

Three new species of *Diascia* (Scrophulariaceae) from the Western Cape, South Africa

K.E. STEINER*

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ABSTRACT

Three new annual species of *Diascia* Link & Otto are described from the Western Cape Province of South Africa. *D. collina* is characterized by greyish magenta flowers with two divergent yellow sacs containing oil-secreting trichomes. It is restricted to granite outcrops in the vicinity of Saldanha Bay, from the West Coast National Park and Langebaan north to Vredenburg. *D. pusilla* is closely related to *D. collina*, but differs from that species in having smaller flowers with shorter, $\pm$ parallel sacs, and posticous filaments that lack a protuberance where they bend sharply backwards towards the upper lip. It occurs in grey to whitish sands usually near seasonally moist or wet areas. It has not been found more than 35 km from the coast and ranges from Modderivier, south of Darling, north to Lambert's Bay. *D. appendiculata* is related to *D. diffusa* (Thunb.) Benth. and is characterized by having small, mainly reddish lilac to greyish magenta flowers, two shallow depressions in the corolla tube at the base of the upper lip, and posticous filaments with sterile appendages. It is known from only six localities in the general vicinity of Citrusdal and occurs in fynbos vegetation on lower mountain slopes or flats, in loose alluvial sands derived from Table Mountain Sandstone.

INTRODUCTION

Diascia Link & Otto is a genus of $\pm$ 72 species of annual and perennial herbs endemic to southern Africa. Two sections have been recognized, section *Racemosae* with 27 species and section *Diascia* with about 45 species (Hilliard & Burt 1984; Steiner unpubl.). Section *Racemosae* was revised by Hilliard & Burt (1984) and three additional taxa were described more recently (Steiner 1989, 1999). Section *Diascia* has not been revised since Hiern's (1904) treatment in *Flora capensis*, although many new species have been described in recent years as part of a revisionary study (Steiner 1992a, b, c, d 1995). Section *Diascia* consists solely of annual species, whereas section *Racemosae* is mostly perennial (81 %). Three additional new species in Section *Diascia* from the Western Cape are described here. All descriptions are based on living material collected from the field. Flower colours are based on the *Methuen handbook of colour* (Kornerup & Wanscher 1984). Chromosome counts of these species were reported by Steiner (1996).

Diascia collina K.E.Steiner, sp. nov., *D. pusillae* K.E.Steiner proxima, sed differt corolla grandiore, sacculis corollae grandioribus divergentibus non parallelis, et filamentis posticis protuberantione instructis.

TYPE.—Western Cape, 3318 (Cape Town): Postberg Nature Reserve, Vlaeberg loop road, picnic and view site, $\pm$ 200 m, (–AA), 14 Sept. 1988, Steiner 1816 (NBG, holo.; BOL, E, K, MO, PRE, US, iso.).

Annual herb, rosulate, glabrous, simple or branching from base. *Stems* decumbent, up to 340 mm long, angular, up to 6-sided, ribs 2 or more, sides up to 2 mm wide. *Leaves* simple, alternate, opposite or whorled, petiolate; lamina ovate to obovate, 4–33(–60) $\times$ 3–11(–13) mm, apex rounded to acute or apiculate, base attenuate; mar-

gins lobed to divided, lobes or divisions oblong-ovate to triangular, entire, opposite or subopposite, occasionally alternate, apices rounded to acute or apiculate; petioles up to 37 mm long; cauline leaves progressively smaller upwards. *Flowers* axillary, 1 or 2 open per stem, faintly sweet-scented, nodding in early bud stage; flowering pedicels 20–65 mm long, ascending, dorsiventrally flattened especially where attached to flower, recurving in fruit except for upward curving apical portion. *Calyx* lobes 5, spreading, lanceolate, $\pm$ equal, 3.2–3.6 $\times$ 1.4–1.8 mm, acuminate, the two lower sepals slightly reflexed; margins white-ciliate. *Corolla* bilabiate, 5-lobed, limb 13.3–23.0 $\times$ 14.3–26.0 mm; lobes broadly oblong-obovate, falciform, outer sides longer than inner sides, 4.4–7.1 $\times$ 5.2–5.7(–7.9) mm, apices rounded, bases oblique; lateral lobes broadly obovate, emarginate, 5.4–7.1 $\times$ 5.2–6.8 (–8.3) mm, sides $\pm$ equal; lower lobe obcordate, 6.2–9.7 $\times$ 5.4–8.1(–11.4); upper lobes greyish magenta (14D6) with deep magenta veins or lines at base; other lobes similar in colour but without veining, all with scattered, dark purple, peltate glandular trichomes, especially on inner surface near base; tube shallowly cupped, deep magenta; bisaccate, sacs oblong-ovate, rounded, 4–5 $\times$ 2.0–2.5 mm, mostly yellow, widely diverging, oil-secreting glandular trichomes within; central, stamen-bearing boss oblique, anticous portion 1.1–1.5 mm high, deep magenta, posticous portion 0.3–0.6 mm high, yellow. *Stamens* 4, erect, partly hidden; anticous filaments (twisted at base and appearing posticous) falciform, $\pm$ 3.4–3.6 mm long, bases strongly curved, pubescent, trichomes clavate, purple; posticous filaments geniculate, thickened, 1.9–2.0 mm long, bend with protuberance $\pm$ 1 mm from base, pubescent, trichomes clavate, purple; anthers $\pm$ 0.50–0.80 mm, strongly cohering, grey; pollen orange (fading to yellow in pressed specimens). *Ovary* oblong-ovoid, laterally compressed contrary to septum, 1.6–1.7 $\times$ 1 mm; style $\pm$ 1.6–2.0 mm long, reddish purple, curving forward in distal third; stigma capitate, surrounded by anthers; ovules $\pm$ 35–45. *Capsule* ovoid to oblong-ovoid, 5.1–8.1 $\times$ 3.3–5.8 mm, exceeding sepals at maturity, base oblique. *Seeds* reniform, 1.0–1.2 mm long, dorsal surface ridged, ventral surface with an oblong keyhole-like

* Department of Botany, California Academy of Sciences, 55 Music Concourse Drive, Golden Gate Park, San Francisco, CA 94118, USA. MS. received: 2008-05-29.



FIGURE 1.—*Diascia collina*, Steiner 2219 (NBG). A, habit. B–D, flower: B, C, front and rear views; D, side view partially cut away. E, calyx; F, pistil; G, capsule. H, I, seed: H, ventral view; I, side view. Scale bars: A, 10 mm; B, C, 4 mm; D, E, 1 mm; F, 3 mm; G, 2 mm; H, I, 0.5 mm. Artist: Ellaphie Ward-Hilhorst.

opening formed by extensions of seed coat, long sides of opening bearing a reniform perforation; embryo curved. *Chromosome no.*: $2n = 18$. *Flowering time*: August–September. Figure 1.

Diagnostic features: *Diascia collina* is most similar to *D. pusilla*, but it differs from that species in having a larger corolla ($13.3\text{--}23.0 \times 14.3\text{--}26.0$ mm vs $9.1\text{--}13.5 \times 9.0\text{--}14.3$ mm), longer corolla sacs (4–5 mm vs 2.2–

2.5 mm long) and a protuberance from the posticous filaments where they bend backwards (Figure 1). *D. collina* is also similar to *D. capensis* (L.) Britten, but differs from that species in having stamens that are $\pm$ half the size and backwards-bending, rather than forward-arching. *D. collina* also has a shorter style (1.3–2.0 mm vs 3.5–5.2 mm) that is less curved, and corolla sacs that are strongly divergent, not $\pm$ parallel like those of *D. capensis*.

Etymology: the name refers to the hills of granite where the species occurs.

Distribution and habitat: *Diascia collina* is known only from the Postberg section of the West Coast National Park, from undeveloped areas in and around the town of Langebaan directly across the lagoon from Postberg, and from the granite outcrops on the southern edge of Vredenburg (Figure 2). It ranges in elevation from near sea level to about 200 m. In Postberg, *D. collina* is fairly common around the Uitkyk picnic area on Vlaeberg ridge overlooking Langebaan Lagoon. It has also been seen near the entrance to the SADF restricted area at the northwest end of the Postberg Reserve. *D. collina* occurs under and around medium to large shrubs and can be considered endemic to Saldanha Granite Strandveld vegetation (Mucina & Rutherford 2006). In Langebaan and Vredenburg, this habitat is quickly disappearing due to residential expansion.

Pollination and breeding system: based on observations of cultivated plants, *Diascia collina* is self-incompatible and, at Postberg, it is pollinated by two species of oil-collecting bees, *Rediviva peringueyi* Friese and *R. aurata* Whitehead & Steiner (Melittidae) (Whitehead & Steiner 2001). These bees use the specially modified setae on their forelegs to collect oil from the paired yellow corolla sacs. The pollen is deposited on the frons or face of the pollinating bees.

Other specimens examined

WESTERN CAPE.—3217 (Saldanha): Vredenburg, new housing development at Witklip near old granite quarry (S32° 55.228' E17° 58.700'), $\pm$ 150 m, (–DD), 16 Sept. 2004, *Steiner 4101* (CAS); *ibid.*, 2 Sept. 2005, *Steiner 4121* (CAS, K, NBG, PRE, US). 3318 (Cape Town): Postberg Nature Reserve, Vlaeberg loop road, picnic and view site, (–AA), 5 Sept. 1990, *Steiner 2219* (NBG). Langebaan Hill, sandy slopes, (–AA), 24 Aug. 1995, *Goldblatt & Manning 10280* (NBG); *ibid.*, 25 Sept. 1995, *Goldblatt & Manning 10321* (NBG); Langebaan, rocky outcrop near town, (–AA), 23 Aug. 1998, *Goldblatt & Manning 10994* (NBG); Langebaan hills, above town, in vacant lot opposite 82 Sunbird Lane (S 33°06.172' E 18°02.574'), $\pm$ 18 m, (–AA), 30 Aug. 2001, *Steiner 3697* (NBG, CAS); Langebaan, between day care centre and Pikkieland fun park, (S33°05.461' E18°02.207'), $\pm$ 5 m, (–AA), 6 Sept. 2002, *Steiner 3870* (NBG, CAS).

***Diascia pusilla* K.E.Steiner, sp. nov., *D. collinae* K.E.Steiner proxima, sed differt corolla brevior, sacculis corollae parallelis non divergentibus et filamentis posticis sine protuberantibus.**

TYPE.—Western Cape, 3218 (Clanwilliam): Farm Droogerivier, road 365, 8.6 km N of turnoff to Alexandershoek, $\pm$ 200 m west of road, (–BC), 16 Sept. 1988, *Steiner 1819* (NBG, holo.; K, MO, PRE, iso.).

Annual herb, rosulate, glabrous, simple or branching from base. *Stems* decumbent, up to 150 mm long,

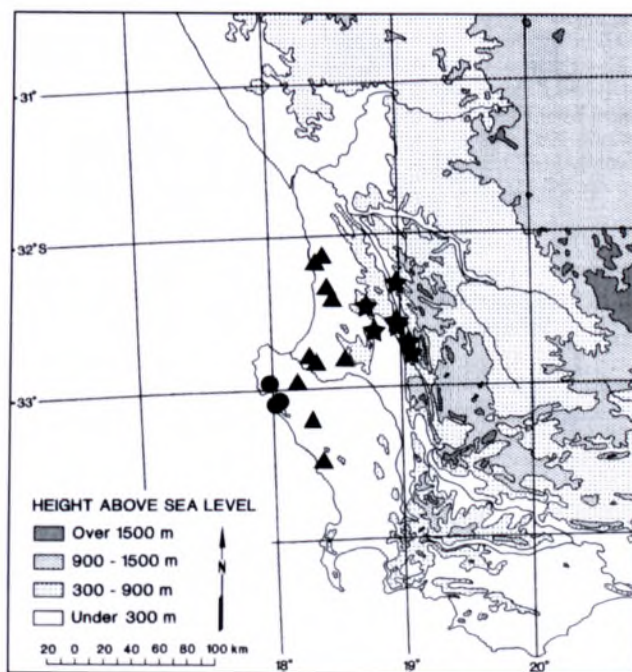


FIGURE 2.—Known distributions of *Diascia collina*, ●; *D. pusilla*, ▲; and *D. appendiculata*, ★.

angular, up to 6-sided, ribs 2 or more, sides up to 2 mm wide. *Leaves* simple, opposite or alternate, petiolate; lamina obovate to elliptic, 5–28 $\times$ 2–9 mm, apex acute to apiculate, base attenuate; margins lobed to divided, lobes or divisions ovate to triangular, entire, acute to apiculate; petioles up to $\pm$ 12 mm long; cauline leaves progressively smaller upwards. *Flowers* axillary, 1 to 3 open per branch, unscented; pedicels 17–23 mm long, ascending, dorsiventrally flattened especially where attached to flower, recurved in fruit except for upward curving apical portion. *Calyx* lobes 5, spreading, lanceolate, $\pm$ equal, 2.3–2.9 $\times$ 1.0–1.2 mm, acuminate; margins white-ciliate. *Corolla* bilabiate, 5-lobed, limb 9.1–13.5 $\times$ 9.0–14.3 mm; lobes broadly ovate; upper lobes 2.6–3.5 $\times$ 2.9–4.0 mm, outer sides longer than inner sides, apices rounded to emarginate, bases oblique; lateral lobes 2.5–3.5 $\times$ 3.0–3.5 mm, sides $\pm$ equal, apices rounded; lower lobe 3.3–5.0 $\times$ 3.2–5.8 mm, emarginate to obcordate; upper lobes greyish magenta (14D6) on inner surface, pinkish white (13A2) on reverse side, with deep magenta (14E8) lines at base; other lobes similar in colour but lacking lines, sparsely glandular puberulous with dark violet, glandular trichomes, especially on inner surface near base; tube shallowly cupped, deep magenta and yellow, bisaccate, sacs ovate in outline, 2.2–2.5 $\times$ 1.2–1.4 mm, projecting downward and diverging slightly at tips, yellow, oil-secreting glandular trichomes within; central stamen-bearing boss oblique, anticous portion 1.2–1.9 mm high, deep magenta (14E8), posticous portion 0.3–0.5 mm high, yellow. *Stamens* 4, erect, partly hidden; anticous filaments (twisted at base and appearing posticous) falciform, 3.0–3.2 mm long, bases strongly curved, sparsely pubescent, trichomes clavate; posticous filaments geniculate, thickened, 2.0–2.5 mm long, bend pubescent, trichomes clavate, dark violet, apical portions, below anthers, bent forward without enlargement; all filaments greyish magenta (13E6) except



FIGURE 3.—*Diascia pusilla*, Steiner 1819 (NBG). A, habit. B–D, flower: B, C, front and rear views; D, side view partially cut away. E, calyx; F, pistil; G, capsule. H, I, seed: H, ventral view; I, side view. Scale bars: A, 10 mm; B, C, 5 mm; D, 2 mm; E, 3 mm; F, 1 mm; G, 2 mm; H, I, 0.5 mm. Artist: Ellaphie Ward-Hilhorst.

just below anthers; anthers 0.3–0.5 mm long, strongly cohering, grey; pollen yellow to orange. *Ovary* oblong-ovoid, laterally compressed contrary to septum, 1.2–1.5 × 0.9–1.0 mm; style 1.3–1.5 mm long, curving forward at tip; stigma subcapitate, surrounded by anthers;

ovules ± 23–38. *Capsule* falciform ovoid, 6.0–7.1 × 3.5–4.6 mm, ± twice as long as calyx at maturity. *Seeds* reniform, 0.9–1.2 mm long, dorsal surface ridged, ventral surface with an oblong, keyhole-like opening formed by extensions of seed coat, long sides of open-

ing bearing a reniform perforation; embryo curved. *Chromosome no.*: $2n = 18$. *Flowering time*: August–September. Figure 3.

Diagnostic features: *Diascia pusilla* differs from its nearest relative, *D. collina*, in corolla size, shape of the posticous filaments, size and shape of the corolla sacs, and habitat. The difference in flower size between the two taxa is not simply a function of plant vigour, since small plants of *D. collina* at Postberg, with only a few leaves, have much larger flowers than robust plants of *D. pusilla*, with many large leaves and long thick stems, at Droogerivier. Corolla limb length of *D. pusilla* reaches 13.5 mm, but averages 11.5 mm, whereas limb length of *D. collina* ranges from 13.3 to 23 mm, but averages 17 mm. The corolla sacs of *D. pusilla* are about half the size of *D. collina* sacs (2.1 mm vs 4.4 mm long) and are parallel or only slightly divergent near the tips. They are not strongly divergent like those of *D. collina*. The shapes of the filaments also differ between these two species. *D. pusilla* lacks the protuberance on each posticous filament that is present in *D. collina*.

Etymology: the name refers to the small size of the flowers.

Distribution and habitat: *Diascia pusilla* is known from a narrow strip along the Cape west coast, from the Farm Modderivier (Mud River) (southwest of Darling), north to Lambert's Bay and as far east as Droogerivier (± 4.5 km SE of Sandberg). It occurs no more than 35 km from the sea and ranges in elevation from sea level to nearly 100 m (Figure 2). On the farms Droogerivier and Suurfontein (near Lambert's Bay), it occurs in or near riverine or vlei systems, often in poorly drained, seasonally wet sands, but in other localities, the habitat is drier. In all cases, it occurs in loose white to greyish sands. Southwest of Darling it has been reported from short fynbos in deep sand (Hugo 2427). It does not occur in areas with granitic outcrops, typical of *D. collina*.

Pollination and breeding system: like most *Diascia* species, *D. pusilla* has oil-secreting glands in its corolla sacs. Unlike *D. collina*, this species is facultatively autogamous and, therefore, does not need visits by oil-collecting bees to set seed. At the type locality, and at least one other locality, *D. pusilla* occurs and flowers concurrently with *Hemimeris racemosa* (Scrophulariaceae), another oil-secreting species. Since at both these sites oil-collecting bees have been caught on *H. racemosa*, it is probable that these same bees visit *D. pusilla*. At the type locality, Droogerivier, and at Kersefontein, *D. pusilla* occurs with *Rediviva parva* (Whitehead & Steiner 2001).

Other specimens examined

WESTERN CAPE.—3218 (Clanwilliam): Farm Suurfontein (± 13 km E of Lambert's Bay), 6.8 km E of turnoff to Doringbaai (S32°07'209" E18°25'710"), ± 50 m, (–AB), 4 Sept. 2001, Steiner 3718 (CAS, NBG); Farm Wagendrift, 12.1 km S of Lambert's Bay, ± 5 m, (–AB), 12 Sept. 1991, Steiner 2386 (NBG); Elandsbaai–Redelinghuys rd, 8.9 km NW of Redelinghuys turnoff, ± 40 m, (–AD), 14 Sept. 1984, Steiner 775 (NBG); *ibid.*, 19 Sept. 1988, Steiner 1822 (NBG); Farm Droogerivier, Road 365, 8.6 km N of turnoff to Alexandershoek, ± 200 m west of road, (–BC), 14 Aug. 1987, Steiner 1570 (NBG); *ibid.*, 19 Aug. 1993, Steiner 2663 (NBG); Langebaanweg, (–CC), 13 Sept. 1991, Goldblatt & Manning 9207 (NBG); Farm Kersefontein, 5.9 km N of

Berg River, ± 20 m, (–CD), 17 Sept. 1991, Whitehead 1 (NBG); Farm Doornfontein A, ± 30 m, (–CD), 9 Sept. 1994, Steiner 2886 (NBG); Farm Suurfontein, 0.7 km W of Sauer Post Office, ± 30 m, (–DC), 10 Sept. 1990, Steiner 2226 (NBG). 3318 (Cape Town): Farm Baarhuis (NW of Darling), 0.5 km N of entrance to Farm Skilpadfontein, (S33° 14.769' E18° 18.334'), ± 65 m, (–AB), 16 Sept. 2005, Steiner 4168 (CAS, NBG); Farm Modderivier, southwest of Darling along new National Road, ± 80 m, (–AD), July 1980, Hugo 2427 (PRE).

***Diascia appendiculata* K.E.Steiner, sp. nov., *D. diffusae* (Thunb.) Benth. proxima**, sed differt floribus brevioribus, sacculis corollae destituti, staminibus erectis nec patentibus et filamentis glabratis.

TYPE.—Western Cape, 3218 (Clanwilliam): Grey's Pass (Modderfontein), 4.2 km N of turnoff to Paleisheuwel, ± 290 m, (–DB), 9 Sept. 1989, Steiner 1978 (NBG, holo.; CAS, K, MO, PRE, US, iso.).

Annual herb, rosulate, glabrous, simple or branching from base. *Stems* decumbent, up to 220 mm long, angular, up to 6-sided, ribs 2 or more, sides up to 2 mm wide. *Leaves* simple, alternate, opposite or whorled, petiolate, erect or spreading; lamina mostly oblong, but also ovate to obovate, 9–35 $\times$ 3–9 mm, apex acute to rounded, base attenuate; margins sinuate, pinnatifid or pinnatisect, lobes up to ± 5 mm long, ovate, obovate, oblong or deltoid, apices rounded to acute; petioles up to ± 15 mm long; cauline leaves progressively smaller upwards. *Flowers* axillary, 1 or 2 open flowers per stem, nodding in bud, long pedicelate; pedicels 17–53 mm long, ascending, dorsiventrally flattened especially where attached to flower, elongating and spreading at right angles to stem in fruit, with an abrupt downward curve 3–4 mm from base of developing capsule. *Calyx* lobes 5, spreading, lanceolate, acuminate, margins white-ciliate, upper 3 segments $\pm$ equal, 2.4–3.1 $\times$ 1.0–1.6 mm, lower 2 segments slightly wider. *Corolla* bilabiate, 5-lobed, limb 7.4–14.3 $\times$ 7.7–14.8 mm; upper lobes ovate to obovate, 2.0–4.7 $\times$ 2.5–5.2 mm, outer sides longer than inner sides, apices rounded to emarginate, bases oblique; lateral lobes oblong-ovate, 2.5–4.6 $\times$ 2.8–4.6 mm, sides $\pm$ equal in length, apices rounded to emarginate, lower lobe obcordate, 3.1–5.0 $\times$ 3.6–6.4 mm, all lobes reddish lilac (14C4) to greyish magenta (14D6) on inner surface and violet-white to purplish white on reverse side, with scattered black or clear glandular trichomes on both sides; tube shallowly cupped, dark ruby to violet-brown, very shallowly bisaccate, sacs or depressions 0.3–1.0 $\times$ 1.0–1.6 mm, 0.5–0.7 mm deep, yellow, oil-secreting trichomes clustered within; central stamen-bearing boss oblique, sparsely glandular pubescent, antecous portion 0.5–1.0 mm high, ruby, posticous portion ± 2.0 mm high, yellow. *Stamens* 4, erect from the boss; filaments ruby, usually glabrous, occasionally covered with dark purple, clavate trichomes; antecous filaments (twisted at the base and appearing posticous) $\pm$ straight, 2.1–2.5 mm long, base strongly curved; posticous filaments ± 2.3 mm long, with sterile appendages, ± 0.8 mm from base, appendages 0.1–0.8 mm long, sometimes reduced in length to a small nub, filament above bend ± 1.5 mm long; anthers 0.3 mm long, strongly cohering, greenish yellow; pollen orange. *Ovary* ovoid, laterally compressed contrary to septum, 1.2–1.5 $\times$ 0.8–1.1 mm, falciform; ovules 27–47; style ± 1.2 mm long,



FIGURE 4.—*Diascia appendiculata*, Steiner 1978 (NBG). A, habit. B–D, flower: B, C, front and rear views; D, side view partially cut away. E, pistil; F, capsule; G, calyx. H, I, seed: H, ventral view; I, side view. Scale bars: A, 10 mm; B, C, 3 mm; D, E, 1 mm; F, 1 mm; G, 4 mm; H, I, 1 mm. Artist: Ellaphie Ward-Hilhorst.

deflected upwards, ± straight or curved forward near tip; stigma capitate, surrounded by anthers or emerging slightly. *Capsule* falciform ovoid, (5.0–)6.4–7.5 × (2.5–)4.0–5.0 mm, about twice as long as calyx at maturity, base

oblique, often resting on soil surface during development with pedicel ascending just before dehiscence. *Seeds* reniform, 1.3–1.5 mm long, dorsal surface with parallel ridges, ventral surface with oblong keyhole-like opening formed

by extensions of seed coat, long sides of opening bearing reniform perforation; embryo curved. *Chromosome no.*: $2n = 18$. *Flowering time*: August–September.

Diagnostic features: *Diascia appendiculata* is most closely allied to *D. diffusa*. Both species have posticous filaments with sterile appendages, but the stamens are erect in *D. appendiculata* and projecting forward in *D. diffusa*. Furthermore, the filaments in *D. appendiculata* are usually glabrous, whereas those of *D. diffusa* have clavate trichomes. Both species also have two localized patches of oil-secreting trichomes, but in *D. diffusa* they are clustered in two short, but distinct, spurs (at the base of the upper corolla lip), whereas in *D. appendiculata* they are present in two shallow, yellow depressions that may or may not be visible on the outside of the corolla as a slight swelling of the tube.

Etymology: the name refers to the filament appendages.

Distribution and habitat: *Diascia appendiculata* is known from only six localities in the general vicinity of Citrusdal (Figure 2). It occurs between elevations of 100 to 300 m in fynbos vegetation on lower mountain slopes or flats in loose alluvial sands derived from Table Mountain Sandstone. In five of the localities it occurred on first year burns, while in the other locality it was collected from a roadside area next to cultivated land at the northeastern base of the Piketberg. On Grey's Pass, it was most abundant in the first season after fire, but was also observed in the second and third years (1990, 1991) after fire. It could not be found in the fifth and sixth years. The stimulation of germination in response to fire is also found in other *Diascia* species such as *D. elongata* Benth. and *D. maculata* K.E.Steiner.

Pollination and breeding system: *Diascia appendiculata* is facultatively autogamous. However, because it secretes floral oil, it is probably visited and cross-pollinated, at least occasionally, by small oil-collecting *Rediviva* bees (Melittidae) such as *R. parva* Whitehead & Steiner, *R. intermixta* (Cockerell) or *R. aurata* Whitehead & Steiner (Whitehead & Steiner 2001).

Other specimens examined

WESTERN CAPE.—3218 (Clanwilliam): Farm Swartboskraal, 6.7 km N of turnoff to Citrusdal on Paleisheuvel–Sandberg road, 270 m, (–BC), 22 Aug. 1991, *Steiner 2334* (NBG); *ibid.*, 1.5 km S of farm entrance, 218 m, (–BC), 31 Aug. 2004, *Steiner 4082* (NBG); Farm Krieberg, 7.2 km E of old Clanwilliam–Citrusdal road on road to Algeria, ± 290 m, (–BD), 16 Sept. 1989, *Steiner 2009* (NBG); *ibid.*, 24 Sept. 1989, *Steiner 2025* (NBG); N7, 1.6 km N of turnoff to Citrusdal,

± 280 m, (–DB), 10 Aug. 1998, *Steiner 3287* (NBG); Farm Kanarieberg, Road 366, 5.7 km S of junction with Road 365 to Lambert's Bay, ± 110 m, (–DB), 21 Sept. 1984, *Steiner 776* (NBG). 3219 (Wuppertal): Farm Moddervlei, 13.6 km south of Citrusdal on road to Keerom, ± 210 m, (–CA), 6 Sept. 1991, *Steiner 2357* (NBG); Farm Karmmelsvlei, 19.6 km south of Citrusdal on road to Keerom, ± 250 m, (–CC), 6 Sept. 1991, *Steiner 2362* (NBG).

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