

## Notes on African plants

VARIOUS AUTHORS

### IRIDACEAE

*TRITONIA CEDARMONTANA* AND *T. LINEARIFOLIA* (CROCOIDEAE), TWO NEW SPECIES FROM THE CAPE FLORISTIC REGION; *T. LINEATA* VAR. *PARVIFOLIA* INCLUDED IN *T. GLADIOLARIS*; AND THE CORRECT AUTHOR CITATION FOR *T. STRICTIFOLIA*

#### INTRODUCTION

*Tritonia* Ker Gawl. is a genus of  $\pm 30$  species widely distributed throughout eastern sub-Saharan Africa but concentrated in the South African winter rainfall region (De Vos 1999; Goldblatt & Manning 2008). Its relationships lie with a small group of genera in tribe Ixieae (= Croceae) that includes *Dierama* K.Koch, *Duthieastrum* M.P.de Vos, *Ixia* L. and *Sparaxis* Ker Gawl., all of which have  $\pm$  smooth, shiny, subglobose seeds with an excluded vascular bundle. *Tritonia* is defined within this alliance by its membranous to dry,  $\pm$  translucent floral bracts, with the outer bract often 3-toothed (Goldblatt & Manning 2008), and (with rare exceptions in two species with unusual, succulent leaves) by its anatomically specialized leaves that lack a marginal vein or strand of subepidermal sclerenchyma at the margins, and in which mechanical strengthening is provided instead by narrow, thick-walled marginal epidermal cells (Rudall 1994).

This specialized leaf margin anatomy also characterizes *Duthieastrum* and *Sparaxis* but not the two remaining genera of the alliance, *Dierama* and *Ixia*, which have the plesiomorphic leaf margin anatomy. These two genera have membranous to dry floral bracts, with the outer bracts of *Ixia* also typically 3-toothed and thus similar to those in *Tritonia*. Unlike *Tritonia*, however, both *Dierama* and *Ixia* have actinomorphic flowers borne on  $\pm$  wiry, capillary stems as the plesiomorphic state.

*Tritonia* was thoroughly revised by De Vos (1982, 1983, 1999) and the following two new species are the first to be described since then. *T. cedarmontana* is named for the only known locality of the species in the Cedarberg [the form of the epithet, although a compound of English and Latin, matches that of other species in Iridaceae], and *T. linearifolia* is named for its unusually narrow leaves, most species in the genus having lanceolate leaves. The latter species is undoubtedly a member of sect. *Subcallosae* M.P.de Vos but the relationships of the former are less clear, and our placement of it in the same section is provisional. Collections at BOL, NBG, PRE and SAM, the main herbaria with good representation of collections of Cape species, were consulted for records of the two new species (herbarium acronyms after Holmgren *et al.* 1990).

Recent study of some early types of species of Iridaceae resulted in the identification of *Ixia gladiolaris* Lam. as an earlier name for *Tritonia lineata*, which was accordingly placed in synonymy under the new combination *T. gladiolaris* (Lam.) Goldblatt & J.C.Manning (Goldblatt & Manning 2006). The requisite transfer of *T. lineata* var. *parvifolia* M.P.de Vos to *T. gladiolaris* was

not done at the time. We have subsequently examined material of both varieties and conclude that var. *parvifolia*, which was recognized solely by its shorter leaves, is not worthy of taxonomic recognition, and the name is reduced to synonymy here.

***Tritonia cedarmontana* Goldblatt & J.C.Manning, sp. nov.**

Plantae (50–)150–300 mm altae, cormo conico-globo 7–10 mm diam., tunicis fibris tenuibus reticulatis, caule usitate eramoso, foliis 4–6 omnibus  $\pm$  basilibus usitate 1.5–2.0 mm latis, spica inclinata 2–5-flora, bracteis sicco-membranaceis translucentibus ad apicem brunneomaculatis, bractea externa 3-venosa 4–6 mm longa, interna  $\pm$  aequilonga 2-venosa ad apicem furcata, floribus zygomorphis salmoneo-aurantiacis, tubo perianthii oblique infundibuliformi 9–10 mm longo, tepalis pauciter inaequalibus, tepalo dorsali ovato 13–14  $\times$  7.0–7.5 mm, aliis ellipticis  $\pm$  13  $\times$  5.5–6.5 mm, staminibus unilateralibus arcuatis, filamentis 4–5 mm longis  $\pm$  1 mm exsertis, antheris 3.5–4.0 mm longis, stylo ad apicem antherarum diviso, ramis  $\pm$  3 mm longis.

TYPE.—Western Cape: 3219 (Wuppertal): southern Cedarberg, Krom River Kloof, 4000' [1 220 m], (–CA/CC), 13 Dec. 1950, *Esterhuysen 18009* (BOL, holo.; NBG, PRE, iso.).

Plants (50–)150–300 mm high; corm conical-globose, 7–10 mm diam., tunics of fine, netted fibres, extending in a papery or fibrous neck; stem  $\pm$  erect, usually unbranched, rarely with 1 small branch in axil of a membranous cauline bract enclosed in uppermost leaf sheath. *Leaves* 4–6, all  $\pm$  basal, linear, usually  $\pm$  as long as stem, mostly 1.5–2.0 mm wide, uppermost largely sheathing, usually shorter than others, central vein moderately thickened. *Spike* inclined, 2–5-flowered, moderately lax; bracts dry-membranous, translucent with some brown speckling apically, outer with 3 main veins, shallowly 3-toothed at apex, 4–6 mm long, inner  $\pm$  as long, 2-veined and forked at apex. *Flowers* zygomorphic, salmon-orange; perianth tube obliquely funnel-shaped, 9–10 mm long, lower cylindrical portion 4–5 mm long; tepals slightly unequal, dorsal ovate, 13–14  $\times$  7.0–7.5 mm, other tepals elliptical,  $\pm$  13  $\times$  5.5–6.5 mm. *Stamens* unilateral and arcuate; filaments 4–5 mm long, inserted 5–6 mm within tube thus included  $\pm$  1 mm; anthers 3.5–4.0 mm long, partially included in upper part of tube, yellow. *Ovary*  $\pm$  2 mm long; style arched over stamens, dividing opposite anther tips, branches filiform,  $\pm$  3 mm long. *Immature capsules* subglobose or obovoid, 3-lobed,  $\pm$  4.5 mm diam. *Immature seeds* globose. *Flowering time*: December. Figure 1.

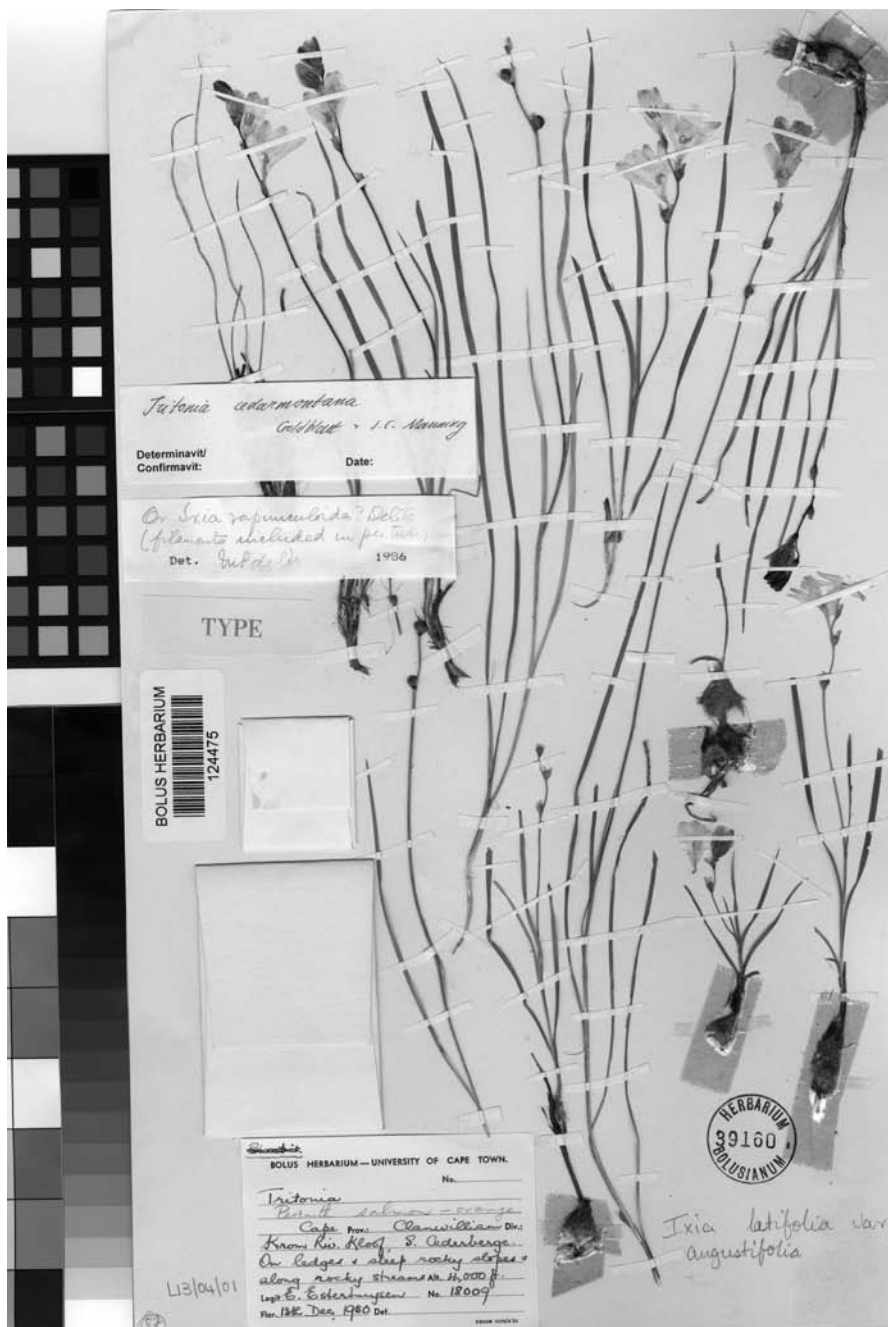


FIGURE 1.—*Tritonia cedarimontana*, Esterhuysen 18009 (BOL).

**Distribution and ecology:** *Tritonia cedarimontana* is known only from the extensive type collection made in Krom River Kloof in the southern Cedarberg by the late Cape Town botanist, Elsie Esterhuysen (Figure 2). The species was collected on ledges and steep sandstone slopes along streams.

**Diagnosis and relationships:** *Tritonia cedarimontana* is a diminutive species with narrow, linear leaves mostly 1.5–2.0 mm wide and a moderately lax, few-flowered spike of small, salmon-orange flowers without evident calluses on the lower tepals. The dorsal tepal is subpatent, rather than arched and hooded as in most species of *Tritonia* and the filaments are short, 4–5 mm long, with the anthers half-included in the funnel-shaped tube that is 9–10 mm long. The species has a remarkable superficial similarity in the dry state to *T. parvula* N.E.Br., sect. *Montbretia* (DC.) Pax, from the Little Karoo, notably in its small stature, narrow leaves, and small, orange flow-

ers, and the single collection was assigned to this species by De Vos despite the considerable geographical disjunction. The three lower tepals in *T. parvula* are, however, strongly flexed downwards, and each has the high,  $\pm$  oblong, median tooth-like callus or ridge that is diagnostic of the section (De Vos 1982, 1983). These calluses are not developed in *T. cedarimontana*, which also differs from *T. parvula* in its subpatent dorsal tepal not strongly differentiated from the lower tepals, and in its shorter filaments, 4–5 mm vs 6–10 mm.

On the basis of its zygomorphic, pinkish orange flowers without callus ridges on the lower tepals, *Tritonia cedarimontana* is placed in sect. *Subcallosae* but its immediate relationships are not clear. Sect. *Subcallosae* currently comprises six species that fall into two distinct groups. The first comprises four species from the southwestern Cape and Little Karoo, *T. bakeri* Klatt, *T. pallida* Ker Gawl., *T. flabellifolia* (D. Delaroche) G.J. Lewis

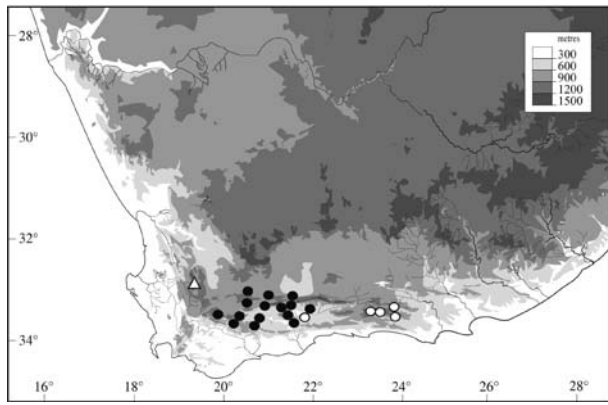


FIGURE 2.—Known distribution of *Tritonia cedarimontana*,  $\Delta$ ; *T. linearifolia*,  $\circ$ ; *T. pallida*,  $\bullet$ .

and *T. linearifolia* (described here), all with white or cream-coloured flowers with elongate perianth tubes longer than the tepals. The second group comprises two species from the southern Cape and southeastern summer rainfall region, *T. gladiolaris* (Lam.) Goldblatt & J.C.Manning (= *T. lineata* (Salisb.) Ker Gawl.) and *T. disticha* (Klatt) Baker, both with short-tubed, funnel-shaped flowers and leaves with a prominent submarginal vein. Florally, *T. cedarimontana* is most similar to orange-flowered *T. disticha* but it is vegetatively unlike this species, and since this flower type may be plesiomorphic in the genus, its relationships to the other species in the section, and even its sectional assignment, remain uncertain.

***Tritonia linearifolia* Goldblatt & J.C.Manning, sp. nov.**

Plantae (100–150–500(–600) mm altae a *Tritonia pallida* cormelis in sobolibus brevibus fasciatis productis, foliis per anthesin siccis suberectis vel trahentibus, laminis linearibus 1–2 mm latis caulem aequantibus vel paulo superantibus recedit.

TYPE.—Eastern Cape: 3323 (Steytlerville): Joubertina, Kouga Mountains, valley of Dwarsrivier west of Kransfontein Farm, (–CA), 12 December 2009, Manning 3244 (NBG, holo.; MO, iso.).

Plants (100–150–500(–600) mm high; corm subglobose or depressed-globose, 10–20 mm diam.; tunics somewhat papery, of fine-textured fibres, extending in a papery or fibrous neck; developing clusters of cormels at base on short, appressed, flattened, fasciated stolons; stem  $\pm$  erect below, usually unbranched but with up to 2 branches. Leaves 7–12, dry at flowering, suberect or trailing and slightly twisted,  $\pm$  as long as stem or slightly longer, linear, (10–)20–60  $\times$  1–2 mm, soft-textured with central vein moderately thickened. Spike inclined, (2–)4–8-flowered; bracts soft-textured and membranous, lanceolate, 8–12 mm long, translucent or straw-coloured and lightly flushed or speckled brownish distally with darker brown veins, minutely trifid or median tooth obsolete, inner bracts slightly shorter, bifid. Flowers zygomorphic, white with purple veins on reverse, lower three tepals with narrow, median, yellowish green longitudinal mark at base, unscented; perianth tube slender and tubular but expanded and bell-shaped

distally, 35–45 mm long, straight but slightly curved in upper part; tepals unequal with uppermost largest, dorsal and lower median tepals suberect but remaining tepals spreading in distal half, dorsal tepal ovate-elliptic, 18–20  $\times$  10–12 mm, remaining tepals oblong, 18–20  $\times$  5–7 mm, lower three tepals with low, median, ridge-like callus. Stamens arcuate and unilateral; filaments 13–16 mm long, inserted 5–6 mm within tube; anthers 5–6 mm long, apiculate, purple with purple pollen. Style arching over stamens, dividing opposite middle or apex of anthers, branches  $\pm$  2 mm long. Capsules and seeds unknown. Flowering time: early to middle December. Figure 3A–D.

**Distribution and ecology:** *Tritonia linearifolia* is largely restricted to the lower slopes of the Kouga and Baviaanskloof Mountains but is also recorded from the northern foothills of the Fouriesberg at the western end of the Outeniqua Mountains (Figure 2). Although poorly collected, the species does not appear to be uncommon on the southern slopes of the Kouga Mountains, where it occurs in colonies on cooler, south-trending, rocky sandstone slopes. The corms are wedged among the rocks in loamy soil, and the leaves are dry and withered at flowering, which takes place in early summer, in December. The unscented, white flowers with purple anthers conform to the *Moegistorhynchus*–*Philoliche* long-proboscid fly pollination guild (Goldblatt & Manning 2000). Other local species that we predict to be members of this guild are *Tritonia bakeri* Klatt and *T. pallida* Ker Gawl. (Iridaceae), *Pelargonium peltatum*, and *P. tetragonum* (Geraniaceae), and *Dianthus caespitosus* subsp. *caespitosus* (Caryophyllaceae). Populations of the *Dianthus* from the Little Karoo constitute a distinct race with an exceptionally long calyx, cream-coloured petals, purple anthers, and flowers that are unscented at night, unlike subsp. *pectinatus*, which has a shorter calyx, pink petals with pale anthers and are scented at night (unpublished obs.).

**Diagnosis and relationships:** *Tritonia linearifolia* is recognized by its inclined spikes of white, long-tubed, zygomorphic flowers with low, greenish yellow, ridge-like calluses in the throat, and linear, grass-like leaves, 1–2 mm wide and dry at flowering. The reduced, linear callus ridges and linear leaves place it in sect. *Subcallosae*.

The relationships of *Tritonia linearifolia* lie with *T. pallida*, from which it is practically indistinguishable in its flowers (Figure 3E), and the two may comprise a vicariant species pair. They are readily separated vegetatively and in their ecology. *T. pallida* has noticeably wider, lanceolate leaves, 8–15 mm wide, and often longer floral bracts, up to 20 mm long, and is centred in the western and central Little Karoo, between Oudtshoorn and Montagu, with outlying populations north of the Swartberg from Whitehill to Laingsburg. *T. pallida* occurs on shale slopes, primarily in renosterveld or transitional vegetation types, flowering from mid-September to late October. *T. linearifolia*, in contrast, has very narrow, linear leaves, 1–2 mm wide, and is known mainly from the Longkloof and Baviaanskloof, with a single collection to the west from Fouriesberg in the Little Karoo south of Calitzdorp. The species is restricted to rocky sandstone slopes, in arid and grassy fynbos veg-

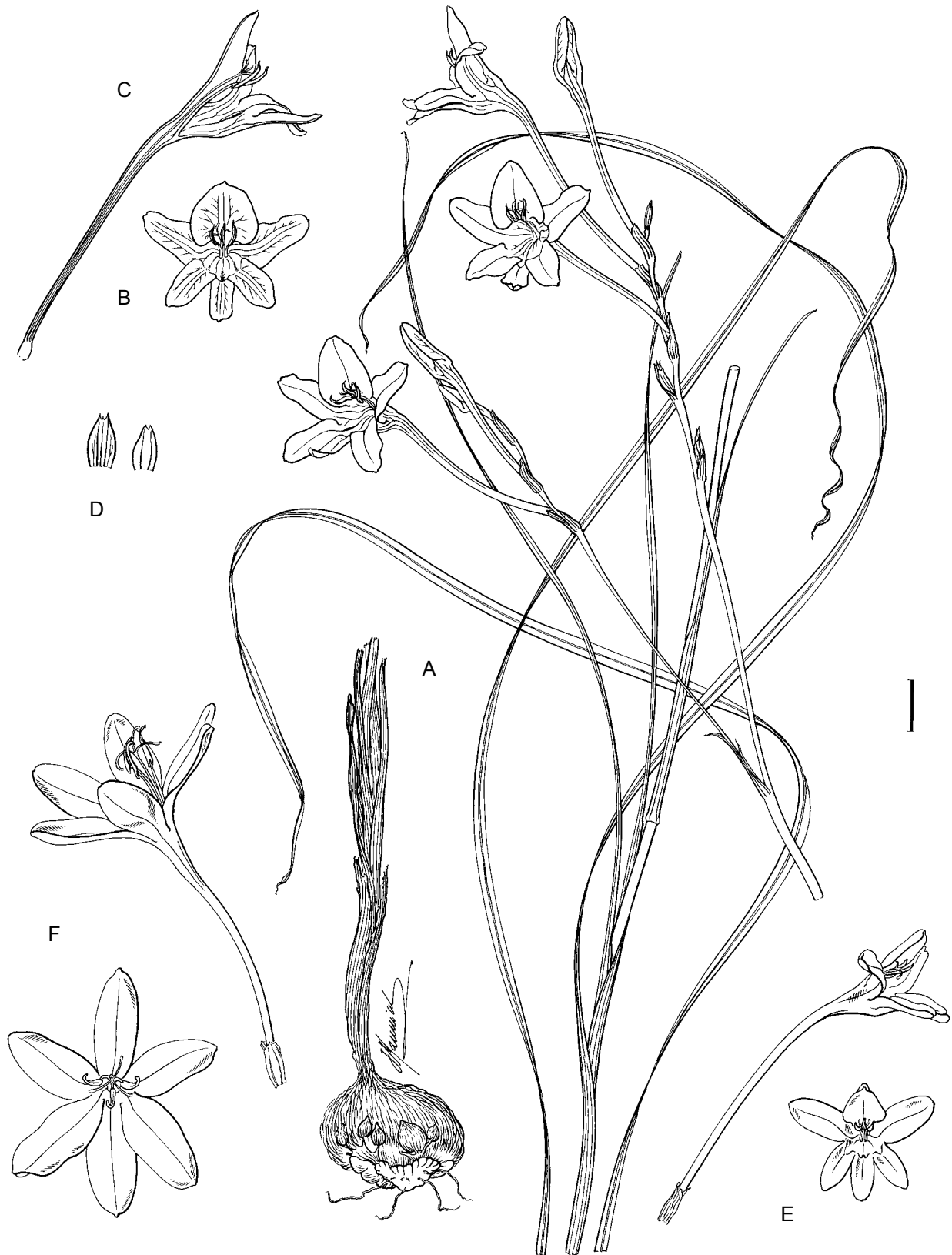


FIGURE 3.—A–D, *Tritonia linearifolia*, Manning 3244: A, flowering plant; B, flower, front view; C, half flower; D, bracts, outer (left) and inner (right). E, *T. pallida*, Goldblatt & Manning 10760 (NBG): flower, front and side view. F, *T. bakeri*, Manning 2909 (NBG): flower, front and side view. Scale bar: A–F, 10 mm. Artist: John Manning.

etation, flowering much later than *T. pallida*, in December.

Collections of *Tritonia linearifolia* have until now been misidentified as *T. bakeri*, another long-tubed spe-

cies widespread through the Little Karoo from Ladismith to the Langkloof, on the basis of the long, linear leaves but the resemblance between the two is superficial. The leaves of *T. bakeri* are highly characteristic, being fleshy and semi-terete in section when fresh,

without an evident midrib or true margins (De Vos 1999: fig. 29). Flowering in this species takes place somewhat earlier, mainly October to November, at which time the foliage is still green. This contrasts with the  $\pm$  plane, thin-textured leaves of *T. linearifolia*, in which the midrib is thickened and evident, and which are quite dry at flowering time, in December. The two species are florally quite different, although this is best seen when they are fresh. Both species have inclined spikes but the flowers are differently orientated in the two: *T. linearifolia* has a clearly zygomorphic perianth and conventional floral orientation, with the dorsal tepal in the uppermost position and the stamens arched above the entrance to the floral tube, thus pollen deposition is nototribic; *T. bakeri*, in contrast, has an almost actinomorphic perianth with the flowers curved or slightly twisted at the base so that the morphologically dorsal tepal assumes a ventral position, with the stamens almost central and the anthers facing the spike apex, and pollen deposition thus  $\pm$  sternetotribic (Figure 3F).

#### Additional specimens

WESTERN CAPE.—3321 (Ladismith): Outeniqua Mtns, lower northern slopes of Fouriesberg, 1600' [1 000 m], (–DD), 13 Dec. 1987, Viviers & Vlok 369 (NBG).

EASTERN CAPE.—3324 (Steytlerville): Baviaanskloof Mtns, next to track at Bosrug, 3800' [2 375 m], (–CA), 20 Dec. 1985, Vlok 1333 (MO, NBG, PRE); Farm Joubertkraal, (–CC), 17 Dec. 1997, Van Jaarsveld 15601 (NBG).

*Tritonia gladiolaris* (= *T. lineata*) is a widespread species ranging from Mossel Bay in Western Cape through Eastern Cape and KwaZulu-Natal to Mpumalanga (De Vos 1983). A few collections of smaller plants in the southeast of the range between Jeffrey's Bay and Port Elizabeth were segregated as var. *parvifolia* by De Vos (1983) based on their smaller size (up to 300 mm tall) and shorter leaves (< 150 × 5 mm). The two varieties are florally identical (De Vos 1983) and we have encountered several depauperate plants among collections of the typical variety that match var. *parvifolia* in their reduced size and foliage. We conclude that the taxon does not deserve taxonomic rank.

***Tritonia gladiolaris* (Lam.) Goldblatt & J.C. Manning** in *Bothalia* 36: 57 (2006). *Ixia gladiolaris* Lam.: 341 (1789). Type: South Africa, Cape of Good Hope, cultivated in Paris, original collector unknown (P–Herb. Lamarck, holo.).

*T. lineata* var. *parvifolia* M.P.de Vos: 374 (1983), syn. nov. Type: South Africa, [Eastern Cape], Jeffrey's Bay, *Fourcade* 3345 (NBG, holo.); K, MO, PRE, iso.).

*Tritonia strictifolia* is currently cited (De Vos 1983) as *T. strictifolia* (Klatt) Benth. & Hook.f. (1883). However, although Benth. & Hooker's account of *Tritonia* mentions the basionym *Crococsmia strictifolia* Klatt as belonging to *Tritonia*, they do not cite the combination by name, and their inferred combination is thus invalid (McNeill *et al.* 2006: Art. 33.1). A combination (autonyms excepted) is not validly published unless the author definitely associates the final epithet with the name of the genus or species, or with its abbreviation. Article 33.1 Example 2 provides a parallel example. The valid combination *T. strictifolia* Benth. & Hook.f. is provided in *Index kewensis* by the editor, B.D.Jackson,

who also provided reference to the Benth. & Hooker treatment of *Tritonia* in which the basionym is cited. The correct author citation for the species is thus as follows:

***Tritonia strictifolia* (Klatt) Benth. & Hook.f. ex B.D.Jacks.** in *Index kewensis* 2: 1129 (1895). *Montbretia strictifolia* Klatt: 753 (1864). *T. laxifolia* var. *strictifolia* (Klatt) Baker: 195 (1892). Type: South Africa, [Eastern Cape], Uitenhage, Kalkhoogte between the Swartkops and Sundays Rivers, *Ecklon & Zeyher* 100 (B, lecto., designated by De Vos: 118 (1999); G, S, SAM, Z, iso.).

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