

# *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, channeled, ± 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 oblanceolate, 30 mm – 32 mm long, limbs 20 mm – 22 mm × 10 mm – 12 mm, claws ± 10 mm long; inner tepals oblanceolate, ± 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*: exerted, 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, 9 mm – 11 mm long. *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

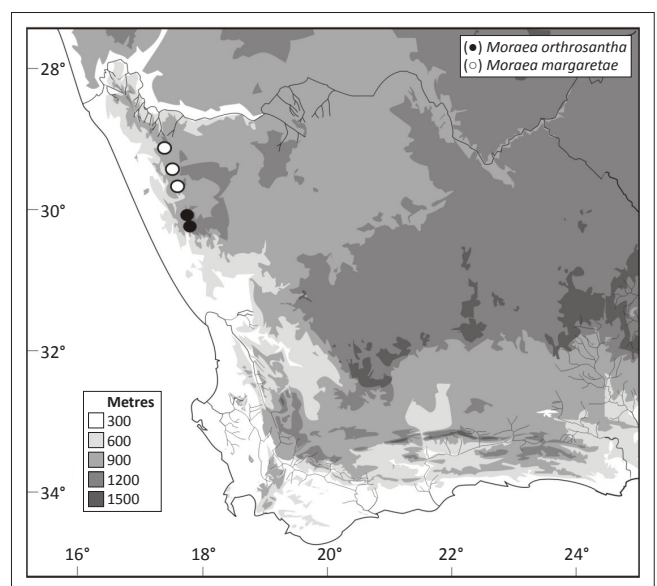


FIGURE 2: Distribution of *Moraea orthrosantha* and the closely related *Moraea margaretae*.

### BOX 1: Key to the species of *Moraea* subgenus *Umbellatae*.

- 1A. Plants with stem subterranean; leaves and rhipidia clustered at ground level:
- 2A. Tepals unequal, outer larger and with nectar guides at limb bases; style branches well developed with prominent crests.....*M. longiflora*
- 2B. Tepals subequal, outer ± as long as inner and both with nectar guides at limb bases; style branches divided almost to base into paired filiform arms without crests.....*M. singularis*
- 1B. Plants with stem aerial; either lowermost leaf inserted at ground level or all leaves and branches clustered at ground level but then rhipidia stalked:
- 3A. Foliage leaves all clustered at ground level; branches (when present) produced at ground level.....*M. margaretae*
- 3B. Plants wither with lowermost leaf inserted at or close to ground level or all leaves inserted at stem apex well above ground; branches (when present) arising well above ground:
- 4A. Lowermost leaf (of two or more) inserted at or close to ground level:
- 5A. Branches crowded at stem apex; tepals free.....*M. linderi*
- 5B. Branches borne along stem, not crowded above:
- 6A. Tepals free to base; inner tepals present.....*M. orthrosantha*
- 6B. Tepals united in short tube; inner tepals lacking.....*M. cooperi*
- 4B. All leaves clustered at stem apex well above ground:
- 7A. Style branches filiform and extended between stamens, without.....*M. nana*
- 7B. Style branches flattened, appressed to opposed anthers, with or without prominent crests:
- 8A. Style branches bearing prominent crests 10 mm – 12 mm long; filaments united in column 8 mm – 10 mm long.....*M. intermedia*
- 8B. Style branches without crests; filaments in column 5 mm – 7 mm long, united or free distally:
- 9A. Plants 150 mm – 450 mm high; outer tepals 19 mm – 27 mm × 9 mm – 12 mm; inner rhipidial spathes 30 mm – 40 mm long.....*M. umbellata*
- 9B. Plants 90 mm – 150 mm high; outer tepals 15 mm – 24 mm × 6 mm – 10 mm; inner rhipidial spathes 20 mm – 35 mm long.....*M. maximiliani*

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 the flowers open mid-morning and collapse toward sunset (Goldblatt 1986). Perhaps significantly, the three Namaqualand species of *Moraea* sect. *Flexuosae* Goldblatt, including *Moraea schlechteri* (L.Bolus) Goldblatt, also have fugaceous flowers opening early in the morning and collapsing after 12:30.

## History

*Moraea 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

SOUTH AFRICA. **Northern Cape:** 3017 (Hondeklipbaai): hills at 'Brackdam', (-BD), 08 Sept. 1897, *Schlechter 11120* (BM); 6 miles [ $\pm$  9 km] north of Garies (-DB), 03 Sept. 1945, *Leighton 1129* (BOL).

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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.

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