

## HYACINTHACEAE

### A NEW SUBSPECIES OF *PSEUDOPROSPERO FIRMIFOLIUM* (HYACINTHOIDEAE) FROM KWAZULU-NATAL

The monospecific South African *Pseudoprospero* Speta was treated until recently along with other blue- or mauve-flowered Hyacinthoideae with  $\pm$  free or shortly united tepals in the very broadly circumscribed genus *Scilla* L. The bulk of the sub-Saharan species were later transferred to the genus *Ledebouria* Roth (Jessop 1970), and the remaining species have now been removed to the genera *Merwillia* Speta, *Pseudoprospero* Speta and *Schizocarphus* Van der Merwe (Speta 1998) following the application of molecular techniques in conjunction with morphological and karyological studies. A recent phylogenetic analysis of the family based on the plastid genome (Manning *et al.* 2004) placed *Merwillia* and *Schizocarphus* within a monophyletic sub-Saharan clade of subfamily Hyacinthoideae but the position of *Pseudoprospero* was incompletely resolved as one element of a trichotomy which included the sub-Saharan tribe Massonieae Baker and the Eurasian tribe Hyacintheae Dumort. *Pseudoprospero* thus occupies a significant position in the radiation and biogeography of the subfamily, having diverged near the split between the Eurasian and the sub-Saharan taxa. Chemotaxonomic studies of *Pseudoprospero* bulbs from the Grahamstown District (Koorbanally *et al.* 2007) did not reveal any significant new chemical subclasses to reinforce the circumscription of Pseudoprosperae but five novel 3-hydroxy-3-benzyl-4-chromanones were isolated. Subsequent phytochemical investigation of *P. firmifolium* material recently collected around Durban has currently resulted in re-isola-

tion of only two of the five compounds but also a number of other homoisoflavonoids not found in the previous analysis (D.A. Mulholland pers. comm. 2009). These findings in *Pseudoprospero*, in conjunction with the well-documented production of homoisoflavonoids by both the Massonieae and Hyacintheae (Pohl *et al.* 2000), suggest that the capacity of the Hyacinthoideae to synthesize compounds of this class evolved prior to the divergence of the extant tribes.

***Pseudoprospero firmifolium* (Baker) Speta** in Phytton 38: 116 (1998). *Scilla firmifolia* Baker: 7 (1870); Van der Merwe: 296 (1944); Jessop: 241 (1970). Type: South Africa, [Eastern Cape], Albany Div., New Years River, November without year, *MacOwan 461* [K, lecto.!, designated by Jessop: 241 (1970); GRA, iso.!).

Deciduous geophyte. *Bulb* tunicated, clump-forming,  $\pm$  hypogaeal, ovoid or subglobose, 200–400 mm diam.; outer tunics becoming papery and greyish brown from tips otherwise green where exposed, sometimes forming short, loose, papery collar, inner tunics tightly overlapping, whitish. *Leaves* 6–8 in flowering plants, becoming progressively smaller and narrower towards centre, suberect or arching, lanceolate-attenuate, mostly 100–150  $\times$  (2–) 5–12(–16) mm, canaliculate, margins narrowly hyaline and minutely denticulate, bright green and softly leathery when fresh. *Inflorescence* an elongated, lax raceme, simple

or with 1–few short branches from lower bracts, 20–600 mm long, many-flowered; scape suberect or sprawling,  $\pm$  2 mm diam. at base; bracts subulate, membranous at first becoming dry and papery, lowermost up to 10 mm long but usually  $4\text{--}6 \times 0.5\text{--}0.8$  mm, with minute bracteole 1–2 mm long on alternate sides; pedicels suberect, 6–10(–15) mm long. *Flowers* facing upwards, unscented, white flushed pink to lilac with green or brown midrib; tepals biseriate with outer series overlapping inner at base, united basally for  $\pm$  0.5 mm, spreading or slightly recurved from base, narrowly oblong,  $3\text{--}5 \times 1\text{--}2$  mm. *Stamens* adnate to perianth for  $\pm$  1 mm, basally connate, suberect; filaments subulate,  $3.0\text{--}3.5 \times 0.5$  mm, white; anthers  $\pm$  1 mm long at anthesis, reddish to purple; pollen yellow. *Ovary* turbinate, deeply 3-lobed with 2 ovules per locule,  $\pm 1.5 \times 1.5$  mm, either yellowish green with pure white style, or purple with basal half or entire style also purple; style slender and tapering to small terminal stigma, 2.0–2.5 mm long, slightly 3-grooved. *Capsule* turbinate, deeply 3-lobed,  $2.5\text{--}3.0 \times 3\text{--}4$  mm, locules 1-seeded, dehiscing along upper half of suture only. *Seeds* ovoid,  $2.5 \times 2.0$  mm, dark brown, testa closely adhering, papillate-pustulate.

*Pseudoprosero* was until recently considered to be confined to the Eastern Cape, between Alexandria and Umtata (Van der Merwe 1944; Jessop 1970), but the recent discovery of several populations of the species between Durban and the Tugela River in KwaZulu-Natal extends the known range of the species some 300 km to the northeast. Apart from a single early collection of the species from south of Umtata made in the first half of the nineteenth century by J.F. Drège, all other collections of the species are from a small area centred on Grahamstown. The countryside around Umtata has been transformed substantially by grazing over the past century and it is thus not altogether surprising that there are no recent collections from here but it is remarkable that the species has remained undetected for so long around Durban, a region that some (McCracken & McCracken 1990) consider to have been intensively botanized for well over a century. Several reasons probably contribute to the late discovery of the taxon in KwaZulu-Natal, not least the fact that this relatively inconspicuous plant is highly localized. Improved road access into the region has also opened up areas to botanical collectors.

Morphologically, the KwaZulu-Natal populations of *Pseudoprosero* differ in only minor details from the Eastern Cape plants, notably in their generally broader leaves, and most conspicuously, their purple instead of yellowish green ovary. These differences appear to be consistent across the two known sets of populations. Careful searching along the edge of the coastal plateau between Durban and Umtata may yield further populations that connect the two known areas of occurrence but until then the small morphological and possible chemical differences, in combination with the rarity of the species and the apparent disjunction in distribution, provide reasons for distinguishing the KwaZulu-Natal plants as a separate subspecies.

#### Key to subspecies

- 1a Leaves 2–10(–15) mm wide at base; ovary yellowish green, style white ..... subsp. *firmifolium*  
 1b Leaves (4–)6–16 mm wide at base; ovary and style purple ..... subsp. *natalensis*

#### *Pseudoprosero firmifolium* subsp. *firmifolium*

*Distribution and ecology*: thus far known only from the Eastern Cape, mainly between Alicedale and Peddie (especially around Grahamstown), with a single early record by Drège from south of Umtata (Figure 11). The southern collections between Alexandria and Peddie are uniform for flower coloration but these details are not known for the plants from Umtata. This locality lies almost midway between the bulk of the southern collections (representing the typical subspecies) and the northern ones that are treated here as subsp. *natalensis* but we place it provisionally in the typical subspecies on account of its narrow leaves. Plants form colonies among rocks in open savanna, flowering in midsummer between December and March.

#### *Pseudoprosero firmifolium* subsp. *natalensis*

*J.C. Manning*, subsp. nov.

Folia ad basem (4–)6–16 mm lata, ovarium stylisque purpureum.

TYPE.—KwaZulu-Natal: 2930 (Durban): Nyuswa, below Portion 585 of the Farm Assagay Kraal, Botha's Hill, (–DD), 23 December 2007, *Styles 3308* (NH, holo.; K, NBG, NU, MO, PRE, iso.).

*Distribution and ecology*: apparently restricted to a small area of KwaZulu-Natal (Figure 11), where it is known from three localities along the edge of the coastal plateau between the Umgeni (Mgeni) and Tugela (Thukela) River valleys, a distance of  $\pm$  80 km. At the type locality, where the species is most abundant, plants grow in shallow

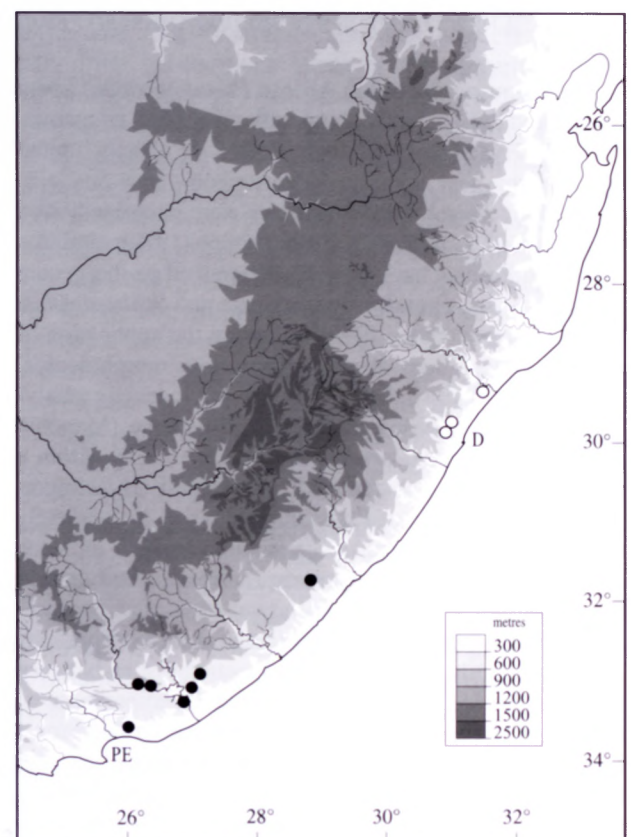


FIGURE 11.—Known distribution of *Pseudoprosero firmifolium* subsp. *firmifolium*, ●; subsp. *natalensis*, ○.

soils fringing exposed granite sheets, whereas at the other localities they occur in soil where the substrate is not rocky. All localities are, however, situated within Eastern Valley Bushveld (Mucina & Rutherford 2006). Plants may occur in exposed situations or in partial shade among trees and shrubs where there is no closed canopy. Flowering takes place in midsummer, from December to February.

Although Eastern Valley Bushveld as a vegetation type is considered Least Threatened by Mucina & Rutherford (2006), all populations of *Pseudoprospero firmifolium* subsp. *natalensis* found to date face some degree of threat. The population at the type locality is threatened by proximate peri-urban sprawl which has already resulted in some degradation of the surrounding vegetation. This is exacerbated by cattle, which trample the thin soils in which the plants grow, and by alien plant invasion. Moreover, a large housing development has been proposed on land above the population, with the potential to greatly increase storm water flows down the granite sheets on which the plants occur.

Plants of the other known population in the Durban area are very localized, occurring within a small area ( $\pm 200 \text{ m}^2$ ) in a fragment of untransformed Eastern Valley Bushveld on the shores of the Inanda Dam. Once one of the largest natural areas left within the city, development of roads in this area has resulted in extensive settlement and ongoing removal of the natural vegetation.

One of the localities, along the south bank of the Tugela River, was subsequently destroyed by construction of a road. Unlike the greater Durban area, where much of the remaining Eastern Valley Bushveld will likely be degraded or transformed in future, there are nonetheless many inaccessible valleys along the Tugela River which are likely to remain as they are for some time to come. It is not unreasonable to assume that other populations could occur in these.

#### *Additional material examined*

##### subsp. *firmifolium*

EASTERN CAPE.—3128 (Umtata): between Morley and Umtata, (–DD), February 1832, *Drège 4492* (K). 3326 (Grahamstown): Alexandria, Bushman's River Poort, (–AC), 5 January 1956, *Archibald 6156* (PRE); Bathurst,  $\frac{1}{2}$  mile [0.8 km] S of Kaffir Drift, (–AC), 21 January 1936, *Dyer 3374* (NBG, NH, PRE); Kaffir Drift, (–AC), 4 February 1970, *Bayliss 25/65* (NBG); near Salem, (–AD), 30 December 1947, *Britten s.n.* (PRE); Howieson's Poort, (–BC), 18 January 2002, *Manning 2701* (NBG); Douglas Heights, (–BC), 22 March 1967, *Bayliss 3978* (NBG); Round Hill, Lower Albany, (–BD), December 1885, *Bolus 2869* (BOL, PRE); Hopewell, (–BD), 28 December 1944, *Acocks 11058* (PRE); Trappes Valley, (–BD), 19 December 1965,

*Bayliss 3081* (NBG); Alexandria, (–CB), 16 February 1943, *Holland s.n. NBG122/32* (NBG); Bathurst, (–DB), January 1957, *Sidley 3067* (PRE). 3327 (Peddie): Line Drift, Peddie, (–AA), December 1900, *Sim 4060* (PRE); Albany District, between Kaffir Drift and Trappes Valley, (–AC), 30 December 1964, *Leach & Bayliss 12631* (PRE).

##### subsp. *natalensis*

KWAZULU-NATAL.—2930 (Pietermaritzburg): close to Inanda Dam, inland of Durban, (–DB), 2005 fl. in cult. 8 January 2007, *Styles 3307* (NH); Botha's Hill, below Portion 585 of the Farm Assagay Kraal, 465 m, (–DA), 14 December 2008, *Crouch 1184* (NH). 2931 (Stanger): Mabhobhane, near Mapumulo, south bank of Tugela River, (–AA), 8 January 2007, *Styles 3306* (NH, NBG, NU).

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