Moraea orthrosantha (Iridaceae: Irideae), a new species from Namaqualand, South Africa

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Background: Recent fieldwork in Namaqualand, Northern Cape Province, South Africa, indicated the existence of an undescribed member of Moraea subgenus (subg.) Umbellatae Goldblatt & J.C. Manning, a small, early branching clade of the genus.

Objectives: To describe the new species of Moraea subg. Umbellatae.

Method: Recent collections were compared with existing material and published literature.

Results: Moraea orthrosantha is described as a new species, differing from Moraea margaretae in the well-developed nodes between the cauline leaves. Two earlier collections of the species were misidentified as M. margaretae.

Conclusion: The new species increases our understanding of the diversity of Moraea in southern Africa and assists in conservation assessments of both M. margaretae and M. orthrosantha.

Introduction
Fieldwork in Namaqualand, Northern Cape Province, South Africa, in late spring of 2012 and 2013 yielded the discovery of a population of a yellow-flowered Moraea, representing an undescribed member of subgenus (subg.) Umbellatae Goldblatt & J.C. Manning, an early branching clade of the genus currently comprising nine species (Goldblatt & Manning 2013; Goldblatt, Manning & Schnitzler 2013). The new species, described here as Moraea orthrosantha, has a well-developed and multi-branched aerial stem with a solitary leaf at each node, conventional Moraea-type flowers with larger outer tepals and well-developed, petaloid style branches with prominent crests. These features are plesiomorphic in the genus (Goldblatt et al. 2013), suggesting that M. orthrosantha is unspecialised in subg. Umbellatae. The largely sub-Saharan genus Moraea now comprises some 226 species (Goldblatt & Manning 2013), most of them restricted to the southern African winter rainfall region. Subgenus Umbellatae now includes 10 species, all endemic to western South Africa and extending from the Richtersveld of Northern Cape Province to the Cape Peninsula and Caledon District in Western Cape Province. We include a key to the species of subg. Umbellatae.

Research method and design
We examined all relevant collections at Bolus Herbarium, University of Cape Town (BOL); Compton Herbarium, South African National Biodiversity Institute, Cape Town (NBG), National Herbarium, South African National Biodiversity Institute, Pretoria (PRE) and South African Museum Herbarium, South African National Biodiversity Institute, Cape Town (SAM), the primary southern African herbaria (acronyms after Holmgren, Holmgren & Barnett 1990). Plants were examined in the field for 3 h and 12 specimens were pressed as type material for distribution to herbaria (as cited below). Type material was collected under permit number 010/2012 from the Northern Cape Department of Environment and Nature Conservation. Additional specimens are cited following the Degree Reference System (Leistner & Morris 1976).

Taxonomic treatment
Moraea orthrosantha Goldblatt & J.C. Manning, sp. nov.

Type: SOUTH AFRICA. Northern Cape: 3017 (Hondeklipbaai):15.5 km N of Garies, sandy slopes at ± 645 m, 30°27’ S 17°37’ E (–BD), 10 Oct. 2013, Goldblatt & Porter 13990 (NBG, holo.; K, MO, PRE, iso.).

Description
Plants up to 350 mm high. Corm: 8 mm – 11 mm diameter; tunics brown, ± woody, inner layers entire, outer splitting from base. Stem: with three or four (five) internodes, with one or
Source: Artist – John Manning
Scale bar: (a) 10 mm; (b) 2 mm.

FIGURE 1: Diagrammatic representation of *Moraea orthrosantha* holotype depicting, (a) the flowering plant and (b) stamens and style.
two branches at each node; branches slightly flexed above sheath of subtending leaf. Leaves: three to five, lowermost longest, inserted 10 mm – 20 mm above ground, linear, channelled, ± straight or loosely twisted, up to 450 mm long, upper leaves progressively shorter, none entirely sheathing. Rhipidial spathes: inner 35 mm – 40 mm long, ± truncate, apex brown, somewhat lacerated; outer half to two-thirds as long, with acute, brown apex. Flowers: buff-yellow, lightly brown-veined, outer tepal limbs with deep yellow nectar guides at bases edged brown, darkly veined abaxially, spreading slightly below horizontal, inner tepals with reddish-brown spot at bases of limbs, similarly spreading; outer tepals ob lanceolate, 30 mm – 32 mm long, limbs 20 mm – 22 mm × 10 mm – 12 mm, claws ± 10 mm long; inner tepals ob lanceolate, ± 22 mm × 5 mm – 6 mm. Stamens: with filaments 8 mm – 9 mm long, united in lower 5 mm – 6 mm, diverging distally; anthers dark purple, 3.5 mm – 5.0 mm long; pollen red. Ovary: exserted, oblong-elliptic, 5 mm – 6 mm long; style branches ± 10 mm long, crests 10 mm – 14 mm long, erect, narrowly wedge-shaped. Capsules: narrowly obovoid, 5 mm – 6 mm long; style branches ± 10 mm long, crests 10 mm – 14 mm long, erect, narrowly wedge-shaped. Seeds: softly angular, ± 1 mm long, with rugulo-reticulate surface, light yellow-brown. Flowering time: late September to late October; flowers opening ± 07:00 and collapsing ± 12:00 (Figure 1).

Distribution and ecology

*Moraea orthrosantha* is known only from a small area north of Garies in Northern Cape Province, South Africa, in the higher country south of Garagams (Figure 2). Plants appear to be restricted to locally wetter sites; in trampled or drier situations they are much smaller in size. The soil in which they grow is the typical granitic gravel of Namaqualand and plants sometimes occur in rocky ground. We did not make an accurate count of the number of plants at the site but we located over 40 individuals, including some immature and not of flowering age.

Etymology

As the specific epithet suggests, flowers open soon after sunrise and collapse at about noon. The epithet derives from the Greek *orthros* [morning] and *anthos* [flower]. There are few other examples of this flowering phenology in the genus and none known in subg. *Umbellatae*.

Conservation status

The habitat is relatively undisturbed, although it is located less than 20 m from the main road from Cape Town to Springbok. Future road expansion will severely impact the...
known habitat. Summer grazing by stock should not affect the population as the plants will be dormant. The possible occurrence of additional populations in the area requires further investigation.

**Diagnosis**

In its vegetative and floral morphologically, *M. orthrosantha* is perhaps the least specialised member of subg. *Umbellatae*. The species is distinguished by its vegetative habit: mature plants have stems up to 350 mm high with several leaves, one at each of up to four or five aerial nodes and one or two branches per node. The flowers are typical of the genus, having free tepals, well-developed petaloid style branches with erect crests and prominent nectar guides at the bases of the outer tepal limbs. Somewhat unusually, the bases of the inner tepal limbs are marked with a small, dark reddish-brown spot. The buff or dull yellow colour of the perianth is typical of the subgenus. In contrast, most other species of the subgenus have branches crowded at the first aerial node, this either approximately at ground level (*Moraea margaretae* Goldblatt) or well above ground level (*Moraea linderi* Goldblatt and *Moraea intermedia* Goldblatt & J.C.Manning). All three of these species have well-developed style branches and crests but other species have the style branches reduced to narrow lobes without crests (*Moraea maximiliani* (Schltr.) Goldblatt & J.C.Manning and *Moraea umbellata* Thunb.) or divided into paired filiform arms (*Moraea nana* (L.Bolus) Goldblatt and *Moraea singularis* Goldblatt & J.C.Manning). The remaining two species (*Moraea cooperi* Baker and *Moraea longiflora* Ker Gawl.) have the tepals united in a perianth tube.

The morning blooming phenology is unusual in *Moraea*: the flowers of most species of subg. *Umbellatae* for which phenology is known open in the late morning and collapse in the late afternoon (exact times are unrecorded for any of these species). Records for *M. margaretae*, with which *M. orthrosantha* is most easily confused, indicate that both were referred to as *M. margaretae* (Goldblatt 1976), an action clearly mistaken in light of the new collections and examination of living plants. These early collections bracket the type locality, 15.5 km north of Garies.

**History**

*M. orthrosantha* was first recorded by Rudolf Schlechter in 1897 at Brakdam between Garies and Garagams (south of Kamieskroon) in Namaqualand. His collection and a subsequent one made by Frances Leighton in 1945 constitute the only early records of the species. Both were referred to as *M. margaretae* (Goldblatt 1976), an action clearly mistaken in light of the new collections and examination of living plants. These early collections bracket the type locality, 15.5 km north of Garies.

**Additional specimens examined**


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**Competing interests**

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

**Authors’ contributions**

Both authors collaborated on all aspects of the research.

**References**


