fucata* and *F. caryophyllacea*, in contrast, both occur in renosterbos shrubland on stony clay soils. The rather variable *F. caryophyllacea* typically has more or

less prostrate, usually rather broad, typically 10–16 mm wide, lanceolate and obtuse leaves. Populations in the west, centred around Caledon and Bredasdorp, however, have acute and often quite long leaves, 5–9 mm wide, but these are never as narrow or as long as in *F. fucata*. The Bredasdorp populations, which are found on limestone outcrops, were regarded by Goldblatt (1982) as a distinct species, *F. elimensis* L.Bolus, of possible hybrid origin between *F. alba* and *F. caryophyllacea*. Subsequent collections, however, suggest that it is no more than a local edaphic form of *F. caryophyllacea* (Goldblatt & Manning 2000). The possibility that *F. fucata* represents a hybrid between *F. alba* and *F. caryophyllacea* can be discounted since neither of the putative parents has the curious tricuspidate outer bracts of *F. fucata*, nor has either been collected in the immediate vicinity.

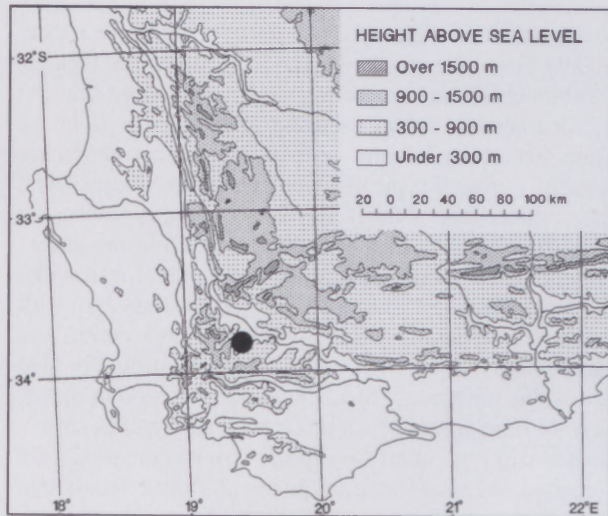


FIGURE 2.—Distribution of both *Freesia fucata* and *Ixia atrandra* in Western Cape.

The more common and widespread *F. refracta* (Jacq.) Klatt, which is well known from the Breede River Valley, also resembles *F. fucata* in its upright habit and narrow leaves and the first collection of the new species was assigned to it in error. *F. refracta* is easily identified, however, by its dry and membranous floral bracts and smaller flowers, 25–35(–40) mm long, with the dorsal tepal more prominent than the relatively small, cordate lower tepals that have their margins conspicuously curved upwards.

Additional material examined

WESTERN CAPE.—3319 (Worcester): near Die Hoek, Doornrivier, (–CD), 23-07-1975, Walters 157 (NBG).

Ixia atrandra Goldblatt & J.C.Manning, sp. nov.

Plantae 250–500 mm altae, cormo globoso tunicis reticulatis, foliis (3)4 lanceolatis basalibus 6–10 mm latis, caule simplice vel 1-ramoso, spica congestis (3)4–10-florum, bracteis scariosis translucetibus 5–6 mm longis, floribus carneis vel cremeis centro atrocolore hypocrateriformibus, tubo perianthii filiforme 6–9 mm longo, tepalis obovatis 11–14 × 6–8 mm, filamentis 2.5–3.0 mm longis ascendentibus, antheris oblongo-sagittatis 5–6 × 1.5–2.0 mm thecis latrorsibus nigris, pollinibus flavis, stylo diviso ad apicem tubi. Figure 3.

TYPE.—Western Cape, Villiersdorp Dist., about 5 km along Doornrivier Road off Villiersdorp-Worcester Road, Farm Die Hoek, (–CD), 3-10-2000, Goldblatt 11604 (NBG, holo.; K, MO, PRE, iso.).

Plants 250–500 mm high. *Corms* globose, 15–20 mm diam., tunics of medium-textured, wiry reticulate fibres. *Cataphylls* membranous, upper one reaching shortly above ground level and then flushed reddish purple. *Leaves* usually 4, sometimes 3, all basal, lanceolate, 6–10 mm wide, usually reaching to about middle of stem, uppermost leaf usually entirely sheathing, margins and midrib hyaline, lightly thickened, plane or lightly twisted in upper half. *Stem* erect, unbranched or with one



FIGURE 3.—*Ixia atrandra*. A, corm and leaves; B, flowering spike; C, anthers and style branches. Scale bar: A–C, 10 mm. Artist: John Manning.

ascending branch, 0.5–0.8 mm diam. below base of spike. *Spike* crowded, (3)4–10-flowered; bracts scarios, translucent, veins more or less pink above, outer 5–6 mm long, obscurely three-dentate, inner bract about as long as outer or slightly shorter, bicuspidate. *Flowers*

hypocrateriform, pink or rarely cream-coloured, lower third of tepals yellowish or pinkish ochre-coloured with an outer band of deep lilac, unscented; perianth tube filiform and clasping style for its entire length, 6–9 mm long, widened only in upper 1 mm; tepals obovate, somewhat narrowed into short claw below, spreading with distal margins curving upward, 11–14 × 6–8 mm. *Filaments* inserted at apex of tube and occluding throat, blue to brownish, 2.5–3.0 mm long, weakly diverging, free or connate at base; anthers oblong-sagittate, connective broad and thecae restricted to margins, dehiscing laterally, 5–6 × 1.5–2.0 mm (at anthesis), initially erect, later diverging and becoming slightly twisted, black; pollen yellow. *Ovary* ovoid, 2 mm long; style straight and erect, dividing at or just above mouth of tube, branches blue, arching outward, 3–4 mm long, ultimately reaching base of anthers. *Flowering time*: late September and October.

Distribution and biology: currently known from two populations in the valley of the Hoeks River in the south-western corner of the Worcester Karoo (Figure 2), *Ixia atrandra* grows on clay soils derived from shales of the Bokkeveld series in open shrubland dominated by the renosterbos, *Elytropappus rhinocerotis*. The flowers of *I. atrandra* display the typical adaptations for pollination by monkey beetles (Scarabaeidae: Rutelinae). These include the congested, subcapitate inflorescence, brightly coloured bowl-shaped flowers with central dark marking, lack of nectar or fragrance and dark anthers. The broadened connectives are part of this syndrome and are matched by remarkably similar sagittate anthers in some beetle-pollinated species of *Babiana*, particularly *B. villosa*, and *B. melanops*.

History: this species was first collected in October 1996 as a voucher for studies on beetle-pollination, but the material was inadequate for formal description. A later collection from nearby serves as source of the type material.

Diagnosis and relationships: *Ixia atrandra* appears to be most closely allied to *I. rouxii* G.J.Lewis, with which it shares pink flowers with a large central stain, tepals which are narrowed and almost clawed below and black anthers with widened connectives. *I. rouxii* is restricted to the upper reaches of the Breede River and the contiguous Berg River, between Porterville and Wolseley. An unusual feature of both species, but particularly prominently developed in *I. atrandra*, is the presence of dark blue amber-like deposits on the anther connective. These appear to be hardened secretions from the epider-

mis. *I. atrandra* differs from *I. rouxii* in its four (occasionally three), lanceolate leaves 6–10 mm wide, typically unbranched stem (or with a single, ascending branch) and distinctive oblong-sagittate anthers with a broad connective about 1.5 mm wide and the thecae dehiscing laterally. *I. rouxii* typically has five to six (rarely four) almost linear leaves 2–3(–6) mm wide and is distinctive in its sharply spreading branches, and while the anther connectives are widened, they are less than 1 mm wide, and the anthers dehiscence outwards. A third species with pink or white flowers with a prominent dark centre and black anthers, *I. versicolor* G.J.Lewis, is probably also part of this alliance. A local endemic restricted to damp, gravelly renosterveld flats at Gordon's Bay, it is distinguished from the other two species by its conspicuously thickened, crenulate leaf margins and elliptic tepals that are not narrowed into claws at the base. These three species appear to be geographic segregates restricted to lowland renosterbos shrubland.

Additional material examined

WESTERN CAPE.—3319 (Worcester): Brandvlei hills south of Worcester, clay ground in renosterveld, (–DD), 26-10-1996, *Goldblatt 10568* (MO).

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