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Four new species of iridaceae from the Western Cape, South Africa

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ABSTRACT

Four new species of Iridaceae from the Western Cape, South Africa are described. All four are evidently range-restricted. *Hesperantha novacampestris* is one of very few species of Iridaceae recorded from the Nuweveldberge escarpment inland of Beaufort-West. It is a highly distinctive species in sect. *Concentricae* characterized by an almost acaulescent habit, linear leaves twisted or coiled at the tips, and 1-flowered spikes of diurnal, shallowly cup-shaped white flowers with almost obsolete tube. *Ixia ebrahimii* from the upper Breede River Valley is distinguished from other members of sect. *Hyalis* by pink flowers with a short perianth tube combined with very unusual long-exserted, unilateral stamens. *Moraea anastasia* is a surprising discovery from the lower slopes near Stellenbosch that appeared after the felling of a pine plantation. A member of sect. *Vieusseuxia*, it appears to be allied to *M. bellendenii* and *M. tricuspidata* but is well-separated from them by the shorter outer tepal claws and much wider limbs with bluish black marking at the base. *Moraea goldblattiana* from the southern Knersvlakte between Vanrhynsdorp and Vredendal is vegetatively and florally similar to the Richtersveld endemic *M. flexicaulis* in sect. *Flexuosae* but is readily distinguished by its larger size, spathulate tepals with suborbicular limbs, and much longer ovary developing into a fusiform, short-beaked capsule.

1. Introduction

Southern Africa, comprising the subcontinent south of the Cunene–Limpopo River axis, is a major centre of radiation for Iridaceae, accounting for 1 215 species in 36 genera, thus slightly more than half of the family (Goldblatt and Manning, 2020). Iridaceae have been very well-studied both taxonomically and phylogenetically (Goldblatt and Manning, 2008), although the relationships within most of the genera remain to be investigated. The southern African species in particular have been intensively studied over many decades, culminating in a recent comprehensive monographic treatment for the region (Goldblatt and Manning, 2020). Even so, a trickle of undescribed species continues to be uncovered, largely through the increasing popular interest in the online publication of observations of wild species on the iNaturalist platform (https://www.inaturalist.org) as well as the work done by CREW (Custodians of Rare and Endangered Wildflowers) through the Botanical Society of southern Africa (https://www.botanicalsociety.org.za) and the South African National Biodiversity Institute (https://www.sanbi.org).

Five new species of Iridaceae from southern Africa, in the genera *Geissorhiza* Ker Gawl. and *Moraea* L., were discovered and described in the past few years, largely as a result of the activities of CREW (Goldblatt et al., 2021a, b, 2022; Manning and Goldblatt, 2024). All of these species are range-restricted endemics from the Core Cape Floristic Region, where the family is especially well-represented (Manning and Goldblatt, 2012). Here we describe an additional four range-restricted species discovered in the last few years, once again largely through the activities of CREW. Three of the new species, *Ixia ebrahimii* J.C.Manning, *Moraea anastasia* J.C.Manning & B.du Preez and *M. goldblattiana* J.C.Manning & N.A.Helme are from the Core Cape Floristic Region while the fourth, *Hesperantha novacampestris* J.C.Manning & N.T.Moolman, is from the Nuweveldberge inland of the region.

The Core Cape Floristic Region, with over 9 200 species of flowering plants, is well known for its high numbers of often very localized taxa (Manning and Goldblatt, 2012). The continuing discovery of undescribed local endemics in the CCFR is consistent with the findings of Treurnicht et al. (2017) that range-restricted taxa comprise the bulk of the more recently described taxa from the region. The

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Nuweveldberge, the central and most arid section of the Great Escarpment of South Africa, has a correspondingly depauperate flora numbering under 1 150 species, with <0.5 % endemic (Clark et al., 2011). Iridaceae are especially poorly represented there and the discovery of a new endemic species is thus a significant addition to the flora of the Nuweveldberge.

2. Materials and methods

The new taxa were described from living plants collected in the field, where ecology and habitat details were noted. Type material was collected under CapeNature permits CN 35–28–15,073 and AAA 008–00,222–0028. We also examined all relevant material in BOL, MO, NBG, PRE and SAM (abbreviations following Holmgren et al., 1990), the herbaria containing the most significant holdings of southern African flora. No additional material of any of the taxa was found. Additional sight records for three of the species were located on the online platform iNaturalist (https://www.inaturalist.org) and are cited under each species.

Species concepts follow those used by Goldblatt and Manning (2020) in which species are recognized as morphologically, ecologically and geographically coherent entities that are separated from similar taxa by at least one morphological feature consistent with the discrimination among other allied taxa. Author names are abbreviated following the International Plant Names Index (https://www.ipni.org), and specimens are cited following the Quarter Degree Reference System of Leistner and Morris (1976).

3. Results and discussion

3.1. New species of *hesperantha*

3.1.1. *Hesperantha novacampestris*

Hesperantha novacampestris J.C.Manning & N.T.Moolman, *sp. nov.* Type: South Africa, Western Cape, Loxton (3122): 60 km S of Loxton, Farm Dunedin, ± 1 km along road to farm Kafferskraal, (–CD), 5 Sep 2024, *J. Moolman s.n.* (NBG, holo.; MO, iso.).

Dwarf plants 20–60 mm high in flower. *Corm* ovoid with obliquely flattened side, 6–10 mm diam., tunics dark brown, ± concentric layers fragmenting irregularly into segments. *Stem* reaching shortly above ground level, solitary or 2 or 3 produced from base, partly concealed by leaf bases, smooth. *Leaves* 4 to 8, all basal, arcuate, linear-attenuate, helically twisted or coiled distally, 0.7–1.5 mm wide, leathery and glaucous, margins and main vein not thickened when fresh but evident when dry. *Spike* 1-flowered; bract 10–12 mm long, obtuse, glaucous flushed purplish, drying and membranous at the tip, inner bract slightly shorter than outer or ±as long, obtuse. *Flowers* erect, shallowly cup-shaped, white flushed and feathered pink on the reverse, with greenish yellow tube and base of tepals, median vein sometimes red adaxially, unscented; perianth tube funnel-shaped, 2–3 mm long; tepals spreading, subequal, oblanceolate, 10–14 × 4–6 mm, slightly concave. *Filaments* erect, 2–3 mm long; anthers remaining ± erect, 5–6 mm long, yellow with yellow pollen. *Style* ± 2 mm long, dividing just below the mouth of the tube at the base of the filaments, branches ascending and lightly twisted, 5–6 mm long, reaching middle or upper third of anthers. *Capsules and seeds* unknown. *Flowering time:* September. Fig. 1.

Distribution and habitat: evidently a local endemic of the Nuweveldberge plateau, known from three populations between Beaufort-West and Loxton in Western Cape, South Africa (Fig. 2); seasonally wet open clay flats in karroid shrubland.

The flowers are diurnal and open when temperatures rise, typically around 10h00 and close again in the mid-afternoon around 15h00. They attract frequent visits from bees and small beetles but are not evidently fragrant.

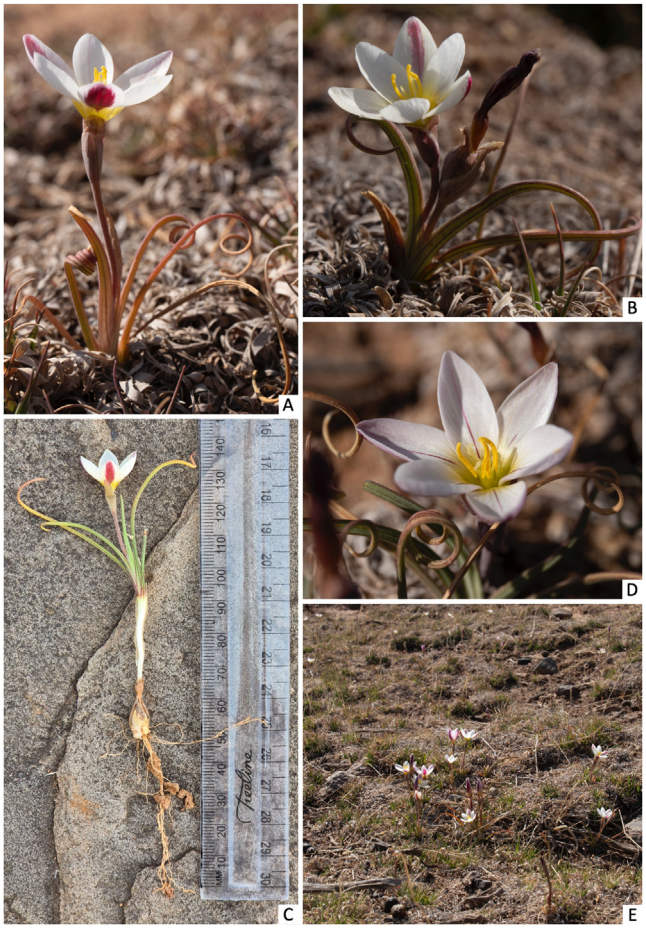

Fig. 1. *Hesperantha novacampestris* Western Cape, Nuweveldberge, Dunedin Farm. A & B, Plants showing dwarf habit, apically coiled foliage and 1-flowered spikes; C, Excavated plant showing small oblique corm with concentric tunics; D, Flower showing tepals with dark median streak and erect anthers; E, Habitat. Photographers: N.T. Moolman (A, B, D, E), Johan Moolman (C).

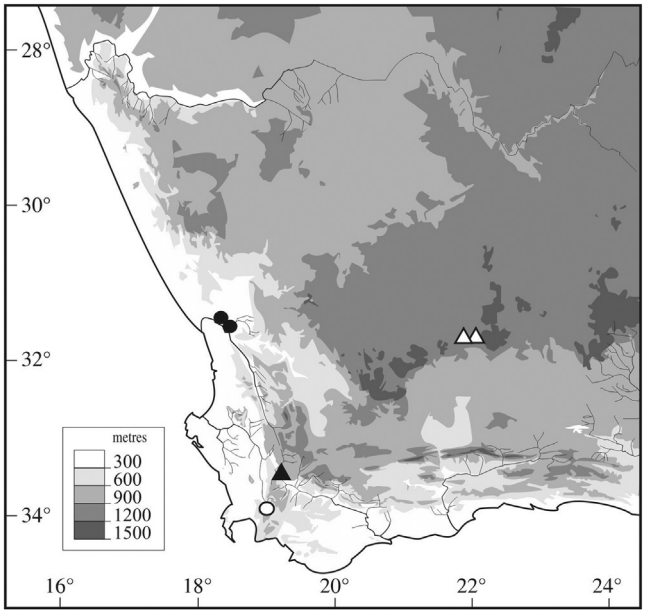

Fig. 2. Distribution of *Hesperantha novacampestris* △, *Ixia ebrahimii* ▲, *Moraea anastasia* ◯ and *M. goldblattiana* •.

Diagnosis and relationships: the almost acaulescent habit, linear leaves helically twisted or coiled at the tips, 1-flowered spikes, and diurnal, shallowly-cupped flowers with almost obsolete perianth tube 2–3 mm long immediately distinguish *Hesperantha novacampestris* from all other species in the genus. The distinctive growth form and cup-shaped flowers are strikingly reminiscent of purple-flowered *Geissorhiza spiralis* (Burchell) M.P.de Vos and yellow-flowered *G. corrugata* Klatt from similar habitats on the Roggeveld Plateau. All three species also share similar obliquely ovoid corms with concentric tunics and it is essentially the fact that the style in *H. novacampestris* divides just below the mouth of the perianth tube that predicates its placement in the genus *Hesperantha* rather than in *Geissorhiza*. This placement is also supported by the long style branches that are typical of *Hesperantha*, although the erect anthers are unusual in the genus. However it is significant that the generic placement of these two species of *Geissorhiza* was also discussed by Goldblatt (1985) on account of their short styles although in both species the style is longer than the branches and exserted beyond the mouth of the perianth tube, dividing near the base of the anthers and not within the tube as in *H. novacampestris*.

The oblique corm with concentric tunics places *H. novacampestris* in sect. *Concentricae* Goldblatt but relationships among the species of *Hesperantha* have not been tested. The immediate relationships of *H. novacampestris* are not clear and certainly the short-tubed flowers set it apart from the two other almost acaulescent species in the section, *H. latifolia* (Klatt) M.P.de Vos and *H. luticola* Goldblatt, both of which have broad, falcate leaves and salver-shaped flowers with long perianth tubes.

Additional specimen: Western Cape, Loxton (3122): 60 km S of Loxton, Farm Dunedin, ± 2 km S of Visserskop, (–CD), 5 Sep 2024, J. *Moolman s.n.* (NBG).

Additional sighting: Western Cape, Beaufort West (3222): near Uitspansfontein, (–AA), 9 Sep 2022, *_3foxes*https://www.inaturalist.org/observations/134736461.

Etymology: the epithet from the Latin *nova*, new, and *campestris*, plains, references the occurrence of the species on the Nuweveld escarpment (Afrikaans *nuwe,* new, and *veld*, fields or other natural vegetation).

Conservation notes: We have direct observations only for the two populations on Dunedin Farm. The first population (31°56′13.7″S 22° 24′14.8″E) numbers 100–150 plants in a small area 20 × 20 m of very fine, poorly draining clay soil. The second population (31° 59′34.8″S 22°21′34.7″E) is approximately 7 km southwest of the first and is smaller than the first, with ± 30 individuals counted. The soil here is similarly poorly draining clay, though somewhat rockier. The third population (https://www.inaturalist.org/observations/134736461) appears to be <20 km southwest of the Dunedin populations but no estimate of size is available.

Insufficient information is currently available for an assessment and the species is provisionally assessed as Data Deficient (DDD).

3.2. New species of *Ixia*

3.2.1. *Ixia ebrahimii*

Ixia ebrahimii J.C.Manning, *sp. nov.* Type: South Africa, Western Cape, Worcester (3319): Romansrivier Farm, along track above big dam, 33.47129° S 19.22319° E (–AC), 23 Oct 2024, *I. Ebrahim 1816* (NBG, holo.).

Plants 200–500 mm high. *Corm* depressed-globose, ± 10 mm diam., tunics of pale fine fibres. *Stem* with up to 3 short, rigid, spreading branches subtended by minute, scale-like bracts and prophylls 1–2 mm long. *Leaves* 5, linear-lanceolate, reaching to ± base of spike, 4–5 mm wide, midrib lightly thickened but margins lightly or scarcely thickened. *Spike* densely 4- or 5-flowered, branches 2- or 3-flowered; bracts pale and translucent flushed pink distally, outer with three equally prominent veins pigmented purple distally, 3-toothed, 4–5 mm long, inner forked apically, ± as long as the outer. *Flowers* suberect, funnel-shaped, deep pink with the outer tepals flushed dark reddish at the tips, with a pale green tube and mouth, unscented; perianth tube slender widening slightly towards mouth, 7–8 mm long, ± 4 mm diam. at mouth; tepals suberect to slightly diverging and perianth thus remaining deeply cupped, subequal, oblanceolate, 14–16 × 6–7 mm, slightly concave. *Filaments* unilateral opposite the lower tepal and curved upwards at the tips, 9–10 mm long, inserted ± 2 mm below top of tube thus exserted 7–8 mm, white with pink tips; anthers parallel, 4–5 mm long, bright yellow with yellow pollen. *Style* declinate below the anthers and dividing at or just beyond the anther apices, branches ± 2.5 mm long, white with pink branches. *Capsules and seeds* unknown. *Flowering time:* late September to October. Fig. 3.

Distribution and ecology: Ixia ebrahimii is known from a single small population at the western foot of the Waaihoekberge on the farm Romansrivier south of Wolseley in the upper Breede River Valley, Western Cape, South Africa (Fig. 2); on a south-trending clay slope in Breede Shale Renosterveld (Mucina and Rutherford, 2006), flowering after a burn.

Diagnosis and relationships: Ixia ebrahimii is a highly distinctive species that cannot be confused with any other. The fan of five leaves grading upwards and the funnel-shaped perianth with filaments inserted below the mouth of the tube place it in sect. *Hyalis* (Baker) Diels. Species relationships within *Ixia* remain to be tested, however, and sect. *Hyalis* in particular lacks any evident synapomorphies.

Ixia ebrahimii is distinguished within the section by the relatively soft-textured leaves, and the divaricately branched flowering stem with suberect, funnel-shaped pink flowers with the unusual combination of a short perianth tube 7–8 mm long and relatively long stamens with filaments 9–10 mm long and well-exserted from the tube for 7–8 mm, and the style branching at or just beyond the anther

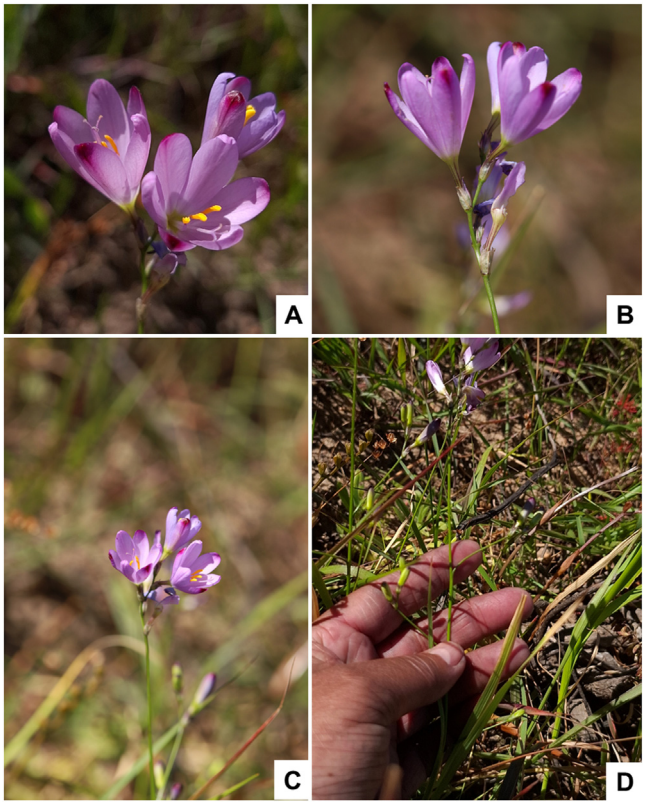

Fig. 3. *Ixia ebrahimii* Western Cape, Romansrivier. A, Flowers showing unilateral stamens and long style dividing at or just beyond anther apices; B, Flowers showing relatively short, funnel-shaped perianth tube; C, Inflorescence; D, Plant showing foliage and divaricate branches. Photographer: Ismail Ebrahim.

apices. Most distinctively, however, the stamens are conspicuously unilateral above the lower tepal, with upcurved tips and bright yellow, parallel anthers.

In general appearance *Ixia ebrahimii* most closely resembles *Ixia longituba* N.E.Br. in ser. *Hyalis* (Baker) Goldblatt & J.C.Manning but this Overberg species has firmer-textured leaves with heavily thickened margins, and flowers with a significantly longer perianth tube, (10–)12–33(–35) mm long, and although both species have similar long-exserted stamens, they are erect and clustered around the central style in *I. longituba*, thus quite unlike the unilateral stamens of *I. ebrahimii*.

Similar unilateral stamens are found in just a few species in the genus, notably *I. pauciflora* G.J.Lewis and *I. reclinata* Goldblatt & J.C. Manning, both members of linear-leaved ser. *Capillares* Goldblatt & J. C.Manning of sect. *Morphixia* Goldblatt & J.C.Manning (P. Goldblatt and Manning, 2020).

Etymology: the species is named for Ismail Ebrahim, Project Manager CREW CFR, who discovered the species and who has contributed immensely to the conservation of the local flora as part of the CREW (Custodians of Rare and Endangered Wildflowers) programme at the Botanical Society of South Africa and the South African National Biodiversity Institute.

Conservation notes: Ixia ebrahimii is known from a single small population of just four plants. It is possible that it occurs in suitable habitats elsewhere along the foot of the Waaihoekberge but much of this habitat has been cleared for orchards and vineyards. Given the extremely localized distribution, historical habitat loss and the continued threats of alien invasive species and potential future developments, this species is assessed as Critically Endangered (CR B1ab(iii, iv,v) + B2ab(iii,iv,v)) based on the criteria and categories of the IUCN (2024).

3.3. New species of *moraea*

3.3.1. *Moraea anastasia*

Moraea anastasia J.C.Manning & B.du Preez, *sp. nov.* Type: South Africa, Western Cape, Cape Town (3318): Stellenbosch, Erf 3363, Botmaskop, 33.92911° S 18.90296° E (–DD), cleared area, 2 Oct 2024, *B. du Preez 1014* (NBG, holo.; MO, iso.).

Plants 300–550 mm high. *Corm* subglobose, 10–20 mm diam., tunics of pale medium-textured fibres. *Stem* simple or branched from upper axil, branch erect alongside main axis but flexed outwards at the spathe-node, sheathing leaves 2, with dry attenuate tips. *Foliage leaf* solitary, basal, channeled, 4–5 mm wide, longer than the stem and trailing distally. *Rhipidial spathes* green but dry distally with dry attenuate apices, inner 60–80 mm long, outer ± ½ as long. *Flowers* long-lived, white, outer tepals with dark bluish black lunate markings at base usually edged pale yellow with dark speckles, claws bluish black, inner tepals dark bluish black tipped whitish on the cusps; tepals very unequal, outer tepals 24–30 × 18–25 mm, claws suberect, ± ½ as long as limbs, 3–5 mm wide at midpoint, pubescent, with small denticulate scale at base, limbs spreading, suborbicular to oblate, touching or overlapping adjacent outer tepals, inner tepals suberect, cuneate-spathulate, 9–10 mm long (excluding central cusp), tricuspidate, lateral lobes obtuse, central cusp obliquely curled inwards, 3–5 mm long. *Filaments* 4–5 mm long, united almost entirely in a minutely papillate column, free in upper 0.5–1.0 mm, white flushed bluish; anthers straight, ± 6 mm long, dark bluish with creamy yellow pollen. *Ovary* ellipsoid-obconic, 9–11 mm long; style branches ascending, 6–7 mm long, crests 5–6 mm long, white. *Capsules and seeds* unknown. *Flowering time:* September to mid-October. Fig. 4.

Distribution and ecology: Moraea anastasia is known only from the lower south-facing slopes of Botmaskop Mountain on the outskirts of Stellenbosch (Fig. 2). First seen in September 2021 (iNaturalist) following a mountain fire, the type population was found after the felling of a plantation of pine trees in 2024. It has only been recorded from two subpopulations approximately 2 km apart, growing in well-drained granite- and shale-derived soils, in Cape Wineland Shale Fynbos and Boland Granite Fynbos (Mucina and Rutherford, 2006). It appears to flower only in cleared vegetation after fire or post pine harvesting.

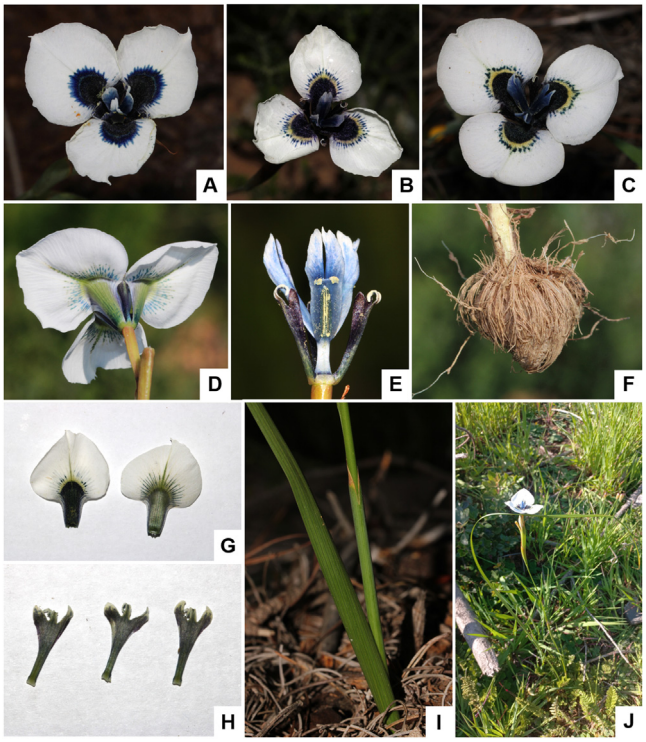

Fig. 4. *Moraea anastasia* Western Cape, Stellenbosch. A–C, Flowers, top view showing variation in markings; D, Flower, back view; E, Dissected flower with outer tepals removed to show inner tepals, androecium and style branches; F, Corm showing pale, finely fibrous tunics; G, Dissected outer tepals showing adaxial (left) and abaxial (right) surfaces; H. dissected inner tepals; I, Base of plant showing solitary foliage leaf; J, Habit. Photographer: Brian du Preez.

The moderately large flowers with dark central eye conform to the beetle-pollination syndrome that is very well developed in the southwest (Goldblatt and Manning, 2011), and we have observed visits to the flowers by several scarab beetles, including *Oxythyrea marginalis* (Common Dotted Fruit Chafer).

Diagnosis and relationships: the solitary basal foliage leaf and reduced, tricuspidate inner tepals with incurved inner cusp place *Moraea anastasia* in subg. *Vieusseuxia* (D.Delaroche) Baker sect. *Vieusseuxia* (D.Delaroche) Goldblatt & J.C.Manning (Goldblatt et al., 2013). This diverse section includes 38 species in southern Africa concentrated in the extreme southwest of the region (Goldblatt and Manning, 2020; Goldblatt et al., 2021). Within the section, *M. anastasia* is distinguished by the moderately large, white flowers with prominent bluish black crescent-shaped markings at the base of the outer tepal limbs, the outer tepals with orbicular or oblate limbs ± twice as long as the claws and 18–25 mm wide, with the edges touching or shortly overlapping the adjacent outer tepals. The cuneate-spathulate inner tepals are 9–10 mm long with an obliquely incurled central cusp 3–5 mm long, and the relatively short filaments are 4–5 mm long and shorter than the style branches.

The moderately large flowers with outer tepal limbs as wide as or wider than long and tricuspidate inner tepals with an incurled central cusp are shared with *M. bellendenii* (Sweet) N.E.Br. and *M. tricuspidata* (L.f.) G.J.Lewis, both from the southwestern and southern coastal and near-inland parts of Western Cape, including around Stellenbosch where *M. anastatia* occurs. Larger flowered forms of these two species are readily distinguished from *M. anastasia* by outer tepals with ovate

to broadly ovate limbs ± as long as the claws and always well separated from the adjacent outer tepals, and the pale yellowish claws and nectar guides, variously speckled or spotted with brown or black. *Moraea bellendenii* is further recognised by its pale watery yellow flowers, the other two taxa with white flowers.

Commensurate with its relatively short outer tepal claws, *M. anastasia* has relatively short inner tepals 9–10 mm long and similarly short stamen filaments 4–5 mm long, with anthers ± 6 mm long. The shallow, cup-shaped flowers of *M. anastasia* have a superficial similarity to *M. villosa* (Ker Gawl.) Ker Gawl., which differs in its velvety stems, mauve or rarely orange outer tepals with large iridescent blue marking contrasting with orange or yellow hairs on the claws, and a long, laxly trailing central cusp on the inner tepals.

Additional sightings: WESTERN CAPE. 3318 (Cape Town): Stellenbosch (–DD), 23 Sep 2021, N. *Myburgh*https://www.inaturalist.org/observations/95853004 28 Sep 2021, *S. de Hosse*https://www.inaturalist.org/observations/96498558 2 Oct 2023, *B. du Preez* https://www.inaturalist.org/observations/186676761 15 Oct 2024, *B. du Preez*https://www.inaturalist.org/observations/249663531.

Etymology: the species epithet is derived from the Greek *anastasis*, resurrection, alluding to the dramatic appearance of the plants after decades of being under a pine plantation.

Conservation notes: Moraea anastasia is known from two subpopulations. The Extent of Occurrence (EOO) and Area of Occupancy (AOO) calculated based on available data are 1 km^2 and 4 km^2, respectively. This species is highly restricted based on current available information, with much of its potential historical habitat having been transformed for vineyards and forestry. The type location was until recently under active pine plantations, that were harvested approximately one year before its discovery. This subpopulation comprises <20 mature individuals, but more may be found after rehabilitation of the site and removal of dense remerging pine stands nearby. The status of the second subpopulation is unclear but the habitat appears to be in a good condition and is not threatened. Given the extremely localized distribution, historical habitat loss and continued threat of alien invasive species and potential future developments, this species is assessed as Critically Endangered (CR B1ab(iii,iv,v) + B2ab(iii,iv,v)) based on the criteria and categories of the IUCN (2012).

3.3.2. *Moraea goldblattiana*

Moraea goldblattiana J.C.Manning & N.A.Helme, *sp. nov.* Type: South Africa, Western Cape, Vanrhynsdorp (3118): Vredendal, 31° 38′15.05″ S 18°30′36.14″ E (–DA), loamy soil in gannabosveld, 24 Sep 2024, *N. Helme 10,604* (NBG, holo.).

Plants 300–400 mm high. *Corm* subglobose, 20 mm diam., tunics of matted, coarse, wiry, claw-like fibres. *Stem* flexuose, flexed above sheathing base of each leaf, well-branched with up to two branches at each node above the lowermost, without sheathing leaves. *Leaves* 3 to 5, lowermost inserted shortly above ground and largest, upper leaves progressively shorter, falcate, somewhat trailing distally, channeled, up to 100 × 3–6mm. *Rhipidial spathes* acute to attenuate with dry apices, inner 60–70 mm long, outer mostly ± $^1/_2$ as long, free and arching outward in distal $^1/_3$. *Flowers* fugacious, orange or less commonly pale yellow, claws bright yellow adaxially and green abaxially, the outer speckled with brown, limbs all with bright yellow nectar guide at base edged with darker brown radiating out along the veins; tepals unequal, spathulate, limbs suborbicular with the inner twisted through 45°, outer tepals 33–35 × 13–15 mm, claws erect, slender, 12–14 mm, limbs spreading or deflexed, inner tepals 30–33 × 12 mm, claws slightly spreading, slender, ± 12 mm long, limbs spreading. *Filaments* 9–10 mm long, united in a cylindric column, free in upper 1 mm and diverging, yellow; anthers straight, ± 4 mm long, yellow. *Ovary* cylindric, ± 20 mm long, flushed red; style branches linear, ± 4 mm long, crests ± 5 mm long, bright yellow. *Capsules* fusiform and shortly beaked, 20–30 mm long, dark grey with pale veins. *Seeds* ovoid-angled, ± 1.5 × 1.0 mm, rugulose. *Flowering time:* late July or August to September, lasting one day Fig. 5.

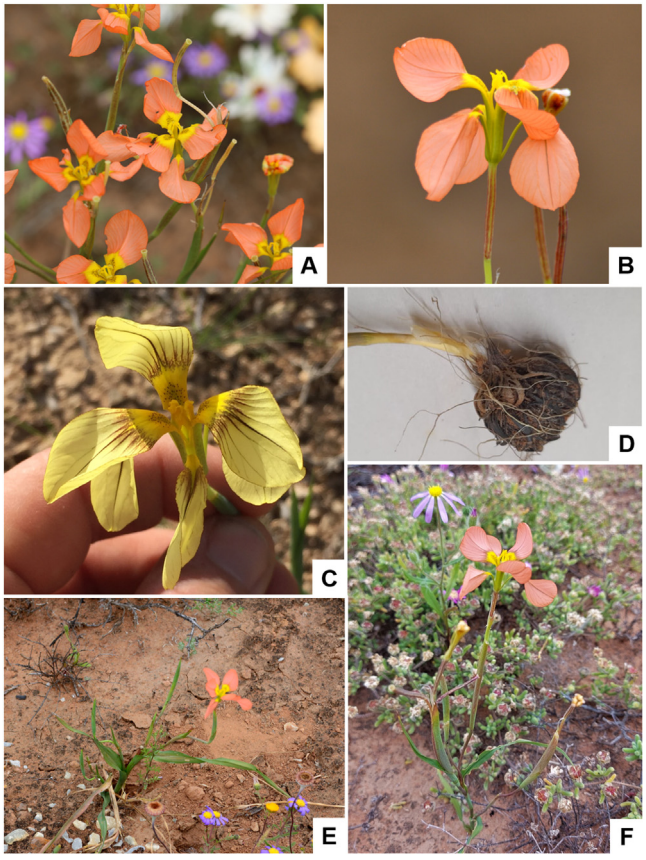

Fig. 5. *Moraea goldblattiana* Western Cape, Vanrhynsdorp. A, Branched plant with numerous inflorescences and fusiform capsules; B, Single flower showing biseriate perianth and long, cylindrical ovary; C, Single yellow flower showing spotted outer tepal claws; D, Corm showing dark, matted, claw-like tunics; E & F, Habit. Photographers: Corne Rautenbach and Wilna Steenkamp (A, B, D–F), Brian du Preez (C).

Distribution and ecology: a narrow endemic of the southern Knersvlakte in Western Cape, South Africa, where it is known from three populations between Vanrhynsdorp and Vredendal (Fig. 2); on loamy flats in open succulent karoo shrubland, at the type locality north of Vredendal occurring in Vanrhynsdorp Gannabosveld (Mucina and Rutherford, 2006).

Diagnosis and relationships: Moraea goldblattiana is a very distinctive species closely resembling the rare Richtersveld endemic *M. flexicaulis* Goldblatt in habit and flowers. Both species share black, matted corm tunics and a characteristic flexuose stem with 3 to 5 falcate leaves, none entirely sheathing and all with free blades. The flowers in the two species are also very similar, with subequal, strongly clawed tepals, the claws of the outer series erect and the limbs deflexed but those of the inner series diverging with spreading limbs, giving the flowers a distinctively biseriate form. The inner tepal limbs are twisted through 45°, thus resembling a propeller, and the filaments are fused in a cylindric column free at the tips. The style branches are narrow, with well-developed crests.

The two species, however, differ markedly in size. *Moraea goldblattiana* is a much larger species, the plants 300–400 mm high, with inner spathes 60–70 mm long, compared to diminutive *M. flexicaulis* just 60–150 mm high with inner spathes 25–50 mm long. The two species also differ significantly in floral size and proportions. The flowers of *M. goldblattiana* are notably larger than those of *M. flexicaulis*, with distinctive spathulate tepals with suborbicular limbs, the outer 33–35 mm long with limbs 13–15 mm wide, longer style crests ± 5 mm long, thus slightly longer than the branches, and a

much longer ovary ± 20 mm long, maturing into a distinctive, shortly beaked fusiform capsule 20–30 mm long. *Moraea flexicaulis* is smaller in all these respects, with oblanceolate tepals with obovate limbs, the outer tepals 28–30 mm long with limbs ± 8 mm wide, short style crests ± 2 mm long, thus half as long as the style branches, and a much shorter ovary ± 7 mm long, maturing into an ovoid capsule 12–15 mm long. The flowers of *M. flexicaulis* are so far only recorded to be yellow but in *M. goldblattiana* are usually orange or sometimes yellow. These differences in flower and fruit size are combined with a significant disjunction in distribution, with *M. flexicaulis* restricted to northern Namaqualand in Northern Cape, where it has been collected on the Anenous Flats west of Steinkopf and near Eksteenfontein in the Richtersveld (Goldblatt and Manning, 2002; 2020).

The distinctive growth form and floral morphology in these two species is unique in the genus and is compelling evidence of a close relationship between them. Molecular sequence data place *M. flexicaulis* in subg. *Homeria* (Vent.) Goldblatt & J.C.Manning (Goldblatt et al., 2002), where it is segregated in sect. *Flexuosae* Goldblatt (Goldblatt et al., 2013) along with two other species with a similar vegetative morphology but rather different flowers that are typical of other species in the subgenus in their highly reduced style crests (Goldblatt and Manning, 2020). The fusiform capsules in *M. goldblattiana* are exceptional in the section, all other members of which have ovoid or clavate capsules 10–15 mm long.

Additional sightings: WESTERN CAPE. 3118 (Vanrhynsdorp): Vanrhynsdorp, Aties Farm, (AD), 18 Jul 2021 [not yet flowering], N. *Helme* https://www.inaturalist.org/observations/87959725 25 July 2021, *B. du Preez* https://www.inaturalist.org/observations/88591926 east of Vredendal, 12 Sep 2022, *C. Rautenbach*https://www.inaturalist.org/observations/95682636 [all accessed 14 Nov 2024].

Etymology The species is named for Dr Peter Goldblatt (1943–), whose dedicated studies on the taxonomy of the African Iridaceae have made it one of the best understood families on the continent.

Conservation notes: Moraea goldblattiana is known from two or three populations between Vanrhynsdorp and Vredendal, a distance of ± 20 km, with an EOO of <100km^2. None of the populations are in a conservation area and all are vulnerable to mining, cultivation and urban development, with a new municipal landfill and large opencast limestone mining operations being developed within the known range. The species was recorded as common in the Aties population where the new limestone mine will be situated but only a single plant was found in the population near Vredendal, between an industrial area and a solar energy facility. The species should thus be regarded as an extremely range-restricted taxon with likely current and future loss to all of the known populations, and qualifies for listing as Critically Endangered (CR B1b(i, ii, iii,iv,v) + B2b(i, ii, iii,iv,v)) based on the criteria and categories of the IUCN (2012).

Declaration of competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

CRediT authorship contribution statement

J.C. Manning: Writing – original draft, Validation, Methodology, Investigation, Formal analysis, Conceptualization. **N.A. Helme:** Writing – review & editing, Validation, Investigation. **N.T. Moolman:** Writing – review & editing, Validation, Investigation. **B. du Preez:** Writing – review & editing, Validation, Investigation.

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