

A taxonomic review of the dry-fruited species of *Anemone* (Ranunculaceae) in southern Africa

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ABSTRACT

The three dry-fruited species of *Anemone* sect. *Pulsatilloides* subsect. *Alchemillifoliae* (Ranunculaceae) from southern Africa are reviewed, with full descriptions and nomenclature, including complete synonymy, taxonomic history with nomenclatural corrections, ecological notes, and distribution. *A. tenuifolia* (L.f.) DC. from the Cape Floristic Region is segregated as ser. *Pinnatifoliae* from the two summer rainfall species, *A. caffra* (Eckl. & Zeyh.) Harv. and *A. fanninii* Harv. ex Masters, which remain in ser. *Alchemillifoliae*, emphasising the strong vegetative differences between the two series.

INTRODUCTION

Generic relationships of tribe Anemoneae DC. (Ranunculaceae–Ranunculoideae) have been the subject of intensive morphological and molecular investigations (Hoot *et al.* 1994; Ehrendorfer & Samuel 2001; Schuettelpelz *et al.* 2002; Hoot *et al.* 2012), resulting in the recent expansion of the circumscription of *Anemone* L. to include the small segregates *Barneoudia* C. Gay (3 spp.), *Hepatica* Miller (7 spp.), *Knowltonia* Salisb. (8 spp.), *Oreithales* Schldl. (1 sp.) and *Pulsatilla* Miller (\pm 38 spp.) (Tamura 1993). Second largest genus of tribe Anemoneae after *Clematis* L., *Anemone* s. l. is diagnosed by the presence of one or more leafy, cauline involucre beneath the flower, and a perianth comprised of imbricate, petaloid sepals only. It includes \pm 200 species distributed throughout the world, primarily in the Northern Hemisphere with only a modest representation on the southern continents, where \pm 30 species are recorded mainly from montane regions with a temperate climate (Ziman *et al.* 2006). The austral representatives are concentrated in South America (12 spp.) and southern Africa (11 spp.), with *A. thomsonii* Oliver endemic to east tropical Africa and a handful of additional species in Indonesia and Australasia (Hoot *et al.* 2012).

Anemone in southern Africa traditionally included just three species with dry fruits, but has since been enlarged to 11 spp. by the recent transfer of the eight fleshy-fruited species of *Knowltonia* (Manning *et al.* 2009). Although previously treated in *Anemone* by some authors, this close-knit group of species was generally retained as a distinct genus on the basis of its compound inflorescences of relatively small flowers and its baccate or berry-like fruits. Phylogenetic analysis of plastid and nuclear DNA sequence data has now confirmed its

intimate relationship to the southern African *Anemone* species with dry fruits, with which it shares apomorphic pantoporate pollen, and all of the southern African species are now associated as subsect. *Alchemillifoliae* (Ulbrich) Hoot of *A.* sect. *Pulsatilloides* DC. (Hoot *et al.* 2012). The fleshy-fruited species, which constitute ser. *Knowltonia* (Salisb.) J.C. Manning & Goldblatt within subsect. *Alchemillifoliae*, have been well monographed by Rasmussen (1979) [as the genus *Knowltonia*]. This is not the case with the dry-fruited southern African species, which, as yet, have been treated only incompletely or superficially (De Candolle 1824; Pritzel 1841; Harvey 1860; Ulbrich 1906), most recently as part of a wide-ranging review of all austral species of *Anemone* (Ziman *et al.* 2006). Although very valuable, this latter treatment is nomenclaturally incomplete and also perpetuates some errors, notably the incorrect name and authors for *A. tenuifolia* (L.f.) DC., as well as containing some mistakes in typification. We provide a complete review of the taxonomy and nomenclature of the dry-fruited species of *Anemone* from southern Africa, including full synonymy, taxonomic history, ecological notes and distribution.

Taxonomic relationships among the dry-fruited southern African species of *Anemone* were first formalised by Ulbrich (1906), who segregated *A. tenuifolia* [as *A. capensis*] in the monotypic ser. *Pinnatifoliae*; retaining *A. caffra* and *A. fanninii*, the two rosulate species with unligified caudices and palmate leaves, in ser. *Alchemillifoliae*. This treatment, with an emphasis on morphology, was followed by subsequent authors until recently when Hoot *et al.* (2012) weighted phylogenetic considerations by including all three species in an expanded ser. *Alchemillifoliae* within subsect. *Alchemillifoliae*, arguing that the two leaf morphs of *A. tenuifolia* differed more from one another in DNA base sequences than did *A. caffra* from *A. fanninii*. There is no compelling morphological basis for this treatment, since *A. tenuifolia* is intermediate between ser. *Knowltonia* and ser. *Alchemillifoliae* in having the compound foliage of the former but the sericeous, fusiform achenes of the latter. The molecular topology retrieves ser. *Knowltonia* as sister to a clade in which *A. tenuifolia* is in turn sister to *A. caffra* + *A. fanninii* and is thus consistent with either classification. Significantly, however, the cladistic

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branches subtending *A. caffra* / *A. fanninii*, the two leaf morphs of *A. tenuifolia*, and the members of ser. *Knowltonia* in the molecular phylogram presented by Hoot *et al.* (2012) are all of similar length, indicating comparable levels of sequence divergence of the three lineages from their last common ancestor. This observation, coupled with the clear morphological and ecological differences among the lineages, prompts us to revert to the segregation of the dry-fruited species in two series, with the fleshy-fruited species comprising a third series. This classification, which incorporates both phenetic and phylogenetic information, seems more appropriate to us than the alternative that stresses the slightly closer phylogenetic relationship between the dry-fruited species over their obvious morphological diversity. We do not consider ser. *Knowltonia* further here, and readers are referred to the taxonomic revision by Rasmussen (1979) and the revised generic placement by Manning *et al.* (2009) for further details.

MATERIALS AND METHODS

All relevant types were examined, as well as all specimens from BOL, MO, NBG, PRE and SAM (acronyms after Holmgren *et al.* 1990), the herbaria housing the most comprehensive collections of southern African species. All species were also studied in the field.

TAXONOMY

Anemone L., Species plantarum: 538 (1753). Type: *A. coronaria* L.

Knowltonia Salisb.: 372 (1796). Type: *Knowltonia rigida* Salisb., nom. illegit. = *Anemone knowltonia* Burt Davy

Perennial, rhizomatous herbs, rarely shrublets. *Leaves* basal, alternate, simple and palmate or ternately compound, toothed, petiole base sheathing; flowering stem with 1–5 whorls of 2–4, partly fused leaves. *Inflorescence* 1-flowered or of di- or tri-chasial, umbelliform cymes, the umbels and umbellules surrounded by involucre of compound or simple leaves. *Flowers* bisexual. *Sepals* numerous, petaloid, imbricate, deciduous, the outer usually differing slightly in colour, form and hairiness from the inner. *Petals* 0. *Stamens* numerous, centrifugal or centripetal. *Carpels* numerous, each with 1 pendulous ovule. *Fruitlets* clustered, usually achenes but sometimes drupes, glabrous to tomentose, rarely with a plumose, tail-like beak.

± 200 spp., cosmopolitan, mainly Northern Hemisphere; 11 spp. in southern Africa.

subg. **Anemone**

sect. **Pulsatilloides** DC., Regni vegetabilis systema naturale 1: 195 (1817). Lectotype, designated by Tamura (1995): *A. capensis* Lam., = *A. tenuifolia* (L.f.) DC.

subsect. **Alchemillifoliae** (Ulbrich) Hoot, Systematic Botany 37: 149 (2012). A. ser. *Alchemillifoliae* Ulbrich: 201 (1906). A. sect. *Alchemillifoliae* (Ulbrich) Tamura: 179 (1991). Lectotype, designated by Tamura (1995): *A.*

caffra (Eckl. & Zeyh.) Harv.

Plants with horizontal or ascending caudices. *Leaves* palmate or pinnately compound, toothed. *Inflorescence* simple or once- or twice-compound. *Flowers* with numerous (10–20) ± linear to narrowly elliptical sepals. *Achenes* numerous, usually four times longer than wide, glabrous or tomentose, dry or fleshy. *Pollen* pantoporate.

11 spp., temperate southern Africa

Key to series

- 1a. Leaves palmately lobed ser. *Alchemillifoliae*
- 1b. Leaves ternately compound (rarely simple):
 - 2a. Inflorescence simple, 1-flowered (rarely with up to two secondary, involucrellate flowers); tepals larger, 20–40 mm long; fruits fusiform, dry, densely silky ser. *Pinnatifoliae*
 - 2b. Inflorescence compound, several- to many-flowered; tepals smaller, 10–20 mm long; fruits ovoid or ellipsoid, ± fleshy, glabrous to puberulous ser. *Knowltonia* [see Rasmussen (1979) for taxonomic account]

Key to dry-fruited species (ser. *Alchemillifoliae* and *Pinnatifoliae*)

- 1a. Subshrub with woody caudex; leaves ternately decom- pound, sclerophyllous, glabrescent, margins revolute 1. *A. tenuifolia*
- 1b. Rosulate perennials; leaves palmate, leathery, persistently pubescent, margins plane:
 - 2a. Plants smaller, peduncle 100–200 mm long; leaf blades (40–)60–100(–130) mm diam., mostly cleft less than halfway, usually thinly pubescent above and glabrescent or thinly pubescent beneath, mainly along nerves, rarely densely villous beneath, petioles 40–150 mm long; flow- ers 1(2), sepals dimorphic or ± monomorphic, outer usu- ally only thinly sericeous beneath 2. *A. caffra*
 - 2b. Plants larger, peduncle 200–800 mm long; leaf blades 150–350 mm diam., mostly cleft more than halfway, thickly velvety above and densely villous beneath, peti- oles 200–700 mm long; flowers (1)2–4, sepals dimor- phic, outer ± densely sericeous or villous beneath 3. *A. fanninii*

ser. **Pinnatifoliae** Ulbrich, Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie 37: 239 (1906). Type: *A. capensis* (L.) DC., hom. illegit. = *A. tenuifolia* (L.f.) DC.

Evergreen subshrub with aerial, lignified caudex. *Leaves* pinnately compound or decom- pound, coriaceous, margins revolute. *Inflorescence* usually simple, 1-flow- ered, rarely compound with 1 or 2 secondary flowers each with individual involucre. *Achenes* fusiform, seri- ceous, walls dry.

1 sp., South Africa, Cape Floristic Region, mainly winter rainfall in fynbos.

1. **Anemone tenuifolia** (L.f.) DC., Regni vegetabilis systema naturale 1: 196 (1817); DC.: 18 (1824); Pritzl: 613 (1841). *Atragene tenuifolia* L.f.: 270 (1782). *Clematis tenuifolia* (L.f.) Poir. in Lam.: 298 (1812). *Pulsatilla tenuifolia* (L.f.) Spreng.: 664 (1825). *A. capensis* var. *tenuifolia* (L.f.) Harv.: 3 (1860); Ulbrich: 239 (1906). Type: ‘Cape’, Thunberg s.n. UPS-THUNB 12999 (UPS-THUNB—microfiche!, lecto., designated here).

Atragene capensis L.: 543 (1753). *Clematis capensis* (L.) Poir. in Lam.: 296 (1812). *Anemone capensis* (L.) DC.: 195 (1817), hom. illegit. non. Lam. (1783); DC.:

18 (1824); Ulbrich: 239 (1906). *Anemone capensis* (L.) Harv.: 3 (1860), hom. illegit. non Lam. (1783); Ziman *et al.*: 207 (2006) [as *A. capensis* (L.) Lam.]. *Pulsatilla africana* Hermann ex Spreng.: 664 (1825), nom. illegit. superfl. pro *Atragene capensis* L. *Anemone arborea* [Hort.] Steud.: 95 (1840), nom. illegit. superfl. pro *Pulsatilla africana* [Hermann ex Spreng.]. Type: illustration “*Pulsatilla foliis trifidus, dentatis, flore incarnato, pleno*” in Burman: 148, t. 52 (1738), lecto!., designated by Oliver: t. 1569 (1969).

Anemone capensis Lam.: 164 (1783); Pritzel: 612 (1841). Type: ‘Cape’, without collector or date, *Herb. Jussieu 10.536* (P-JU—digital image!, holo.)

Atragene tenuis Thunb.: 239 (1784). Type: not cited. Neotype: ‘Cape’, *Thunberg s.n. UPS-THUNB 12999* (UPS-THUNB—microfiche!, neo., designated here).

[*Nomenclatural notes*: there is no indication that the specimen *LINN 711.3*, listed as the type of *Atragene capensis* L. by Killick (1977), constitutes original material. The typification of the name by Ziman *et al.* (2006) against an unspecified specimen in the Linnean Herbarium (LINN) presumably follows Killick (1977), but lacking the requisite specific intent cannot be treated as valid lectotypification in any event [Art. 7.11: McNeill *et al.* (2006)]. The typification by Ziman *et al.* (2006) of the supposed combination *Anemone capensis* (L.) Lam. against a ‘Thunberg & Ecklon’ specimen in Paris is inexplicable, not only by virtue of the fact that Ecklon arrived at the Cape half a century after Thunberg departed it, but also by the fact that a combination is automatically typified by the type of the basionym.

There is no specimen under the name *Atragene tenuis* in Thunberg’s herbarium nor is the species included in his *Flora capensis* (Thunberg 1823), but the name was treated as a synonym of *At. tenuifolia* L.f. by both Poiret (Lamarck 1812) and De Candolle (1818), and the concordance between the description of *At. tenuis* and that of *At. tenuifolia* in Thunberg’s *Flora capensis* is consistent with this interpretation. There is no reason to doubt that the two names apply to the same taxon and it is likely that both were in fact based on the same Thunberg collection. We therefore designate the specimen in the Thunberg herbarium as a neotype to fix this application. Although the specimen itself is not precisely localised, the collecting locality is cited as the Groot Winterhoek Mtns behind Tulbagh by Thunberg (1823) in his *Flora capensis*.]

Evergreen, rhizomatous subshrub with woody rootstock 10–15 mm diam., aerial stems erect, leafy, 15–150 mm long, simple or branched, partially covered with membranous or fibrous remains of old leaf bases. *Leaves* cauline, few to many, distant below but imbricate above, fully-developed at flowering, bi- to tritermately compound, ovate in outline, 40–120 × 30–100 mm, densely sericeous when young, glabrescent but persistently sericeous inside basal sheath, leaflets sessile or petiolulate, cuneate and 1–2 times pinnately lacerate or pinnate to bipinnate with needle-like segments 5–20 mm long, sclerotic, margins narrowly revolute, teeth or ultimate segments mucronate; petiole suberect, rigid, 15–100 mm long. *Inflorescence* 1-flowered, rarely compound with 1

or 2 secondary inflorescences, scape 60–500 mm long, 1.5–3.0 mm diam., thinly or densely villous; involucre bracts 3, entire or incised, 20–50 mm long, sometimes leaf-like with pinnatisect blade; pedicels 60–150(–220) mm long, villous. *Flowers* white to pale pink or mauve; sepals 12–25, dimorphic, narrowly elliptic or ± linear, 20–40 × 4–8 mm, obtuse to acute, outer wider and often longer than inner and densely sericeous beneath. *Stamens* centrifugal; filaments linear, 4–6 mm long, anthers 1.0–1.5 mm long, yellow. *Carpels* 4–6 mm long: ovary ovoid, 2–3 mm long, villous with hairs 1–2 mm long, style 2–3 mm long, subglabrous. *Infructescence* subglobose to shortly cylindrical, 15–20 mm diam. *Achenes* fusiform or arcuate, slightly compressed, 5–7 × 1.0–1.5 mm (excluding style), stipitate, densely sericeous with hairs 1–2 mm long (median hairs longest), style curved, ± 3 mm long, purple. *Flowering time*: mainly Aug. and Sept. but as late as Nov. at higher altitudes, rarely as early as Mar., mostly after fire. Figure 1.

Distribution and ecology: *Anemone tenuifolia* is largely restricted to the coastal slopes of the Cape Fold mountains, from the Bokkeveld Escarpment south to the Cape Peninsula and thence east to the Baviaankloof Mtns, extending inland along the southern coast onto the Kammanassie Mtns and the upper southern reaches of the Swartberg (Figure 2). It favours cooler, moister situations on south-facing slopes, typically in sheltered gulleys or in the lee of rocks, generally at moderate to high altitudes, 500–1 200 m but well above 1 500 m on the Swartberg and down to 300 m along the coast. Plants grow in moist, loamy soils, mostly on sandstone but also on granite, shale and limestone. Flowering has been recorded from autumn though summer but takes place mainly in winter and spring, and is strongly stimulated by a summer fire.

Diagnosis and relationships: the only dry-fruited winter-rainfall species of *Anemone* in South Africa, *A. tenuifolia* is a sclerophyllous, semi-shrub, with a distinctive, ± caulescent habit and glabrescent, bi- to tritermately leaves. The inflorescence is invariably 1-flowered and usually simple but occasionally compound, with one or two secondary, 1-flowered inflorescences developing within the primary involucre, each with a secondary involucre.

The species is highly variable in the degree of dissection of the leaves, which vary from biternate with cuneate, toothed or pinnatifid leaflets to tritermately pinnate leaflets divided into needle-like segments. The two extremes were, understandably enough, treated for some time as distinct species under the names *Atragene/Anemone tenuifolia* and *At./A. capensis* respectively, but with further collecting it is now clear that they represent part of the variation within a single species. The more highly dissected foliage morph is the most common and is found throughout the range of the species whereas forms with less-divided, biternate leaves are largely restricted to the extreme southwest, occurring on Table Mountain and adjacent mountain ranges, from Franschhoek to the Kogelberg. We have seen only one early collection of the less dissected leaf morph from outside of the southwestern Cape, from near Uitenhage (*Ecklon & Zeyher 679*).

A full range of leaf dissection can be found within a single population in the southwest, sometimes even within a single plant, with juvenile leaves tending to be less deeply dissected than those produced later (e.g. Manning 3361). This variation in leaf dissection among or even within individuals was first noted by Harvey (1860) on Table Mountain.

History: the first of the African anemones known to science, *Anemone tenuifolia* has a long history that has been vexed by nomenclatural confusion until today. Its first modern entry, in the *Species plantarum* under the name *Atragene capensis* (Linnaeus 1753), derives from a description and engraving [*Pulsatilla foliis trifidis, dentatis, flore incarnato, pleno*] published in Johannes



FIGURE 1.—*Anemone tenuifolia*, F. Anderson STE29969 (NBG, PRE). Artist: Fay Anderson. [*Flowering Plants of Africa* 60: pl. 1569 (1969)].

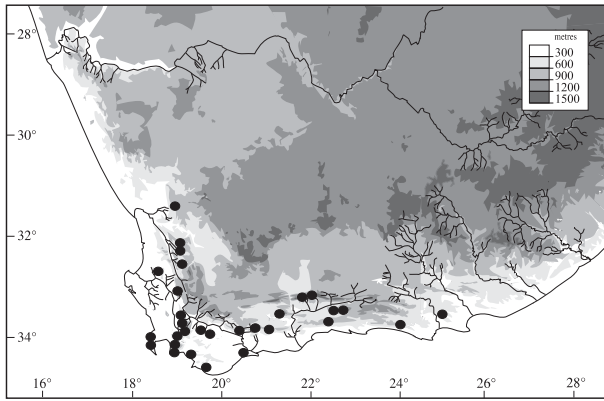


FIGURE 2.—Distribution of *Anemone tenuifolia*.

Burman's *Rariorum africanarum plantarum* (Burman 1738). The name was lectotypified against the Burman engraving by Oliver (1969), which depicts the form with biternate leaves. Burman's description includes references to both the *Codex Witsenii* and to Hermann's catalogue of African plants [*Pulsatilla Africana, Apii folio rigido, flore magno*]. The reference to the *Codex Witsenii*, which documents the natural history of Governor Simon Van der Stel's expedition to Concordia in 1685–1686 (Wilson *et al.* 2002), is perplexing as we find no reference to the species there. Paul Hermann (1646–1695), professor of Botany at Leiden, sailed for India in 1682 and called in at the Cape *en route*, where he made the first known herbarium collection of the local flora. *A. tenuifolia* is thus among the earliest elements of the Cape flora to become known to science.

Lamarck (1783) was the first to treat the species in the genus *Anemone*, under the name *A. capensis*, with an amplified description based on a specimen in De Jussieu's herbarium (now in P). Although it is possible that Lamarck merely intended transferring Linnaeus's name to *Anemone*, he refers in the protologue only to Hermann's polynomial and his name must therefore be treated as the new species *A. capensis* Lam., as was done by Pritzl (1841), with the De Jussieu specimen as the type (Oliver 1969). Ziman *et al.* (2006) are incorrect in treating Lamarck's name as the combination *A. capensis* (L.) Lam., based on *At. capensis* L.

This interpretation has several nomenclatural ramifications, most importantly that it precludes the transfer of *Atragene capensis* L. to *Anemone* by rendering any later combinations based on this name illegitimate later homonyms of *A. capensis* Lam. This was first done by De Candolle in his *Regni vegetabilis systema naturale* (De Candolle 1817) although most authors have mistakenly cited his later *Prodromus systematis naturalis regni vegetabilis* (De Candolle 1824) as the reference. In a further twist, Sprengel (1840) chose to follow Hermann in treating the species in the genus *Pulsatilla* as *P. africana* Hermann, a name that is rendered superfluous and illegitimate by Pritzl's citation of Linnaeus's *At. capensis* L. in synonymy. The correct name for the species in *Anemone*, based on *At. tenuifolia* L.f. as the next available name, is *A. tenuifolia* (L.f.) DC., as was established by Killick (1977), although again with the incorrect reference to De Candolle (1824).

In parallel with the proliferation of combinations for the form of the species with biternate leaves and cuneate segments matching the types of *Atragene capensis* L. and *Anemone capensis* Lam. was a similar multiplication of names for plants with more finely dissected, tri-ternate leaves originally described as *At. tenuifolia* L.f. (1782). This name appears to be based on a collection made in the Groot Winterhoek Mtns by Carl Peter Thunberg (1743–1828), who later described the species separately under the name *At. tenuis* Thunb. (1784). It was only in the latter half of the nineteenth century that the two foliage morphs were treated as varieties of a single species by Harvey (1860), and taxonomic recognition at even this level was later abandoned by Killick (1977).

Additional specimens

NORTHERN CAPE.—**3119** (Calvinia): Lokenburg, (–CA), S slopes, arid fynbos, 28 Jul. 1956, *J.P.H. Acocks 18901* (NBG, PRE); S edge of Oorlogskloof Nature Reserve, 780 m, (–CA), 4 Sep. 2006, *N.A. Helme 4275* (NBG).

WESTERN CAPE.—**3218** (Clanwilliam): Piketberg, (–DC), *Ecklon & Zeyher 5 Pulsatilla africana Herm.* (SAM); Piketberg, Versveld Pass, (–DC), 19 Jul. 1941, *P. Bond 1028* (NBG), *E. Esterhuysen s.n. PRE 54537* (PRE). **3219** (Wuppertal): Krakadouw Peak, 4 700' [1 420 m], (–AA), Sep. 1936, *C. Thorne SAM52512* (SAM); Cedarberg, Welbedacht, 1 100 m, (–AC), Waboomveld boulder slopes SW aspect, 15 May 1986, *H.C. Taylor 11517* (NBG); Cedarberg, slopes below Tafelberg, 1 103 m, (–AC), 19 Sep. 2004, *F. Forest et al. 601* (NBG); Citrusdal, Die Trap, (–CA), 9 Sep. 1997, *M.W. van Rooyen, H.M. Steyn & A.J. de Villiers 720* (NBG). **3318** (Cape Town): Jonkershoek, (–DD), usually in rank grass/Protea veld in moister localities, Jul. 1965, *O. Kerfoot 5331* (NBG); Jonkershoek, Dwaarsberg, (–DD), damp places, 28 Aug. 1963, *J.J. Bos 473* (NBG); Klein Drakenstein, (–DD), Aug. 1934, *G.E. du Plessis s.n.* (NBG); Assegaiboskloof, 1 300' [400 m], (–DD), TMS and granite, resprouting after burn, 16 Aug. 1962, *P. van der Merve 1211* (NBG); Stellenbosch Mtn, kloof above Nietegedund, 403 m, (–DD), steep SW slope burned earlier in the year, 22 Sep. 1991, *E.G.H. Oliver 9896* (NBG, PRE). **3319** (Worcester): Tulbagh, Groot Winterhoek, (–AA), Apr. 1916, *E.P. Phillips 1098* (SAM); Ceres, (–AD), Aug. 1929, *C.L. Wicht 59* (NBG); mountains near Wellington, (–CA), Aug. [without year], *A.V. Duthie STE9050* (NBG); Du Toitskloof, (–CA), Sept. 1886, *Thode STE9263* (NBG); Slanghoek Mtns, Witteberg, 4 000' [1 200 m], (–CA), 21 Nov. 1943, *E. Wasserfall 642* (NBG); Du Toitskloof Pass, on Paarl side near top, (–CA), 24 Jul. 1953, *W.F. Barker 8029* (NBG); Du Toits Kloof, Molenaars Peak, (–CA), Oct. 1947, *T. Stokoe SAM63518* (SAM); Du Toitskloof Pass, Slanghoek Mtns, 597 m, (–CA), 22 Oct. 2008, *J.P. Roux 4447* (NBG); French Hoek [Franschoek], 31 Oct. 1913, *E.P. Phillips 1063* (SAM); French Hoek Pass, (–CD), 7 Oct. 1946, *W.F. Barker 4126* (NBG); Devil's Peak, near waterfall, (–CD), Sep. [without year], *Ecklon & Zeyher Pulsatilla africana Herm.* (SAM); Cape Peninsula, Devil's Peak, Saddleback, (–CD), July 1886, *J. Thode s.n.* (NBG *STE9265*, PRE A69); Devil's Peak, (–CD), Aug. 1887, *J. Thode STE7780* (NBG); Devil's Peak, (–CD), 18 July 1956, *H.A. Baker 1107* (NBG); Table Mtn near Kirstenbosch, (–CD), Aug. 1882, *P. MacOwan 81* (SAM); Skeleton Gorge, (–CD), 18 Nov. 1897, *E.E. Galpin 3733* (PRE); 11 Sep. 1928, *J.B. Gillett 30* (NBG); Table Mtn, (–CD), 26 Oct. 1924, *H.M. Forbes 141* (NH); Table Mtn, top of Grotto Ravine, (–CD), 18 Sep. 1938, *R.H. Compton 7404* (NBG); Back Table, (–CD), Aug. 1972, *C.D. McKinnon 146* (NBG) (Montagu): Swellendam Mtn, 3 500' [1 060 m], (–CD), 4 Feb. 1941, *R.H. Compton 10601* (NBG); Swellendam, 10 o'clock Mtn, (–CD), May 1952, *T.M. Wurts 91* (NBG); Langeberg, alongside footpath to 10 o'clock Peak, S-facing slope, 800 m, (–CD), 1 Apr. 1987, *J. du Plessis 12* (NBG); Langeberg, Heidelberg, Lemoenshoek Peak, upper S slopes, (–DA), 19 Oct. 1966, *J.P. Rourke 628* (NBG); Lemoenshoek Peak, thick fynbos on wet steep slope, (–DA), 7 Dec. 1981 [sterile], *C.H. Stirton 10222* (NBG); Grootvadersbosch State Forest, near Helderfontein huts, 1 158 m, (–DD), cool SW-facing slope above stream, 17 Sep. 1985, *McDonald & Morley 956* (PRE). **3321** (Ladismith): Rooiberg, Ararat Ridge, 4 100' [1 242 m], (–CB), moist patch on SW slope, 18 Dec. 1977, *H.C. Taylor 9770* (NBG); Garcia State Forest, N slopes of Sleeping Beauty, 3 000' [900 m], seepage zone, (–CC), 9 Aug. 1977, *A.J. Lamb 16* (NBG). **3322** (Oudshoorn): Swartberg Pass, S side, steep rocky ridge, heathland, 1 415 m, (–AC), 9 Nov. 1977, *W.J. Bond 1130*

(NBG); Swartberg between Waboomsberg and Kanonberg, 6 000' [1 820 m], (–BD), dry grassy ledges and slopes just below summit, 30 Dec. 1969, *E.G.H. Oliver 3057* (NBG); Montagu Pass, Cradock Peak, (–CD), Jan. 1940, *H. Zimm s.n. SAM54812* (SAM); Kammanassieberg, 1 460 m, (–DB), along bank above road, recently burned, 4 Jul. 1990, *H.W. van Tonder68* (PRE); [Kammanassie Mtns], S slopes of Mannetjiesberg, 5 000' [1 510 m], (–DB), steep cool slopes at narrow altitude range, 19 Sep. 1954, *H.C. Taylor 1477* (PRE); upper TMS shaleband, 18 Sep. 1967, *J.P. Rourke 867* (NBG); 2 Oct. 1971, *E.G.H. Oliver 3606* (NBG). **3418** (Simonstown): Constantiaberg, (–AB), 18 Mar. 1943, *E. Wasserfall 147* (NBG); Orange Kloof, (–AB), 1 Aug. 1965, *F. Anderson STE29969* (NBG, PRE); Muizenburg, mountain, (–AB), Jul. 1922, *Anon STE15862* (NBG); Kalk Bay Mtn, 300 m, (–AB), upper slopes, 29 Sep. 1974, *P. Goldblatt 2833* (NBG); Somerset West, Helderberg Nature reserve, (–BA), recently burned, 15 Jan. 2012 [fruiting], *J. Manning 3361* (NBG); Somerset West, slopes of Haal Kop, (–BB), Aug. 1921, *J. Hauptfleisch STE1294* (NBG); Somerset Sneekop, shale band facing SE, steep slopes, locally frequent in firebreak, 4 400' [1 330 m], (–BB), 16 Nov. 1969, *E.G.H. Oliver 3014* (NBG); Kogelberg, (–BD), Sep. 1953, *T. Stokoe SAM65791* (SAM); Kogelberg, SE slopes of Platberg, below rock overhang, moist, (–BD), 17 Aug. 1968, *C. Boucher 146* (NBG, PRE); Platberg, steep S-facing slopes in kloof, recently burnt, damp sandy/peaty soil, 2 000' [606 m], (–BD), 3 Dec. 1969 [fruiting], *E.G.H. Oliver 3035* (NBG); Betty's Bay, S-facing slopes near Leopard's Gorge, (–BD), 27 Oct. 1970, *W. Ebersohn 126* (NBG); Leopard's Kloof, in shade on S side of steep slopes, (–BD), 25 Nov. 1970 [flowering and fruiting], *W.F. Barker 10809* (NBG). **3419** (Caledon): Lebanon State Forest, Jakkals River, steep, moist S slope, 3 400' [1 030 m], (–AA), 1 Oct. 1980, *G. Forsyth 92* (NBG); Vogelgat, steep S-facing gully W of Castle Rock, 420 m, (–AD), 13 Sep. 1986, *I. Williams 3677* (NBG); Greyton, Perdekop, S slope in loamy soil, (–BA), 11 June 1982, *M. Viviers 415* (NBG); Riviersonderend, (–BA), Nov. [without year], *Ecklon & Zeyher Pulsatilla tenuifolia Spr.* (SAM); Riviersonderend Mtns, (–BB), Jan. 1949, *T. Stokoe SAM63519* (SAM); Riviersonderend Mtns, damp N slopes of Middelberg near top, (–BB), 11 Nov. 1997, *J. Manning 2144* (NBG); Riviersonderend Mtns, ridge W of Jonaskop, base of rocks in partial shade, 5 100' [1 545 m], 23 Nov. 1989, *E.G.H. Oliver 9336* (NBG); Groothagelkraal, limestone hills, local on S slope, (–DA), 24 July 1995, *P. Goldblatt & J.C. Manning 10209* (MO, NBG). **3420** (Bredasdorp): Potberg Mtn, steep S-facing slopes above deep kloof E of highest peak, damp peaty places, 500 m, (–BC), 28 Aug. 1979, *C. Burgers 2156* (NBG).

EASTERN CAPE.—**3324** (Steytlerville): [Tsitsikamma], Witte Els Bosch, mountain slopes above forest, (–CC), Sep. 1920, *H.G. Fourcade 926* (NBG); Baviaanskloof Mtns above Coutee's kraal, NW of Cambria, SE slope above kloof, 3 500' [1 060 m], (–DA), recovering from burn, 12 Sep. 1973, *E.G.H. Oliver 4536* (NBG). **3325** (Port Elizabeth): Uitenhage District, woods near Zwartkop River, (–CB), April [without year], *Ecklon & Zeyher 679* (SAM).

ser. *Alchemillifoliae* *Ulbrich*, *Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie* 37: 201 (1906). Lectotype, designated by Tamura (1995): *A. caffra* (Eckl. & Zeyh.) Harv.

Deciduous, rosulate perennials. *Leaves* palmate, leathery, pubescent. *Inflorescence* simple, 1–4-flowered. *Achenes* fusiform, sericeous, walls dry.

2 spp., South Africa and Lesotho, summer rainfall montane grasslands.

2. *Anemone caffra* (Eckl. & Zeyh.) Harv. in *Thesaurus capensis* 1: 5 (1859); Harv.: 4 (1860); Ziman *et al.*: 208 (2006). *Pulsatilla caffra* Eckl. & Zeyh.: 59 (1834–1835). *A. alchemillifolia* E.Mey. ex Pritz. [as '*alchemillaefolia*']: 614 (1841), nom. illegit. superfl. pro *Pulsatilla caffra* Eckl. & Zeyh.; *Ulbrich*: 240 (1906) [as *A. alchimillifolia*]. *A. alchemillifolia* var. *caffra* (Eckl. & Zeyh.) Huth: 423 (1896). Type: [Eastern Cape], 'In colibus apricis, graminosis (altit. IV) apud sedes "Tyali" Caffrorum principis ad pedem "Chumni- et Winterberg" prope "Philipstown"', *Ecklon & Zeyher s.n.* (S—digital

image [S07-15770]!, lecto., designated here; TCD—JSTOR image! [TCD0001713—left hand specimen], K—JSTOR image! [K000075969, K000075971], P—JSTOR image [P00078546, P00078547]!, PRE!, isolecto.). [The S duplicate is selected as lectotype as being from Ecklon's personal herbarium, acquired by Sonder and now partly in S and partly in MEL (Glen & Germishuizen 2010).]

A. alchemillifolia var. *grandiflora* Huth: 423 (1896), syn. nov.; *Ulbrich*: 240 (1906). Type: [Eastern Cape], 'Bazaja [Bazija], near forests and elsewhere, 600–1 000 m al', without date, *R. Baur s.n.* (SAM, lecto.!, designated here). [The location of Huth's types is unknown (Stafleau & Cowan 1979) and the SAM specimen is selected as lectotype as being the only one known to us. It comprises two well-pressed plants. The locality information 'In graminosis summi montis Bazija, alt. 3 500–4 000' [1 000–1 200 m], Nov.' is essentially identical with that given in the protologue and there is no reason to doubt that it represents the same collection. An unlocalised Baur collection in BOL is probably a duplicate.]

A. alchemillifolia var. *schlechteriana* Huth: 423 (1896), syn. nov.; *Ulbrich*: 240 (1906). Type: [Eastern Cape], 'In graminosis mont Insiswa [Ntsizwa] ad 2 000 m alt.', 28 Jan. 1895, *R. Schlechter* (BOL, lecto.!, designated here.). [The location of Huth's types is unknown (Stafleau & Cowan 1979) and we select as lectotype the only duplicate known to us.]

A. caffra var. *pondoensis* *Ulbrich*: 240 (1906), syn. nov. Types: [Eastern Cape], 'Bisher nur Pondoland', *Bachmann 1527*, †B, syn.; *C. Beyrich 286*, †B, syn.). [The absence of these two specimens at B was confirmed by R. Vogt and they are presumably destroyed.]

[*Nomenclatural note*: The identification by Ziman *et al.* (2006) of the type of *A. caffra* (Eckl. & Zeyh.) Harv. as 'Katberg, 4 000–5 000', 9 Nov. 1832, *Drège 3571* (K, P)' is incorrect. Ecklon & Zeyher (1834–1835) list only their collection cited above, which is thus clearly the type of the basionym. A Drège collection is, however, cited by Pritz (1841) as a syntype along with the Ecklon & Zeyher collection in the protologue to his *A. alchemillifolia* (1841). The citation by Ziman *et al.* (2006) of a Berlin duplicate of the *Ecklon & Zeyher* collection as the type of *A. alchemillifolia* E.Mey. ex Pritz. without comment does not constitute valid lectotypification of the name [Art. 7.11: McNeill *et al.* (2006)], which is in any event nomenclaturally superfluous in including both the type of *P. caffra* and the citation of that name in synonymy [Art. 52: McNeill *et al.* (2006)]. Neither the Drège nor the Ecklon & Zeyher collections are extant at B (R. Vogt pers. com.).]

Deciduous, rhizomatous perennial with woody rootstock 6–10 mm diam., covered with fibrous remains of leaf bases. *Leaves* rosulate, 2–5, emergent or fully-developed at flowering, palmately (5–)7(–9)-lobed (rarely-parted), mostly less than halfway, blade (40–)60–100(–180) mm diam., orbicular-cordate in outline, leathery, thinly pubescent above, paler and glabrescent or thinly pubescent beneath, mainly along nerves, rarely densely villous, margin hispidulous and bidentate (rarely

sub-crenate) with 3–8 primary teeth along each side of lobes, teeth with reddish mucro; petiole erect or spreading, rigid, 40–150 mm long, sericeous. *Inflorescence* simple, 1(2)-flowered, scape (100–)120–150(–210) mm long, 2–4 mm diam., thinly or densely villous; involucre bracts 3 or 4, entire or incised, 20–50 mm long, sometimes leaf-like with trifid blade; pedicels (60–)100–250 mm long, villous. *Flowers* white or pale pink, the outer tepals sometimes flushed pink or purple beneath, or bright pink, sometimes with white centre; sepals 12–20, dimorphic or \pm monomorphic, narrowly elliptic or \pm linear, 20–40(–55) \times 3–10(–18) mm, acute or obtuse, outer sometimes broader than inner and thinly to moderately densely sericeous beneath, often only basally. *Stamens* centrifugal; filaments linear, 5–7 mm long, anthers 0.8–1.5 mm long, yellow. *Carpels* 5–6 mm long; ovary ovoid, 2–3 mm long, sericeous with hairs 1.0–1.5 mm long, style 3–5 mm long, subglabrous. *Achenes* not seen. *Flowering time*: mainly Oct. to Nov., rarely earlier, flowering best after a winter burn. Figure 3.

Distribution and ecology: *Anemone caffra* is distributed throughout the mountains of the Eastern Cape from Grahamstown to Kokstad and inland on the Winterberg into southern Lesotho, with scattered collections further north along the foothills of the KwaZulu-Natal Drakensberg as far as Nkandla (Figure 4). Plants favour cooler, grassy or scrubby slopes, sometimes along watercourses, from 300–2 000 m but mostly below 1 500 m. Flowering is stimulated by burning of the veld the preceding winter.

The flowers are mostly moderately sized, with tepals 20–40 \times 3–8 mm, but plants from Nsikeneni Mtn near Kokstad (Abbott 7051) are especially handsome, with unusually large, white to pale pink flowers, the tepals 50–55 \times 10–18 mm. The species is also variable in flower colour. Usually white or sometimes pale pink, or the outer tepals flushed pink beneath, individuals with bright cyclamen pink flowers, sometimes with a white centre, occur in some populations. These striking colour morphs are relatively rare but have been recorded in the Eastern Cape from the Amatola Mtns and between eNgcobo and Kokstad, and in KwaZulu-Natal from Nkandla.

Diagnosis and relationships: distinguished from *Anemone fanninii* by its smaller stature, with smaller, mostly sparsely hairy leaves, the blades (40–)60–100(–180) mm diam. and lobed less than halfway, thinly pubescent above and glabrescent or thinly pubescent (rarely densely villous) beneath, mainly along the nerves, and mostly solitary-flowered scapes up to 200 mm long. The sepals are \pm monomorphic, the outer typically only thinly sericeous beneath. *A. fanninii* is a much more robust species with larger, densely velvety leaves 150–350 mm diam., and mostly 2 or 3-flowered inflorescences on stout scapes 200–800 mm long. The sepals are always distinctly dimorphic with the outer series broader than the inner and \pm densely sericeous or villous beneath.

Specimens of *A. caffra* from the Eastern Cape Drakensberg and southern Lesotho (viz. Nienaber 1014, Schmitz 8848, Strever 1234, Victor 1591) have the younger leaves (especially the lower surface) more densely pubescent than usual and have been confused with *A. fanninii*, especially individuals with two flowers

per stem, but are readily distinguished from that species by their much smaller, shallowly lobed leaves with relatively fewer (<10), proportionally larger primary teeth along each side of the lobes, and their generally shorter stature. The mature leaves in these populations are also not nearly as densely villous beneath as *A. fanninii*. We have not noticed any differences between the two species in the filaments (purportedly strongly expanded basally in *A. caffra*) nor carpel vestiture (basal hairs not distinctly shorter in *A. fanninii*) reported by Ziman *et al.* (2006).

The two species are essentially parapatric, with *A. caffra* distributed mainly south and east of *A. fanninii*, often at lower altitudes, but both occur around Polela, Qachas Nek and Mt Ayliffe, although they have never been recorded growing together.

History: *Anemone caffra* is one of many botanical novelties introduced to science by Christian Frederick Ecklon (1795–1868) and Carl Ludwig Zeyher (1799–1858). Arriving independently but almost simultaneously in Cape Town, the two Germans turned to plant collecting as a profession, both separately and together. In October 1831 they undertook a joint expedition to the present Eastern Cape, reaching as far as Queenstown, on which they encountered *Anemone caffra*. On their return to Cape Town the following year, Ecklon left for Germany and the Hamburg Botanic Garden to set about sorting their vast collection of material and the preparation of a joint publication on it, the *Enumeratio plantarum Africae australis extratropicae*. It is here that *Anemone caffra* was formally described in the genus *Pulsatilla*. The species was collected more-or-less simultaneously by another German, Johann Franz Drège (1794–1881), a trained horticulturist and active plant collector who had arrived in Cape Town in 1826. Drège undertook an extensive expedition into the Eastern Cape at the end of 1831 in the company of his apothecary brother Carl, finally returning to Cape Town in January 1836 (Glen & Germishuizen 2010). The two brothers collected the species on the Katberg in November 1832, and it was subsequently collected by many of the botanically inclined travellers to the eastern districts of the erstwhile Cape Colony during the latter half of the nineteenth century.

Drège listed the species as *Anemone alchemillifolia* in his *Zwei pflanzengeographische Documente* (Drège 1843). This was evidently a manuscript name given it by the Prussian Botanist Ernst Meyer, who wrote an introduction to the work. The species was subsequently published under Meyer's preferred but nomenclaturally illegitimate name by Pritzl (1841), who referred to both initial collections made by Ecklon & Zeyher and by Drège.

Minor variants among later collections from new localities in the Eastern Cape were seized upon as taxonomically significant entities by the Frankfurt botanist Ernst Huth (1896), who recognised var. *schlechteriana* for plants with smaller tepals (\pm 20 mm long) collected in January 1896 on Mt Ntsizwa near Kokstad by the botanist Rudolf Schlechter (1972–1925), and var. *grandiflora* for a collection with larger tepals (\pm 35 mm long) and lacinate involucre bracts made near Baziya,

west of Umtata, by the missionary Leopold Richard Baur (1825–1889) sometime after 1873. It was during this year that Baur was visited at his mission station in Baziya by the Port Elizabeth businessman and amateur

botanist, Russell Hallack (1824–1903), who encouraged him to botanise the area and to send his collections to Peter MacOwan (1830–1909), principal of Shaw College in Grahamstown and expert on the regional flora.



FIGURE 3.—*Anemone caffra*. Artist: Auriol Batten. [*Flowers of southern Africa*. Fransden, Fourways. (1986)].

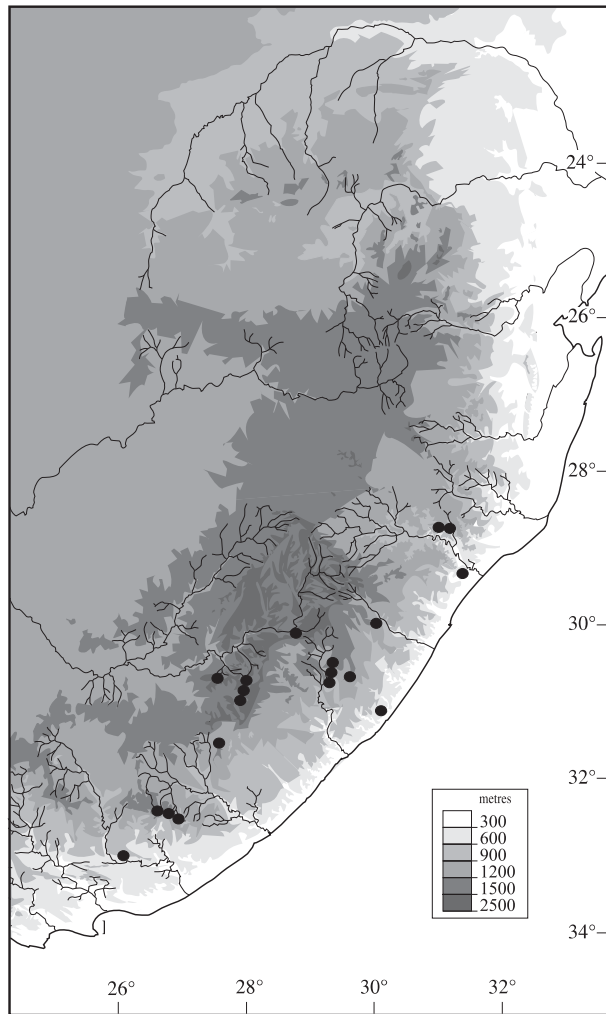


FIGURE 4.—Distribution of *Anemone caffra*.

Another form with less deeply lobed leaves was described as var. *pondoensis* by the Berlin botanist Eberhard Ulrich from two unlocalised and undated collections from Pondoland (Eastern Cape) made respectively by the medical practitioner and naturalist Franz Bachmann (1856 to ±1916) and one C. Beyrich, about whom nothing is known. Bachman spent only a year in Pondoland, over the period November 1887–November 1888, and would have collected the species during this time.

The first record of *Anemone caffra* outside of the Eastern Cape appears to have been made by John Medley Wood (1827–1915), Curator of the Durban Botanic Garden, who encountered it at Entumeni Mission south of Eshowe in KwaZulu-Natal in April 1888. It has now been collected from a few other localities in the province, but is still best known from the mountains of the Eastern Cape.

Ethnobotany: the species is used medicinally by Xhosa and Zulu as an emetic or an enema to treat biliousness (Watt & Breyer-Bandwijk 1932) and the powdered root is used as a snuff to relieve headache and toothache (Hutchings 1996). A decoction of the plant has purgative properties and is used in combination with *Athrixia heterophylla* (Asteraceae) to treat mental disease; the root is used as a love potion and to encourage breast development in young maidens (Batten 1986).

Additional specimens

LESOTHO.—**3028** (Matatiele): after hilltop Ha Mokife, (–BB), steep grassy slopes near village, 28 Oct. 1979, *M. Schmitz* 8848 (PRE); Qachasnek, 1 970 m, (–BB), dolerite outcrop W of road, flowers white, 4 Oct. 1988, *T. Strever* 1234 (NH).

KWAZULU-NATAL.—**2831** (Nkandla): Nkandla Forest, (–CA), 22 Sep. 1939, *J. Gerstner* 3600 (NH); Nkandla village, (–CA), petals white, pink outside, 7 Dec. 1963, *J.W. Morris* 397 (NU); Melmoth, Kataza, 3 000' [910 m], (–CB), S slope, 14 Jul. 1952, *H. Porter s.n.* (NBG); ± 10 km from Nkandla on Eshowe Road, (–CC), grassland, flowers white to deep pink, 27 Oct. 1996, *R. Williams & W. Menne* 1367 (NH). **2929** (Underberg): Polela, (–DD), Nov. 1905, *Fernando* 15 (NH); Mahwahqa Mtn, Sunset Farm, (–DD), 7 Nov. 1971, *M.A. Rennie* 39 (NU); 10 Nov. 1973, *O.M. Hilliard & B.L. Burt* 7169 (NU). **2931** (Stanger): Entumeni, (–AB), 12 Apr. 1888, *J. Medley Wood* 3961 (NH). **3130** (Port Edward): Umtamvuna Nature Reserve, Smedmore, 420 m, (–CC), grassland E of forest, white, tinged pink, 29 Sep. 1983, *A. Abbott* 1380 (NH); Umtamvuna Nature Reserve, 350 m, (–AA), vleimagrin, flowers white, red below, 29 Aug. 1985, *A. Abbott* 2713 (NH).

EASTERN CAPE.—**3027** (Lady Grey): near New England, Faskally Farm, N of farmhouse, 2 000 m, (–DA), foot of S slope of mountain, 9 Nov. 1995, *J.E. Victor* 1591 (PRE). **3028** (Matatiele): Naudesnek, Philipsrust, edge of wetland in open grassland, 2 010 m, (–CA), 18 Oct. 1988, *T. Strever* 1465 (NH); Farm Mountain Side, ± 28 km NW of Maclear, 2 010 m, (–CC), in kloof with stream, petals white to purple, 9 Nov. 1993, *S.P. Bester* 1579 (NH). **3029** (Kokstad): Kokstad, Nsiken Nature Reserve, Nsiken Mtn, 1 900 m, (–AB), grassland, dolerite, white to pale pink flowers, 9–12 Nov. 1996, *A. Abbott* 7051 (NH); Kokstad, Mt Currie Nature Reserve, (–AD), mountain side near stream, white flowers, 10 Nov. 1982, *T.A. Coleman* 1038 (NH); Mt Currie, 1 700 m, (–AD), 11 Sep. 1990, *P.B. Taylor* 149 (NU); Ongeluks Nek, (–CD), damp grassy slope, flowers white, 5 Dec. 1985, *O.M. Hilliard & B.L. Burt* 18664 (NU); Mt Insizwa [Ntsizwa], (–CC), flowers white or pink, 17 Nov. 1973, *O.M. Hilliard & B.L. Burt* 7294 (NU); Mt Ayliff, Ntsizwa Mtn, S slopes above pines, (–CD), flowers white to deep pink, 26 Oct. 1991, *E. Cloete* 1196 (NH); Ngele, Umsilo Cutout, 1 200 m, (–DA), flowers white tinged purple below, 15 Sep. 1990, *A. Abbott* 5345 (NH); Weza, Ngeli [Ngele], top of mountain towards Dakota Kop, 2 000 m, (–DA), moist grassland, white flowers tinged with pink, 3 Nov. 1997, *J. Arkell* 416 (NH); 'in graminosis prope' [grassland near] Kokstad, (–DB), Oct. 1883, *Tyson* 1568 (BOL, SAM); Dec. 1883, 'flores rosei' [rosy flowers], *W. Tyson* 1845 (PRE, SAM). **3127** (Lady Frere): R56 ± 17 km out of Elliot to Ugie, Farm Trenmore, (–BD), 8 Nov. 2000, *E.P. Nienaber* 1014 (PRE). **3128** (Umtata): ± 20 km NW of Ugie, Farm Fintana, 1 160 m, (–AA), 13 Sep. 1994, *S.P. Bester* 2935 (PRE); Farm Tsitsa, ± 14 km S of Maclear, 1 220 m, (–AB), petals white, outer with some pink, 20 Nov. 1993, *S.P. Bester* 1754 (NH). Tsolo, Ntywenka Pass, ± 4 500' [1 372 m], (–BA), highland sourveld, 17 Nov. 1945, *J.P.H. Acocks* 12165 (PRE); Engcobo [eNgcobo], Satans Nek, grasslands W of summit, (–CA), flowers ranging from white to cerise, 23 Oct. 1991, *E. Cloete* 1129 (NH); Cala, (–DA), slopes of kloof, Dec. 1942, *Whitworth s.n.* (BOL); Engcobo [eNgcobo], (–DA), flowers bright mauve-pink with white centre, 14 Oct. 1960, *L.F. Gibson s.n.* NBG883/60 (NBG); hills near Engcobo [eNgcobo], (–DA), 8 Oct. 1961, *Esterhuysen* 29159 (BOL). **3226** (Fort Beaufort): Katberg Pass, (–BC), Oct. 1963, *J.L. Sidey* 3793 (PRE). **3227** (Stutterheim): Keiskammahoek, Mtns N of Cata Forest Reserve, (–CA), level marshy areas, 4 Nov. 1948, *R. Story* 3658 (PRE); Dohne Peak, (–CB), Jan. 1894, *T.R. Sim* 1007 (NU); King William's Town, summit of Pirie, (–CD), Nov. 1893, 3 000' [910 m], *H.G. Flanagan* 2207 (PRE, SAM); King William's Town, Dontsa Pass, 3 000' [910 m] (–CA), grassy bank, flowers white, 14 Nov. 1961, *A. Batten s.n.* (NBG); Pirie, (–CD), Nov. 1892, *Sim* 110 (NBG, NU). **3326** (Grahamstown): Grahamstown, (–DB), Nov. 1897, *J. Glass* 1802 (SAM); Grahamstown Hills, (–DB), Oct. [without year], *P. MacOwan* 358 (SAM); Grahamstown, Featherstone Kloof, (–DB), 3 Oct. 1931, *J. Rennie & B. Rennie* 169 (BOL).

3. *Anemone fanninii* Harv. ex Masters in Gardener's Chronicle 25: 432, fig. 84 (1886) [*A. fanninii* Harv.: 2 (1868), nom. nud.]; Hooker: t. 6958 (1887); Ulbrich: 240 (1906); Killick: t. 1441 (1965); Ziman *et al.*: 209 (2006) [as '*A. fanninii* Harv.']. Type: South Africa, [KwaZulu-Natal], 'Natal', *Adlam sub Masters* 4/86 (K—JSTOR image!) [2 sheets: K000075962,

K000075963], holo.). [The two sheets comprise respectively leaves and flowers and are evidently portions of a single collection.]

A. fanninii var. *parviflora* Ulbrich: 241 (1906), syn. nov. Type: [KwaZulu-Natal], 'in montibus Maritzburg' [Pietermaritzburg], without date, *Adlam s.n. sub Macowan & Bolus 1023* (SAM, holo.!; BOL! [2 sheets], iso.).

A. fanninii var. *mafubensis* Beauv.: 327 (1914), syn. nov. Type: [Eastern Cape], 'Griqualand East, Mafube', Nov. 1907, *H. Jacottet 93* (G—JSTOR image! [3 sheets: G00023697], holo.).

Deciduous, rhizomatous perennial with woody rootstock 10–18 mm diam., covered with fibrous remains of leaf bases. *Leaves* rosulate, 2–5, emergent or fully-developed at flowering, palmately (5–)7(–9)-lobed or -parted, mostly halfway or more, blade 150–250(–350) mm diam., orbicular-cordate in outline, leathery, velutinous above, paler and densely villous beneath with nerves very prominent, margin bidentate, with 15–20 primary teeth along each side of lobes, teeth with conspicuous reddish mucro; petiole erect, rigid, 200–700 mm long, villous. *Inflorescence* simple, 2- or 3(4)-flowered, flowers lacking involucels, scape (200–)300–800 mm long, 4–6 mm diam., villous; involucral bracts 2–4(–6), entire or incised, 20–60 mm long, sometimes almost leaf-like with trifid blade; pedicels 70–300 mm long, villous. *Flowers* creamy white or flushed purplish on reverse, fragrant; sepals 12–20, ± dimorphic, narrowly elliptic to elliptic, 25–60 × 6–15 mm, obtuse or acute, outer series broader than inner and densely sericeous or villous beneath. *Stamens* centrifugal; filaments linear, 5–7 mm long, anthers 0.8–1.5 mm long, yellow. *Carpels* 7–9 mm long; ovary ovoid, ± 3 mm long, sericeous with hairs 1.0–1.5 mm long, style 4–6 mm long, subglabrous. *Achenes* not seen. *Flowering time*: mainly Oct. to Nov., rarely earlier, flowering best after a winter burn. Figure 5.

Distribution and ecology: *Anemone fanninii* is largely restricted to the eastern foothills and scarp of the central and northern Drakensberg in KwaZulu-Natal as far north as Witzieshoek in northeastern Free State; but is also recorded further south from Qachasnek in the southern Drakensberg and from Mt Ayliffé south of Kokstad in Eastern Cape (Figure 6). The species favours cooler, south-facing, grassy slopes, often along water courses or in seasonal seepages, from 600–3 000 m. Flowering is largely dependent on burning of the veld the preceding winter.

Diagnosis and relationships: closely allied to *Anemone caffra* but altogether more robust, with larger, thickly pubescent leaves, the blades 150–350 mm diam., velutinous above and densely villous or felted beneath, and mostly 2 or 3-flowered inflorescences on stout scapes (200–)300–800 mm long. The whitish sepals, sometimes flushed maroon on the reverse, are always ± distinctly dimorphic with the outer series broader than the inner and densely sericeous or villous beneath. *A. caffra* is a smaller species with mostly thinly hairy leaves (rarely densely villous beneath, especially when young), 40–130 (–180) mm diam., and 1(2)-flowered scapes up to 200 mm long, typically with ± monomor-

phic sepals, the outer mostly similar in size and shape to the inner and only thinly, or at most moderately, densely sericeous beneath. The flowers in both species vary significantly in size. We are not able to corroborate any differences between the two species in the filaments (purportedly strongly expanded basally in *A. caffra*) and in the carpel vestiture (basal hairs not markedly shorter than median in *A. fanninii*) reported by Ziman *et al.* (2006).

Anemone fanninii was deservedly described by Masters (1886) as a 'magnificent perennial' but despite his urgings it has not entered into general cultivation. Killick (1965) too recognised its promise as a garden subject but sadly observed that it had proven very difficult to cultivate away from its natural habitat. His hopes that horticulturists might soon discover its cultural requirements have so far remained unfulfilled.

History: the largest of the African anemones, *A. fanninii* commemorates local farmer George Fannin (1832–1865), who collected it in September 1863, shortly before his death, at his farm The Dargle in the KwaZulu-Natal midlands. Renditions of the name in the feminine form '*fanniniae*' are thus incorrect. Fannin took a great interest in the plants around his farm, sending many interesting specimens to botanist and fellow Dubliner, William Harvey (1811–1866) at Trinity College, who reciprocated by naming several of the novelties after Fannin. Duplicates of Fannin's herbarium specimens are housed at Kew, the KwaZulu-Natal Herbarium, and at Trinity College. Unfortunately, Harvey's publication of the name *Anemone fanninii* in the second edition of his *Genera of South African Plants* (Harvey 1868) lacks a description and the name was only formalised by the publication of the description of a later collection (Masters 1886). This collection, from Polela in the Drakensberg foothills, stems from material gathered in December 1885 by the English horticulturist Richard Adlam (1853–1903), then resident in Pietermaritzburg. Seed that Adlam sent to England was flowered and the cultivated plant was described and illustrated in *The Gardener's Chronicle* Vol. 25 (Masters 1886). Maxwell Masters (1833–1907), editor of the magazine, provided the formal description and arranged for the fine engraving and is thus credited with the publication of the species. Masters sensibly lodged the flowers and leaves of the Adlam material in the Kew herbarium, and they comprise the type of the name, not Fannin's collection as indicated by Ziman *et al.* (2006), who erroneously attribute the species to Harvey.

Adlam, a fluent writer, contributed a popular article in the same issue of the *Gardeners' Chronicle* (Adlam 1886), vividly describing his rediscovery of the species. 'Next morning I started alone across country in search of a much talked-of plant', he writes, making it clear that his encounter was not a fortuitous one—news of this handsome anemone had clearly percolated among British horticulturists. 'The morning mists [after a heavy storm the previous night] still float and sweep along the higher ground, alternately hiding and disclosing the cattle feeding on a thousand hills. My path led along a hill side, where *Anemone fanninii* [*sic*] grew very strongly, flower stems 5 feet high, leaves 2 feet in diameter and flowers 2 inches across. Twenty years ago Harvey noted

it as a noble plant, yet I am not aware of its being in cultivation at home'. This was not quite true, for John Medley Wood (1827–1915), Curator of the Botanic Gardens in Durban, had sent living material of the species that he collected on the farm Ismont in 1883 to Kew. Received in June 1885, it was cultivated in a cool pit and flowered two years later, in April 1887, when it was beautifully illustrated in colour by the Kew artist Walter Hood Fitch (Hooker 1887).

Another, undated herbarium collection with smaller flowers collected by Adlam from the hills near Pietermaritzburg (possibly even from Fannin's original locality near The Dargle) and preserved in the South African Museum Herbarium (SAM), was described as var. *parviflora* by the Berlin botanist Eberhard Ulbrich (1906). A second variety, var. *mafubuensis* Beauv. (1914) is based on several beautifully pressed specimens collected at Mafube near Matatiele in the southern Drakensberg



FIGURE 5.—*Anemone fanninii*, Killick 3532 (PRE). Artist: Cythna Letty. [*Flowering Plants of Africa* 37: pl. 1441 (1965)].

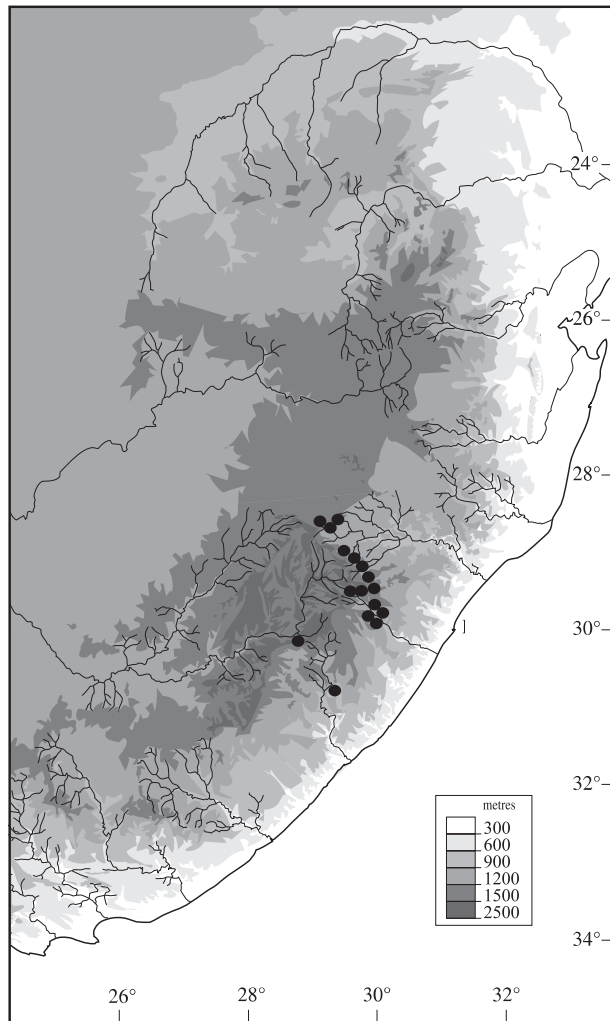


FIGURE 6.—Distribution of *Anemone fanninii*.

by H el ene Jacottet, sister of Dr Lautr e and the Rev. Edouard Jacottet. The unusually short flowering stems of these plants that attracted the attention of Gustave Beauverd (1867–1942), curator of the Boissier herbarium in Geneva, were artificially abbreviated by Mille Jacottet in her pursuit of neatness and do not, as Beauverd thought, represent a naturally short genotype at all!

Ethnobotany: the roots are used in traditional Zulu medicine, probably in the same way as *A. caffra* (Hutchings 1996). The sap is recorded as acrid—like many members of the family the species presumably contains the bitter glycoside ranunculin, which is enzymatically converted when the fresh plant is bruised to protoanemonin, a toxic oil with an acrid taste that causes blistering of human skin.

Additional specimens

FREE STATE.—**2828** (Bethlehem): Elands River valley, near Mont aux Sources, (–DB), 1894, *Flanagan 2126* (BOL, NBG, NH, PRE, SAM); Mont aux Sources, 6 000' [1 820 m], (–DB), 27 Oct. 1897, *A. Bolus sub Guthrie 3974* (NBG); Goodoo Pass, (–DB), loose slope on veld, mixed with bracken fern, 15 Sep. 1915, *J.W. Bews 335* (NBG); Witzieshoek, scenic road, 8 500' [2 580 m], (–DB), grassy slopes, 9 Nov. 1969, *A. van der Zeyde s.n.* (NBG); Witzieshoek, 1 900 m, (–DB), damp, sheltered by rocks, 15 Sep. 1986, *A.G. Paton 305a* (PRE).

KWAZULU-NATAL.—**2828** (Bethlehem): [Natal National Park], Mahai River, (–DB), 26 Nov. 1924, *E.E. Galpin 10394* (PRE); near

Mahai Falls, (–DB), 2 Feb. 1955 [vegetative], *D. Edwards 580* (NU); Royal Natal National Park, (–DB), moist localities, Aug. 1964, *W.R. Trausel 276* (NU); Tugela Gorge, (–DB), 24 Aug. 1950, *B.E. Martin 448* (NBG). **2829** (Harrismith): Oliviershoek, (–CA), 11 Dec. 1980, *H.J.T. Venter 8486* (PRE); Cathedral Peak area, (–CC), steep slopes recently burned, Jul. 1946, *Esterhuysen 12923* (BOL). **2929** (Underberg): approaches to Champagne Castle, (–AB), Oct. 1947, *Whitworth s.n.* (BOL); Tabamhlope [Ntabanhlope], 6 000' [1 820 m], (–BC), 14 Oct. 1907, *J. Wylie com. J.M. Wood 10595* (NU, PRE); [Kamberg] Farm Culvers, 6 000' [1 820 m], (–BC), Dec. 1920, *F.A. Rogers 28266* (NBG, PRE); Giants Castle Game Reserve, (–BC), 20 Dec. 1987 [vegetative], *A.B. Cunningham 2719* (NU); Loteni Nature Reserve, (–BC), edge of watercourse, 9 Oct. 1978, *A.J. Phelan 139* (E, NU); 13 km from Himeville to Sani Pass, (–CB), Sep. 1973, *T.H. Arnold 530* (NH); Cobham Forest Station, Ndlovini, Frontbeck, 6 000' [1 820 m], (–CB), 8 Nov. 1980, *O.M. Hilliard & B.L. Burt 13363* (NU); Sani Pass, midway up pass along stream, (–CB), 1 Nov. 2006, *J.C. Manning 3076* (NBG); Impendhle, Deepdale, (–DB), Oct. 1918, *T.R. Sim s.n. PRE54549* (PRE); Impendhle, (–DB), 15 Nov. 1924, *C.E. Levett 89* (NH); 4 km before Impendhle after Nottingham Road, (–DB), burnt open grassveld, Sep. 1973, *T.H. Arnold 521* (PRE). **2930** (Pietermaritzburg): The Dargle, (–AC), Sep. 1863, *G.F. Famin sub J. Sanderson 1170* (NH); Kunhardt's farm, 21 km from Merrivale on Boston Rd, (–AC), 1982, *C. Kunhardt 147* (NH); near Richmond, (–AC), 25 Oct. 1906, *J. Medley Wood 10 844* (NH); Byrne Valley, Minerva Private Nature reserve, 1 478 m, (–AC), 19 Oct. 2000, *R.N. Ntuli 204* (NH). **3028** (Matatiele): Qachas Nek, 6 000' [1 820 m], (–BA), mountain grassland, 30 Sep. 1962, *R.G. Strey 4316* (NH). **3030** (Port Shepstone): [Mid Illovo], Ismont, (–AB), 2 000' [600 m], April 1883, *Medley Wood 317* (SAM). Uncertain locality: Yorkshire Wolds, edges of bush near streams, Sep.–Oct. 1918, *J. Thode s.n. STE4835* (NBG); Spitzkop, Emongweni bushy places near streams, juice acrid, Oct. 1890, *J. Thode s.n.* (NBG, NU).

EASTERN CAPE.—**3029** (Kokstad): Clydesdale, (–BA), Dec. 1884, *W. Tyson 2009* (BOL, SAM); Mt Ayiliffe, (–CD), *M. Courtney-Latimer s.n.* [photo only] (NBG).

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