

A distinctive new species of *Pterodiscus* (Pedaliaceae) from Ethiopia

Ralph G Peckover

A new species, *Pterodiscus somanei* is described from Ethiopia. Photographs by the author.

Introduction

Pterodiscus is a genus poorly represented in Ethiopia and only *P. somanei* and *P. ruspolii* are known from this country. In other north-eastern African countries there are three species, *P. kellerianus*, *P. ruspolii* and *P. angustifolius*. Further south there are six species for the Flora of Southern Africa (FSA) region (South Africa, Namibia, Botswana, Lesotho, and Swaziland) (Peckover, 2016; Van Jaarsveld & Van Wyk, 2007; Hardy, 1988; Hargreaves, 1993).

Members of *Pterodiscus* are characterised by leaves that are opposite, sub-succulent and elongated, with wavy or sinuate to dentate margins. They are bright green to greyish green, and when the surface is crushed, exude 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 located a pair of prominent, often dark-coloured glands (extrafloral nectaries). These nectaries attract ants, presumably for protection, although in cultivated plants they appear also to 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



Fig. 2 A large 10-year-old plant of *P. somanei* in cultivation



Fig. 3 (above) Flowers of *P. somanei* depicting the dark purple centre and white petals



under hot sunny conditions. If 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

Fig. 1 Map showing location area of *P. somanei*



Fig. 4 Flowers of *P. ruspolii* with the usual yellow flowers



Fig. 5 Flowers of *P. ruspolii* but with a pinkish tinge



Fig. 6 Flowers of *P. kellerianus*

species, a landing area for visiting pollinators. This 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 to enable pollination.

The indehiscent four-winged fruits, after which the genus is named (Greek *pteron* = wing and Latin *discus* = disc), develop shortly after fertilisation of the ovules and enlarge rapidly. When mature, and often while still green in colour, these fruits are easily dislodged and dispersed by the wind. The seeds of the north-east African species *P. ruspolii* and *P. kellerianus* number up to 20 per fruit (10 in each of the two locules) but *P. angustifolius* has only four seeds per fruit and very reduced wings. These counts are based on observations of *in situ* as well as cultivated plants. The seeds display various degrees of dormancy and usually relatively few will germinate in the first season after shedding of the fruit.

From a cursory survey of the literature, it appears that *Pterodiscus* is used by humans only in Botswana, for a variety of conditions including high blood pressure, cramps, rheumatism as well as for malnutrition when used in association with milk (Danley, 2006; Setshogo & Mbereki, 2011). No material of this genus has been noticed on the occasions when the author visited the large traditional medicinal (Muti) market in downtown Johannesburg. However, members of the closely related genus *Harpagophytum*, in particular the root tubers of *H. procumbens* and *H. zeyheri* (devil's claw), are used extensively in traditional medicine as an anti-inflammatory. From correspondence with Mr Somane, this newly described species is not used for any purpose by humans in the area of distribution.

P. somanei is a rare species known only from the dry flat plains in the area in southern Ethiopia (just north of Somalia) near Hargele. Its nearest relative is *P. ruspolii*, from which it is easily distinguished by its white flowers and rough scaly above-ground caudex.

Taxonomic treatment

Pterodiscus somanei Peckover, **sp. nov.** resembles *P. ruspolii* in having seed capsules with numerous seeds but is easily distinguished from that species by having a distinctive large above-ground caudex, thin almost fibrous roots, flowers being whitish with a purple throat, and several other floral features.

TYPE: Ethiopia, near Hargele, 19 November 2006, Peckover 289 (holotype: PRU).

Description

Plant a perennial herb up to 150mm high; branching or single-stemmed large swollen caudex with a rough brown epidermis, 50–60mm in diameter, with thin



Fig. 7 Flowers cut longitudinally showing placement of style and stamens of a) *P. somanei*, b) *P. ruspolii*, c) *P. kellerianus*



Fig. 8 Seed pods (left to right) of *P. somanei*, *P. ruspolii* and *P. kellerianus*



Fig. 9 Seed (left to right) of *P. somanei*, *P. ruspolii* and *P. kellerianus*

underground roots. **Leaves** opposite, ovate up to 50mm long, 30mm wide, slightly undulate, usually with 4 pairs of lateral veins. **Flowers** white with a purple tube having purple veins leading to the entrance; corolla tube cylindrical, up to 30mm long; limb \pm 29mm in diameter, up to 4 \times the diameter of the throat; lobes subequal, oblate. **Fruit** usually rotund to circular in lateral view, up to 38mm long, 27mm wide; beak indistinct, 1mm wide; wings of the two sides of the fruit not contiguous at the base of the fruit, hence base distinctly cordate (Fig. 8). **Seeds** up to 11 in each locule.

Pterodiscus somanei (Fig. 2) appears to be most closely related to *P. ruspolii* (Figs. 4 & 5). Both species have leaves which are similar in shape as are their multi-seeded locules. The above-ground caudex in *P. somanei* is unique for this north-eastern African species and somewhat resembles *P. luridus* and *P. makatiniensis* from South Africa which both have robust above-ground caudexes. The thin roots of *P. somanei* are however also unique for *Pterodiscus* and no other species displays this characteristic. The flowers of *P. somanei* being almost white with a purple centre (Fig. 3) are unique as no other species has this colour combination. Diagnostic features to distinguish among *P. somanei*, *P. ruspolii* and *P. kellerianus* (Fig. 6) are provided in Table 1.

Pterodiscus somanei is known only from the type locality near Hargele in southern Ethiopia. This unique species was collected in November 2006 by Ernst Specks and Abdirashid Salah Somane, the species being named in honour of the latter. The plants were growing on a dry plain almost devoid of vegetation except for a few *Aloe* sp. and a *Commiphora* sp. next to the track along which they were travelling. From information obtained, this area has very low rainfall and very high temperatures in summer, resulting in the compact growth form of this species.



Fig. 10 Newly germinated seedlings showing round-shaped cotyledons

Table 1 Comparison of diagnostic features of *P. somanei*, *P. ruspolii* and *P. kellerianus*

	<i>P. somanei</i>	<i>P. ruspolii</i>	<i>P. kellerianus</i>
Distribution	Ethiopia	Ethiopia, Sudan and Somalia	Somalia
Plant form	Thick caudex above, rough brown epidermis, thin fusiform roots. Numerous upright to suberect deceduous stems	Geophyte, thick single or splitting root. Few to numerous erect to suberect deceduous stems	Geophyte, thick single or splitting root. Few suberect to decumbent deceduous stems
Leaves	Light green above and below, ovate, entire slightly wavy margin, up to 50×30mm long, leaves becoming smaller towards the apex.	Light green above greyish green below, ovate, entire margin, up to 50×30mm long	Greyish green thin and sharply pinnatifid margin
Fruit size breadth x length	Up to 38×27mm	Up to 32×32mm	Up to 15×18mm
Number of seeds/fruit	Up to 22	Up to 20	Up to 16
Seed colour and characteristics	Brown and having a rough surface, edge very rough and a pointed hypocotyl end	Black and having a smoother surface, edge smooth and very pointed hypocotyl end	Black and having a very rough surface, edge rough and almost rhomboid in shape
Flower colour	Lobes white with purple tube entrance, thin purple veins leading to the entrance	Yellow with a red upper area to tube entrance and inside	Lobes salmon pink with wine-red entrance, thin wine-red veins leading to the entrance
Hairs on corolla lobes	Completely glabrous except inside the corolla tube, short	Fine hairs all over the lobes as well as in the corolla tube , up to 1mm long	No hairs on lobes but only at beginning of tube entrance, long 2mm white
Length of corolla tube	Up to 30mm	Up to 30mm	Up to 25mm
Length of free corolla petals	10–12mm	Main 17mm and others 10mm	8mm
Diameter of corolla tube halfway up tube	5mm	6mm	5mm
Length of style	10mm	15-20mm	12mm
Position of stigma in relation to tube length	33%	33–50%	75%
Diameter of corolla tube entrance	8mm	8mm	5mm
Raised landing area	Yes, with many hairs	Hardly visible	Yes, glabrous
Attachment of the stamens to the corolla tube above ovary	0mm	1mm	2mm

Seed of this species when sown in the germination hothouse germinate but are very small (Fig. 10) when compared with other species and also very susceptible to rot. Being from such an arid area this might be expected.

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Ralph G Peckover
 P.O. Box 910-1083, Pyramid, 0120, South Africa
 Email: brachy@vodamail.co.za
 Layout by Alice Vanden Bon