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ASPHODELACEAE: ALOOIDEAE

GASTERIA CROUCHERI SUBSP. *PONDOENSIS*, A NEW CREMNOPHYTE FROM PONDOLAND, SOUTH AFRICA

We describe a new subspecies of *Gasteria croucheri* (Hook.f.) Baker from northern Pondoland, Eastern Cape, an obligate cremnophyte belonging to *Gasteria* Duval sect. *Longiflorae* Haw. ser. *Longifoliae* Haw. The members of this series are all characterized by narrow, elliptical, comparatively dull-coloured flowers in which the swelling in the upper half approximates the rather unpronounced basal gasteriform portion (Van Jaarsveld *et al.* 1994). Mature specimens of the new taxon produce both leaves (up to 1.5 m long) and flowers (up to 50 mm long) that are exceptionally long in the genus. To date, plants have only been found in the Msikaba and Mtentu River systems adjacent to Mkambati Game Reserve (Figure 8), the topography of which is characterized by rugged plateaux of 100–500 m, dissected deeply by narrow river gorges. This distribution falls within the Pondoland Centre of Plant Endemism (Van Wyk & Smith 2001). Specimens grow on cliffs both fully exposed on southern aspects, as well as within the shaded margins of riverine forest. It is a clump-forming species with long, angular and often sickle-shaped leaves, most of which are pendulous in mature specimens (Figure 9).

Gasteria croucheri *(Hook.f.) Baker* subsp. **pondoensis** *N.R.Crouch, Gideon F.Sm. & D.G.A.Styles*, subsp. nov.

A subsp. *croucheri* differt foliis pendulis et a subsp. *pendulifolia* foliis usque ad 1.5 m longis, dum flores sui 50 mm longi longitudines antea in ceteris duabus subspeciebus recognitas excedentes. Subspecies nova ad habitationem specialem in regio geographica speciei restricta.

TYPE.—Eastern Cape, 3130 (Port Edward): rocky ledge alongside Lukabeni stream, 4.5 km upstream of Mtentu River mouth, (–AA), 04-01-2009, *N. Crouch & D. Styles 1149* (NH, holo.).

Plants acaulescent, decumbent to rarely erect, 250–400 mm tall, up to 600 mm diam., solitary, dividing or proliferating from base to form dense groups. *Roots* succulent, up to 6 mm diam. *Leaves* rosulate, erectly spreading, rarely patent or recurved, triangular, linear-lanceolate to falcate, rarely lorate, 200–1 500 mm long, 30–100 mm broad at base; adaxial surface broadly canaliculate, plane towards apex, abaxial surface somewhat convex with a distinctly tuberculate-serrulate excentric keel; both surfaces dark green, often glaucous, with dense white to concolorous spots arranged hap-

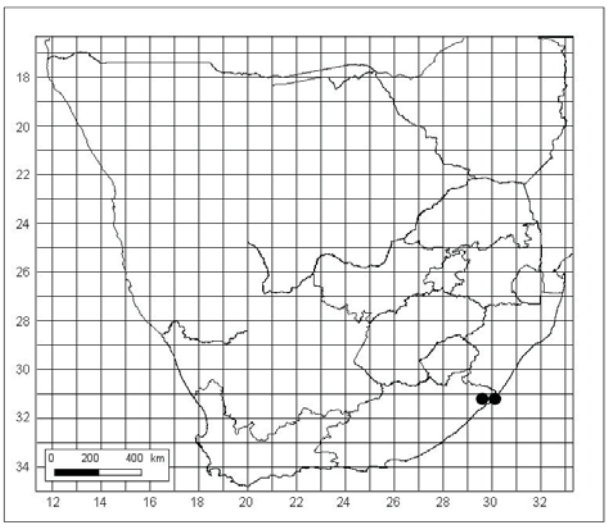

FIGURE 8.—Known distribution of *Gasteria croucheri* subsp. *pondoensis*, ●.

FIGURE 9.—Flowering plant of *Gasteria croucheri* subsp. *pondoensis* along the Lukabeni stream, tributary of Mtentu River, Eastern Cape Province. Photograph: N. Crouch.

hazardly or in transverse bands; surface smooth, rarely slightly asperulous; margin tuberculate-serrulate, rarely denticulate; apex obtuse or acute, mucronate. *Juvenile leaves* distichous, lorate, patent to erectly spreading, smooth; apex acute, rarely obtuse, mucronate. *Inflorescence* racemose, up to 900 mm tall, ascending, at first drooping, with or without a pair of side branches; scape 10–14 mm broad at base, flattened; floral bracts 6–11 mm long, piliferous; pedicel 10–11 mm long, pink. *Perianth* 42–50 mm long, stipitate for up to 9 mm, gasteriform proximally (narrow-elliptic) for half its length; basal gasteriform portion pink, 7 mm wide (often triangular in cross section), upper portion light pink with green striations, inflated to nearly same diam. as basal portion (with slight constriction in middle); apex erect becoming erectly spreading, obtuse; margins of inner segments free and channelled at base for 8–12 mm, diverging gradually towards apex. *Stamens* 33 mm long; anthers 2.5–4.0 mm long, shortly exserted at anthesis. *Ovary* 9–10 × 3 mm; style 17–19 mm long, lengthening considerably during female phase of flower; stigma capitate, included or slightly exserted, curved upwards, minute. *Capsule* 20–22 mm long, obtuse at apex. *Seeds* 3–4 × 2–3 mm. *Flowering time*: December to February.

In the latest revision of *Gasteria* (Van Jaarsveld 1994), over 100 available names (Schelpe 1958) were consolidated to 16 species, with a total of 22 taxa. A subsequent synopsis (Van Jaarsveld 2007) indicated that further research had by that date resulted in the recognition of an additional seven species, bringing the total number of taxa to 34. Included in this revised number were two new taxa described from KwaZulu-Natal, the most recent of which was *G. tukhelensis* Van Jaarsv. from the lower Tukhela River near Kranskop (Van Jaarsveld & Van Wyk 2005). Forms of *G. croucheri* previously referred to as cultivars 'Shongweni' and 'Umgeni' from near Durban (Van Jaarsveld 1994) were also collectively described as *G. pendulifolia* Van Jaarsv. (Van Jaarsveld & Van Wyk 2001), but were subsequently reduced to subspecific rank (*G. croucheri* subsp. *pendulifolia* (Van Jaarsv.) Zonn.) following total nuclear DNA analyses (Zonneveld & Van Jaarsveld 2005). Van Jaarsveld & Van Wyk (2001) considered the distribution range of *G. croucheri* subsp. *pendulifolia* to extend along the subtropical coast, northwards from Durban to just south of Mkuze. Zonneveld & Van Jaarsveld (2005) distinguished *G. croucheri* subsp. *pendulifolia* from the typical subspecies on account of its smaller size, prolific clustering habit, and pendulous leaves that are narrow, glaucous and with an entire margin. The flowers are also predominantly white infused pink basally, whereas those of subsp. *croucheri* are pinker throughout, with more prominent green striations apically. The typical subspecies has been reported as larger, with leaves ascending to spreading, and a lower propensity for cluster-forming (Van Jaarsveld & Van Wyk 2001; Van Jaarsveld 2007). Based on their somewhat broader concept for *G. croucheri* subsp. *croucheri*, Van Jaarsveld & Van Wyk (2001) reported the typical subspecies to occur from Durban southwards to the Msikaba River in the Eastern Cape. Subspecies *croucheri* is presently not known from the Msikaba and Mtentu River gorges, but has been observed beyond the range of subsp. *pondoensis* to as far south as the Mzimvubu River where plants were found on shale cliffs ± 15 km inland of the coast (Van Jaarsveld & Van Wyk 2003). Populations of subsp. *pondoensis* occur towards the southern end of the range of subsp. *croucheri*, and are separated geographically from the similarly pendulous-leaved subsp. *pendulifolia* by a distance of 150 km. The three subspecies of *Gasteria croucheri* are thus allopatric. As stated above, the leaves of subsp. *pondoensis* are often significantly longer than those of both other subspecies, for they may attain lengths of up to 1.5 m. By comparison, those of subsp. *croucheri* are only 0.36 m long, whereas those of subsp. *pendulifolia* are little more than 0.45 m long (Van Jaarsveld & Van Wyk 2001). The perianth size of subsp. *pondoensis* is longer too than both its closest relatives, attaining 50 mm compared to 40 mm; they are similar in colour to subsp. *croucheri*.

Gasteria croucheri subsp. *pondoensis* occurs in a summer rainfall coastal region, where it is associated with Scarp Forest (FOz 5), a vegetation unit which today exists as an archipelago of scattered patches ranging in altitude from near sea level to 600 m (Rutherford *et al.* 2006). This *Gasteria* has, however, not yet been found at altitudes higher than 200 m. Particularly fine specimens may be seen on cliffs at the Superbowl on the Msikaba, and along the Mtentu fringe about 3.5 km upstream of the mouth. Both these two deep gorges have likely provided stable forest refugia for this and other endemic taxa, which have been unable to escape their enclave as a result of susceptibility to, *inter alia*, hot seasonal fires in the surrounding sourveld grasslands (Edwards 2005). *G. croucheri* subsp. *pondoensis* grows on cliff

faces and on rock ledges in dense subtropical vegetation that includes the following shrub and tree species: *Helichrysum populifolium*, *Dracaena aletriformis*, *Encephalartos altensteinii*, *Grewia pondoensis*, *Commiphora harveyi*, *Jubaeopsis caffra*, *Strelitzia nicolai*, and *Tarchonanthus trilobus*. Associated cremnophytic succulents include *Aeollanthus parvifolius*, *Aloe arborescens*, *Bulbine* sp., *Crassula multicava* subsp. *multicava*, *C. orbicularis*, *C. pellucida*, *C. streyi*, *Delosperma* sp., *Ischnolepis natalensis*, *Plectranthus saccatus* subsp. *pondoensis*, *Rhipsalis baccifera* subsp. *mauritiana*, *Senecio medley-woodii* and *S. oxydontus*.

At species level, the Red List status for *Gasteria croucheri* has recently been evaluated as Vulnerable (A2d) (Van Jaarsveld & Raimondo 2009) based on extensive and unsustainable harvesting for the trade in traditional medicine (Crouch *et al.* 2000). For this purpose, subsp. *pondoensis* will undoubtedly be as sought after as its sister taxa. In favour of its conservation, *G. croucheri* subsp. *pondoensis* should find refuge in suitable habitats along both the northern and southern boundaries of the Mkambati Game Reserve.

The subspecific epithet *pondoensis* is a geographic indicator of the presently known distribution of this Pondoland endemic.

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MARCHANTIOPHYTA

NEW LIVERWORT DISTRIBUTION RECORDS IN SOUTH AFRICA

New provincial records of thallose liverworts, identified since the publication of the latest checklist of South African liverworts (Perold 2006) are reported here. The new records are based on specimens in the bryophyte collection of the National Herbarium, Pretoria (PRE). Taxonomy and nomenclature follow Perold (2006). The thallose liverworts of southern Africa were revised by Perold (1999).

1. Asterella wilmsii *(Steph.) S.W.Arnell*

FREE STATE.—2828 (Bethlehem): Fouriesburg, Meiringspoort Nature Park, (–CA), 28°36'19"S, 28°13'46"E, 1 381 m, on soil at edge of pool, 15 July 2001, *M. Koekemoer 2057* (PRE). 2829 (Harrismith): Oliviershoek, Blydschap Farm, stream bank, on rock, (–CA), 17 July 1999, *H.M. Anderson 1424* (PRE).

2. Dumortiera hirsuta *(Sw.) Nees*

FREE STATE.—2828 (Bethlehem): Fouriesburg, Meiringspoort Nature Park, 28°36'19"S, 28°13'46"E, 1 381 m, on soil under rock overhang in moist bog, (–CA), 15 July 2001, *M. Koekemoer 2061* (PRE).

3. Exormotheca pustulosa *Mitt.*

KWAZULU-NATAL.—2929 (Underberg): about 4 km down Sani Pass, 2 956 m, on vertical soil bank at roadside, (–CB), 5 Jan. 2000, *S.M. Perold & M. Koekemoer 4341* (PRE).

NORTHERN CAPE.—2822 (Glen Lyon): ± 51 km N of Griekwastad, Rudisheim Farm, on soil, (–DD), June 1999, *P.M. Burgoyne CH13732* (PRE).

WESTERN CAPE.—3320 (Montagu): just outside Montagu at the arched rock, above outspan, 33°48'32"S, 20°05'55"E, 223 m, on soil,