

# A distinctive new species of *Pterodiscus* (Pedaliaceae) from Angola

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## Abstract

A new species, *Pterodiscus angolensis*, is described from Angola. *P. angolensis* is a rare species known only from the dry windswept area inland from the small fishing village of Chapeau Armando in Angola. Its nearest relative is *P. aurantiacus*, from which it is easily distinguished by its smaller, pale yellow flowers and decumbent growth habit. Illustrations and a comparative table to distinguish between these two species of *Pterodiscus* are provided.

## Introduction

*Pterodiscus* is a genus poorly represented in Angola and only two, *P. aurantiacus* and *P. brasiliensis* are known from this country (Hardy, 1988; Peckover, 2016). Further south there are six species for the Flora of Southern Africa (FSA) region (South Africa, Namibia, Botswana, Lesotho, Swaziland).

Members of *Pterodiscus* are characterized by leaves that are opposite, subsucculent and elongated, with wavy or sinuate to dentate margins. They are bright green to greyish green, and when the surface is crushed, give off a pungently scented mucilage which has soap-like properties in water. At the base of each petiole on the sides of the axillary flower bud are a pair of prominent, often dark-coloured glands (extrafloral nectaries). These nectaries attract ants, presumably for protection, although in cultivated plants they appear to also act as pollinators.

The tubular flowers are borne in the axils of the leaves. They are short-lived and open usually for a single day under sunny conditions. As long as the annual stems grow healthily, a new set of flowers is produced at consecutive axils for an extended period of time. Each flower has five corolla lobes and five stamens, four of which are fertile, but the fifth one is very short and sterile (a staminodium). The four fertile stamens are inserted on the inside of the corolla tube above the ovary. Within the corolla tube on the ventral side there is in most species a landing area for visiting pollinators. This



Figure 1. Locality of *P. angolensis* in relation to Chapeau Armando.



Figure 2. Type locality of *P. angolensis* with limestone areas around it.

area consists of five raised ridges below the stamens and stigma and probably assists in bringing the pollinator into contact with the anthers and stigma above.

The indehiscent four-winged fruit, after which the genus is named (Greek *pteron* = wing + *diskos* = disc), develop shortly after fertilisation of the ovules and enlarge rapidly. When mature, often while still green in colour, these fruits are easily dislodged and dispersed by the wind. The seed of the Angolan spe-

cies number four per fruit (two per locule one above the other). These counts are based on observations of in situ as well as cultivated plants. The species in northeastern Africa can have more than four seeds per locule and up to eleven were found in each locule in a yet undescribed species from Ethiopia. The seed display various degrees of dormancy and usually relatively few will germinate in the first season after shedding of the fruit.



No material of this genus has been noticed on the occasions the author visited the large traditional muti (medicinal) market in downtown Johannesburg. However, members of the related genus *Harpagophytum*, in particular the root tubers of *H. procumbens* and *H. zeyheri* (devil's claw), are extensively used in traditional medicine.

## Taxonomic treatment

### *Pterodiscus angolensis* Peckover, *sp. nov.*

*Pterodiscus angolensis* resembles *P. aurantiacus* in having swollen fusiform roots also an aboveground caudex, but is easily distinguished from that species by having procumbent annual stems, flowers being smaller, light yellow to cream, and several other floral and fruit features (Table 1).

TYPE: Angola, Chapran Armanda, Specks 22800 (Namibe), (-AC), ????. . . . . 14 Jan 2013, Peckover 296 (PRU, holo).

Perennial herb up to 100 mm high; branching or single stemmed, the basal organ a swollen small above ground caudex, 20-30 mm in diam., with large thick underground fusiform roots. Leaves opposite, lanceolate 90-100 mm long, 10 mm wide, slightly undulate, usually with 4 pairs of lateral veins. Flowers pale yellow to cream with reddish upper throat entrance; corolla tube cylindrical, 18mm long; limb  $\pm$  25 mm in diam., up to 6 $\times$  the diam. of the throat; lobes subequal, oblate. Fruit usually rotund to circular in lateral view, 28 mm long, 25 mm wide; beak indistinct, 1 mm wide; wings of the two sides of the fruit not contiguous at the base of the fruit, hence base distinctly cordate. Seeds 2 in each locule (Fig. 11).

*Pterodiscus angolensis* appears to be most closely related to *P. aurantiacus* (Figs 6, 7 and 15). Both species have a swollen above ground caudex, and thick fusiform roots. The above ground caudex in *P. angolensis* is however smaller than and not as prominent as that for *P. aurantiacus* (Fig. 15). The fusiform roots of *P. angolensis* are however far more prominent and thicker than *P. aurantiacus*. However, the two species also differ in several floral and fruit features (Figs. 5, 8, 9, 10 and 11, Table 1). The flowers of *P. angolensis* are pale yellow to cream (Fig. 5), whilst those of *P. aurantiacus* are bright orange (Fig. 4). *P. angolensis* has mature fruit that are significantly smaller than those of *P. aurantiacus* with a far smaller seed capsule but has significant longer pedicels than *P. aurantiacus* (Figs. 8, 10 and 11). Diagnostic features to dis-

tinguish among *P. angolensis* and *P. aurantiacus* are provided in Table 1.

*Pterodiscus angolensis* is only known from the type locality near Chapreau Armando, Angola. The small, procumbent *Pterodiscus angolensis* was collected on 14 January 2013 by both Ernst Specks and Petr Pavelka. The plants were growing on a small windblown ridge in a sandy soil between rocks of granite inland from the sea at 480 m above sea level. The area also appears to be rich in limestone. The vegetation in the general area consists of low growing hardy shrubs and a few *Sterculia* plants and small dwarf *Commifera* species like *C. saxicola*. Succulents in this low rainfall which probably receives around 100 mm precipitation per year include *Adenium boehmianum*, *Euphorbia subsalsa*, *Fockea angustifolia*, *Hoodia currorii* and *H. mossamendensis*, *Tavaresia angolensis*,

*Huernia oculata*, *Stapelia kwebensis*, *Kalanchoe* sp. and a *Portulaca* sp. The dwarf vegetation is then due to the low rainfall and the procumbent annual stems almost touch the soil of the *Pterodiscus angolensis*. This is probably an adaptation to escape the effects of the prevailing dry winds.

During the 2015 season, seed of this species was sown in spring in August 2015 in the germination hothouse and the seedlings grew out for a few months before being planted out into the large hothouse. They started producing double sets of flower buds from each node in March 2016. This is also typical of the other related species mentioned. The flowers were pollinated by what was seen to be ants and solitary wasps. The pollinated flowers then produced the seed capsules as depicted in Fig. 8.



Figure 3. Habitat photo of *P. angolensis* between granite rocks at type locality.





Figure 4. Striking orange flower of *P. aurantiacus*.



Figure 5. Twin flowers at a node for *P. angolensis*.





Figure 6. Cut-away view of the two species flowers showing far broader corolla tube of *P. aurantiacus*.



Figure 7. Larger orange flower of *P. aurantiacus* on left and smaller less hairy flower of *P. angolensis* on right.



Figure 8. Decumbent nature and herringbone alignment of leaves and long pedicels of *P. angolensis*.



Figure 9. Leaf of *P. aurantiacus* above and *P. angolensis* below showing more linear leaf form.



Figure 10. Larger seed capsule of *P. aurantiacus* on right and smaller darker seed capsule with smaller seed housing of *P. angolensis* on left.



Figure 11. *P. aurantiacus* larger seed on left and smaller seed of *P. angolensis* on right.



Figure 12. Seedlings of *P. angolensis*.





Figure 13. *P. angolensis* in a wilted condition showing blue green curled up leaves and decumbent growth form on 14 January 2013 at type locality.



Figure 14. Typical habitat near the type locality with *Commifera* sp. and other drought-resistant plants.



Table 1	<i>P. aurantiacus</i>	<i>P. angolensis</i>
Distribution	Namibia, Angola	Angola
Plant form	Swollen caudex aboveground, with thick fusiform roots, multiple upright deciduous stems	Mostly geophytic, thick fusiform roots and a swollen smooth caudex aboveground, single to multiple creeping decumbent deciduous stems
Leaves	Bright green; opposite, simple, margin horizontally undulate, up to 70 x 25 mm long, leaf tip sub obtuse	Light green to grey green, opposite, simple, lanceolate with slightly wavy margin, up to 90 x 10 mm long. Leaves orientate themselves flat on the soil in a herringbone pattern, gradually becoming smaller towards the apex.
Fruit	35 x 35 mm Wings robust, beige coloured	Up to 28 x 25 mm Wings very delicate and membranous, reddish brown
Seed	5 x 1.5 mm 4 per fruit	4 x 1.2 mm 4 per fruit
Pedicels	5 mm	10 mm
Flower colour	Bright orange, with purple upper throat entrance	Light yellow to cream, with reddish upper throat entrance
Hairs on corolla lobes	Tube opening fringed with dark hairs; conspicuous white hairs over rest of corolla lobes	Almost glabrous but having hairs at tube opening
Length of corolla tube	18 mm	18 mm
Length of free corolla petals	10 mm	8 mm
Diameter of corolla tube halfway up tube	9 mm	6 mm
Length of style	15 mm	12 mm
Position of stigma in relation to tube length	80%	70%
Diameter of corolla tube entrance	5 mm	4 mm
Raised landing area	Present	Present
Attachment of the stamens to the corolla tube above ovary	1mm	1mm



Figure 15. Plant of *P. angolensis* on the left with small aboveground caudex compared to *P. aurantiacus* on the right.

## References

- HARDY, D.S. 1988. *Pterodiscus aurantiacus*: a case of mistaken identity. *Aloe* 25: 27.
- PECKOVER, R.G. 2016. Two new species of *Pterodiscus* (Pedaliaceae) from southern Africa. *Aloe* 53(1): 10–14.

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