

ASPHODELACEAE

TRACHYANDRA ARENICOLA AND *T. MONTANA*, TWO NEW SPECIES FROM SOUTH AFRICA

INTRODUCTION

Trachyandra Kunth is a genus of ± 50 species distributed throughout sub-Saharan Africa. It is centred in the southern African winter rainfall region, with three or four species extending into tropical Africa, one as far north as Ethiopia (Smith & Van Wyk 1998). *Trachyandra* is distinguished from other genera of Asphodelaceae by its soft-textured leaves and short-lived, white or pinkish flowers with a deciduous perianth and \pm scabrid filaments (Obermeyer 1962). The seeds appear to be highly characteristic, developing distinctive idioblasts containing bundles of needle-like crystals. These are visible as small, raised excrescences in the tissue of the enveloping funicular sarcotesta, which is a family characteristic of Asphodelaceae.

Three sections are currently recognized within the genus (Obermeyer 1962). In sections *Liriothamnus* and *Glandulifera* the first leaves of each growth cycle are not reduced to membranous sheaths and thus grade into the

foliage leaves, the roots are slender and wiry, and the filaments are monomorphic. Species in section *Glandulifera* are invariably sparsely or densely glandular-pubescent and those in section *Liriothamnus* either glabrous or pubescent but not glandular. Section *Trachyandra* is readily distinguished from the other sections by having the first leaves of each growth cycle reduced to sheathing membranous or papery cataphylls that surround the base of the annual shoots, by its \pm swollen or tuberous roots, and by often having dimorphic filaments. It is the largest section of the genus, comprising around half of the species, most of which are endemic to the winter rainfall parts of the Western Cape and Northern Cape.

Just over 30 species are endemic or near-endemic (Obermeyer 1962; Manning & Klopper 2006). Two species have been described since the last revision of the South African members of the genus (Obermeyer 1962), both from the winter rainfall parts of the Western Cape and Northern Cape (Manning 1990; Perry 1990).

Another two species are described here. *Trachyandra montana* was recently discovered on the middle and upper slopes of Jonaskop, the highest peak in the western part of the Riviersonderend Mountain range in the southwestern Cape. *Trachyandra arenicola*, from the arid west coast of Namaqualand and adjacent Western Cape, was first collected in 1925–1926 and later in 1945 but confused with other species in the genus (Obermeyer 1962). Several recent gatherings made over the past few decades, however, provide ample evidence of its distinctness.

***Trachyandra montana* J.C.Manning & Goldblatt, sp. nov.**

Geophyta decidua, 100–200 mm alta, radicibus gracilibus tuberibus fusiformibus distalibus ferentibus, foliis 1 vel 2 ligulatis firmis scabridis 5–10 mm latis, inflorescentibus simplice pedunculis dense pubescentibus, floribus albis nervo medio aurantiacis, tepalis ad basem medioque pubescentibus, ovario sparse scabrido ovulis 6 in quoque loculo, capsulis dense pubescentibus erectis 6–7 × 4–5 mm.

TYPE.—Western Cape, 3319 (Worcester): Riviersonderend Mtns, Jonaskop, along road to summit at 1 200 m, (–DC), 18 October 2005, *J. Manning 2995* (NBG, holo.; MO, iso.).

Deciduous geophyte, 100–200 mm high. *Rhizome* short, horizontal; roots slender, lanate, reddish brown, developing tubers ± 100 mm from base, tubers 30–40 × 5–8 mm. *Cataphylls* surrounding shoots as well as leaf and scape bases, papery, brown, 5–10 mm long. *Leaves* (1)2, linear-lanceolate, 200–300 × 5–10 mm, plane, firm-textured, somewhat twisted and flexuous, striate with raised, thickened veins, scabrid along veins, bright green flushed pink towards base. *Inflorescence* a simple raceme; peduncle flexed 20–40 mm from base then inclined to erect, terete, 1.5–2.0 mm diam. at base, densely pubescent with short, straggling hairs; raceme lax, few- to many-flowered, 40–80 mm long; bracts ovate-acuminate, membranous, pubescent at base and along margins and midrib; pedicels 8–10 mm long, suberect in bud but arcuate-spreading at anthesis, becoming erect in fruit and ultimately ± 10 mm long, pubescent. *Flowers* rotate, white with orange midribs, immaculate, opening in afternoon, fragrance unknown; tepals pubescent at base and along abaxial midrib, outer elliptical, 10–12 × 2.0–2.5 mm, inner obovate, 10–12 × 4–5 mm. *Stamens* suberect; filaments filiform, tapering below, white, retrorsely scabrid in upper two thirds, outer ± 7 mm long, inner ± 6 mm long; anthers yellow, ± 2 mm long. *Ovary* ovoid, ± 2 mm long, sparsely scabrid, green, with 6 ovules per locule; style erect, filiform, ± 6.5 mm long, white. *Capsule* subglobose, 6–7 × 4–5 mm, densely retrorsely scabridulous. *Seeds* tetrahedral, verrucose, black, ± 3 mm diam. *Flowering time*: October and November. Figure 3.

Distribution and habitat: so far known only from the middle slopes of Jonaskop at the western end of the Riviersonderend Mountains (Figure 4), *Trachyandra montana* is not uncommon on the drier, north-facing

slopes, occurring in stony sandstone in more open, rocky ground and along the roadside.

Diagnosis and relationships: the papery cataphylls and fleshy roots place *Trachyandra montana* in section *Trachyandra*, where it is closely allied to *T. hirsutiflora* (Adamson) Oberm., another southwestern Cape endemic. Both are characterized by apomorphic, unbranched, cylindrical inflorescences with densely hairy scapes lacking sterile bracts, firm-textured and striate, scabrid leaves, and pubescent capsules. *Trachyandra montana* is distinguished by its distinctive roots, which are initially slender and only develop fusiform tubers some distance along their length, by its two (or rarely just one) plane leaves 5–10 mm wide, surrounded at the base with chestnut brown cataphylls, its rather lax and inclined inflorescence, and its relatively small capsules 6–7 mm long. *Trachyandra hirsutiflora*, in contrast, has roots that taper from a swollen base, (2)3–5 linear-canaliculate leaves (1)2–5(–8) mm in diameter surrounded at the base by translucent cataphylls, typically a dense, stiffly erect inflorescence, and characteristically large capsules (8–)10–15 mm long. *Trachyandra hirsutiflora* ranges through the coastal mountains of the southwestern Cape, from the Piketberg to the Potberg (Figure 4), but has not been recorded from further inland on the Riviersonderend Mountain range. It favours sandy, often seasonally moist flats rather than the drier, rockier situations in which *T. montana* occurs, and flowers especially freely, sometimes prolifically, after fire.

Other material examined

WESTERN CAPE.—3319 (Worcester): Riviersonderend Mtns, Jonaskop, along road to summit at 1 200 m, (–DC), 10 January 2006 (fruiting), *J. Manning 2996* (NBG, MO).

***Trachyandra arenicola* J.C.Manning & Goldblatt, sp. nov.**

TYPE.—Northern Cape, 2917 (Springbok): flats below Anenous Pass, along road to Eksteenfontein, Farm Grasvlakte, deep red sands, (–DC), 28 July 2006, *J. Manning 3026* (NBG, holo.; K, MO, iso.).

Geophyta decidua, (100–)200–500 mm alta, radicibus pluribus leviter incrassatis decrescentibusque, foliis 150–200(–500) × 5–10(–30) mm, marginibus scabridulis retrorsis, ad basem cataphyllis papyraceis, inflorescentia erecta ramis 1 vel 2, laxe multifloris, pedunculo glabro vel pubescente, floribus albis maculo flavo ad basem tepalis, loculis ovulis 10–14 eodem, capsulis erectis 10–14 mm longis.

Deciduous geophyte, (100–)200–500 mm high. *Rhizome* short, vertical; roots several, slightly swollen and tapering, lanate, current season's complement without lateral rootlets, whitish, 5–6 mm diam. at base, previous season's complement developing feeder rootlets, brownish. *Cataphylls* ± 10 mm long, surrounding shoots as well as leaf and scape bases, papery, translucent greyish brown. *Leaves* (2–)4–12, lanceolate-falcate, 150–200(–500) × 5–10(–30) mm, plane, soft-textured and succulent, retrorsely scabridulous on margins, withered and twisted at tips at flowering time, glaucous

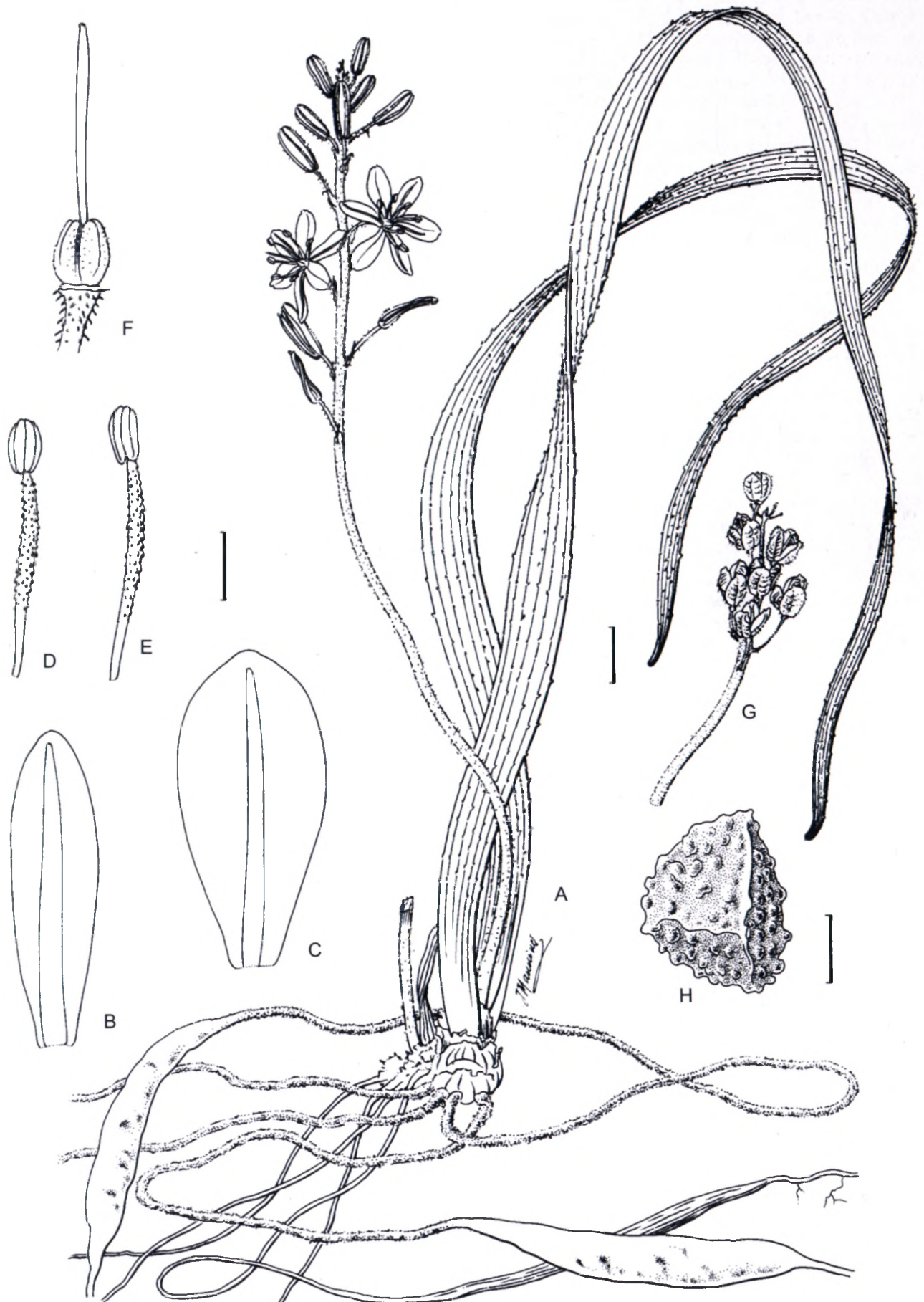


FIGURE 3.—*Trachyandra montana*, Manning 2995, 2996. A, whole plant; B–F, floral details: B, outer tepal; C, inner tepal; D, outer stamen; E, inner stamen; F, gynoecium. G, inflorescence; H, seed. Scale bars: A, G, 10 mm; B–F, H, 2 mm. Artist: John Manning.

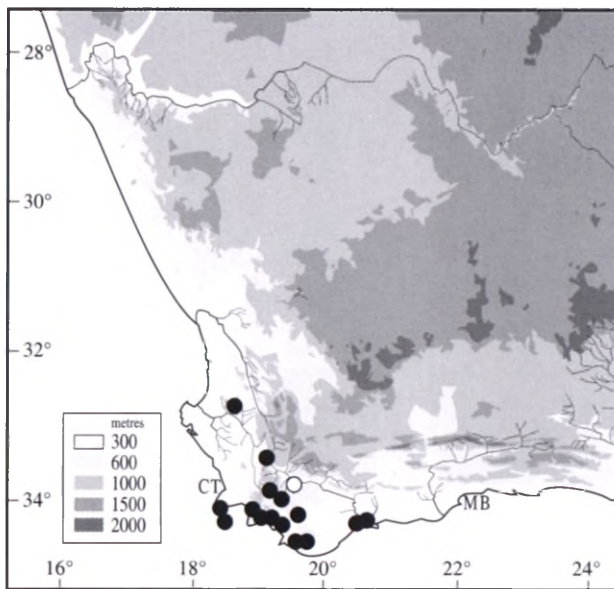


FIGURE 4.—Known distribution of *Trachyandra montana*, ○, and *T. hirsutiflora*, ●.

or dull green. *Inflorescence*: peduncle erect, sometimes becoming deflexed with age and in fruit, 3–7 mm diam. at base, green or flushed reddish, glabrous or pubescent with soft, straggling hairs; raceme, compound, lax, with one or two suberect branches, the lower sometimes with an additional accessory branch, usually several (up to 6) inflorescences per plant, many-flowered, 100–200(–600) mm long; bracts ovate-acuminate, 7–9 mm long, membranous, glabrous or pubescent along midrib, ciliate along margins in upper half; pedicels (10–)12–19 mm long, erect in bud but arcuate-spreading at anthesis, glabrous, sparsely retrorse-scabridulous, strigose, or pubescent with spreading hairs, becoming sinuate- or spreading-erect in fruit but not elongating further. *Flowers* rotate, white or flushed pink on reverse with greenish or greyish midribs, tepals each with greenish or bright yellow spot near base, opening \pm 13:00 and withering \pm 18:00, sweetly scented; tepals fused below for 1 mm, glabrous or pubescent adaxially at base and on midrib, outer oblanceolate, 10–13 \times 2.3–3.0 mm, inner obovate, 10–13 \times 3–4 mm, somewhat clawed in lower 3 mm and papillate-ciliolate along margins of claw. *Stamens* suberect; filaments filiform, tapering below, white or flushed pinkish in lower half, retrorsely scabrid or scabridulous except in uppermost 0.5–1.0 mm, outer 7–8 mm long, inner 8–9 mm long; anthers yellow, \pm 1.8 mm long at anthesis. *Ovary* ellipsoid, \pm 2 mm long, glabrous, green or greyish, with 10–14 ovules per locule; style erect, filiform, white, 10–11 mm long. *Capsule* ellipsoid, 10–12 \times 4–5 mm, glabrous. *Seeds* tetrahedral, \pm 2 mm diam., sparsely verrucose, pale reddish brown. *Flowering time*: mainly July and August, extending into September under favourable conditions. Figure 5.

Distribution and ecology: *Trachyandra arenicola* is scattered along the edge of the Namaqualand coastal plain wherever suitable areas of deep, sandy soils occur. Populations have been recorded from the Anenous Flats at the southern fringe of the Richtersveld in the north, as far south as Wallekraal in Northern Cape, and then much farther to the south around Klawer and Graafwater in

Western Cape (Figure 6). Plants are locally common on sandy flats or in duneveld, sometimes numbering hundreds of individuals. Like most species in the genus, the flowers open in the afternoon and wither the same evening. They are pleasantly scented.

Diagnosis and relationships: in its relatively robust stature, lanceolate leaves, and sparsely branched inflorescence, *Trachyandra arenicola* most closely resembles *T. ciliata* (L.f.) Kunth and *T. falcata* (L.f.) Kunth in section *Trachyandra*. The bracts in the immature inflorescences of these three species are closely imbricate, and the young racemes of *T. ciliata* and *T. falcata* were vividly likened to ears of corn by Obermeyer (1962). These characteristic young inflorescences make the latter two species useful as a vegetable under the Afrikaans vernacular name *veldkool*. On the basis of these several features it seems likely that the three species are immediately related.

Trachyandra arenicola is distinguished from *T. falcata* by its more slender stature, laxer inflorescences with \pm concolorous bracts, and especially by lacking the amplexicaul peduncular bract diagnostic of *T. falcata*. The latter is an altogether more robust species with a dense inflorescence, characteristically with the outer half of the bracts suffused dark brown. In addition, the roots of *T. falcata* are far more numerous, slender, and not swollen. The two species are ecologically distinct, with *T. falcata* favouring stony, often granitic slopes, and *T. arenicola* restricted to sandy flats. From *T. ciliata* it is immediately separable by its erect, not trailing or creeping inflorescences (although the older inflorescences tend to topple over and become decumbent in fruit), its erect, not pendent fruits, and by the shorter bracts, 7–9 mm long vs 10–16 mm. *Trachyandra ciliata*, like *T. arenicola*, is also commonly encountered on sandy coastal flats but is much more widely distributed, extending from southern Namibia through the coastal areas of Western Cape as far east as Bathurst in the Eastern Cape (Figure 6).

All three species may be variously pubescent or \pm glabrous, with both forms co-occurring in certain localities. In *Trachyandra arenicola* the variation in vestiture is geographical. Populations from Namaqualand in Northern Cape are glabrous apart from the sparsely scabridulous pedicels, whereas those from the south, around Klawer and Graafwater, are densely pubescent on the peduncles and pedicels, and the tepals are also partially pubescent. The capsules in the southern populations tend also to be slightly more broadly ellipsoid. Early collections from the southern populations were identified as *T. falcata* by Obermeyer (1962), and a single, incomplete collection from Namaqualand she assigned to *T. ciliata*.

Other material examined

NORTHERN CAPE.—2917 (Springbok): Anenous Flats, Farm Grasvlakte, red sands, (–DC), 6 October 1991, *J. Manning* 1032 (NBG); 23 August 1992, *P. Goldblatt & J. Manning* 9287 (MO, NBG). 3017 (Hondeklipbaai): Farm Avontuur, 15 km inland from Hondeklipbaai, deep, loose sand, (–AD), 29 August 1990, *P.A. Bean & M. Viviers* 2558 (BOL); 1 km from Wallekraal, red sand flats, (–BC), without date, *P.L. Perry* 3869 (NBG); 1.5 km along Wallekraal road

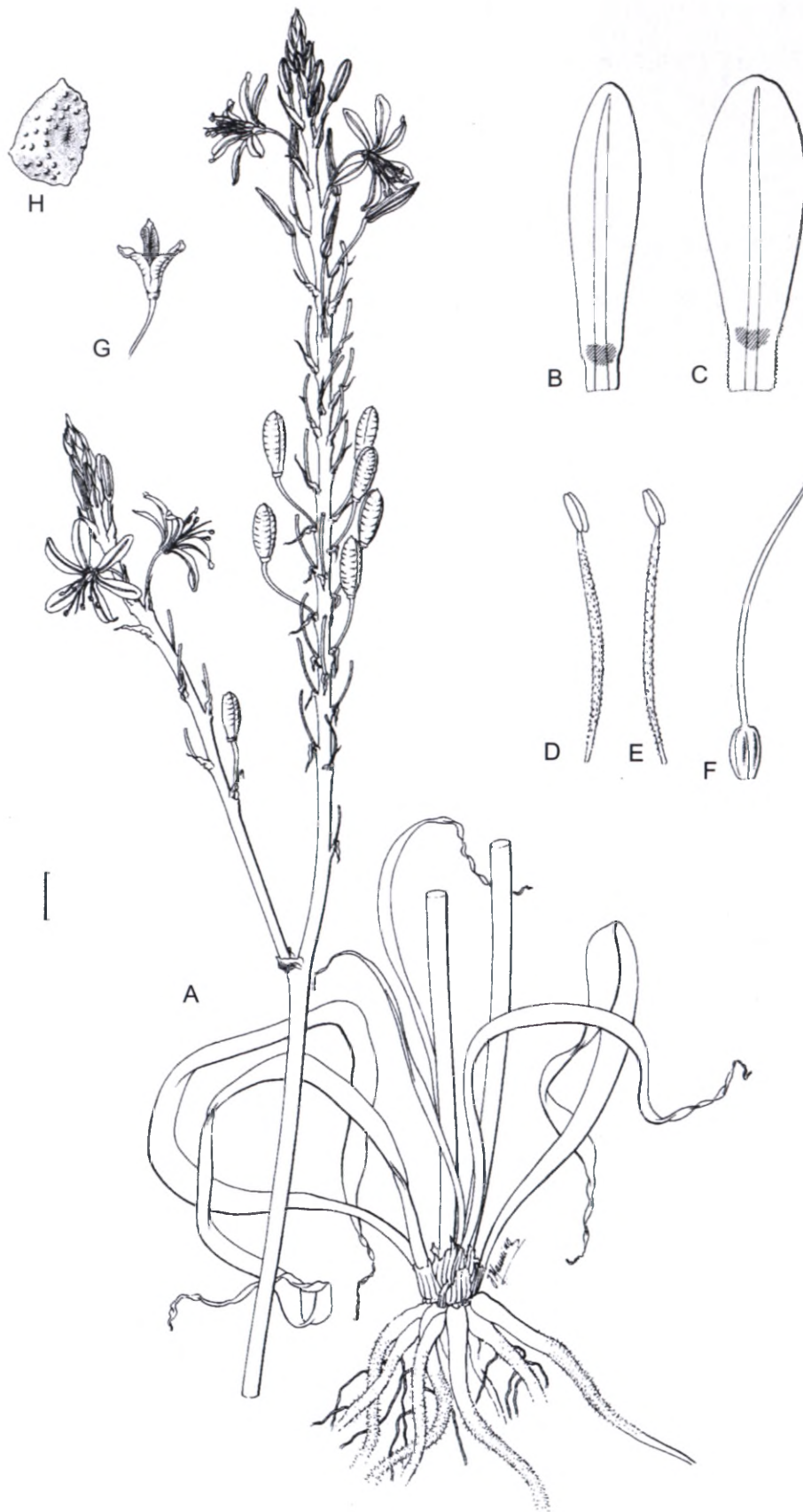


FIGURE 5.—*Trachyandra arenicola*, Manning 3026. A, whole plant; B–G, floral details: B, outer tepal; C, inner tepal; D, outer stamen; E, inner stamen; F, gynoecium; G, capsule; H, seed. Scale bar: A, G, 10 mm; B–F, 2 mm; H, 1 mm. Artist: John Manning.

to Spoegrivier, red sands, (–BC), 6 October 1991, *J. Manning 1039*; Farm Hardekoppie, northwest of Kotzesrust, consolidated sand. (–DC), 180 m, 29 September 1987, *C. Reid 1299* (BOL, PRE); 10.5 km west of Kotzesrust, sandy slope, (–DD), 28 August 2001, *P. Goldblatt & L. Porter 11778* (MO, NBG). Without precise locality: Namaqualand, 1925–6, *G. Meyer s.n.* (NBG).

WESTERN CAPE.—3118 (Vanrhynsdorp): ± 50 km west of N7 highway between Clanwilliam and Vanrhynsdorp, 6.5 km north of turnoff to Klaver, sandveld, (–DA), 7 August 1985, *K. Steiner 906* (NBG); 20 km SSE of Klaver, Sandkraal, (–DC), without date, *P.L. Perry 3580* (NBG); Klaver, (–DC), 2 September 1945, *W.F. Barker 3638* (NBG).

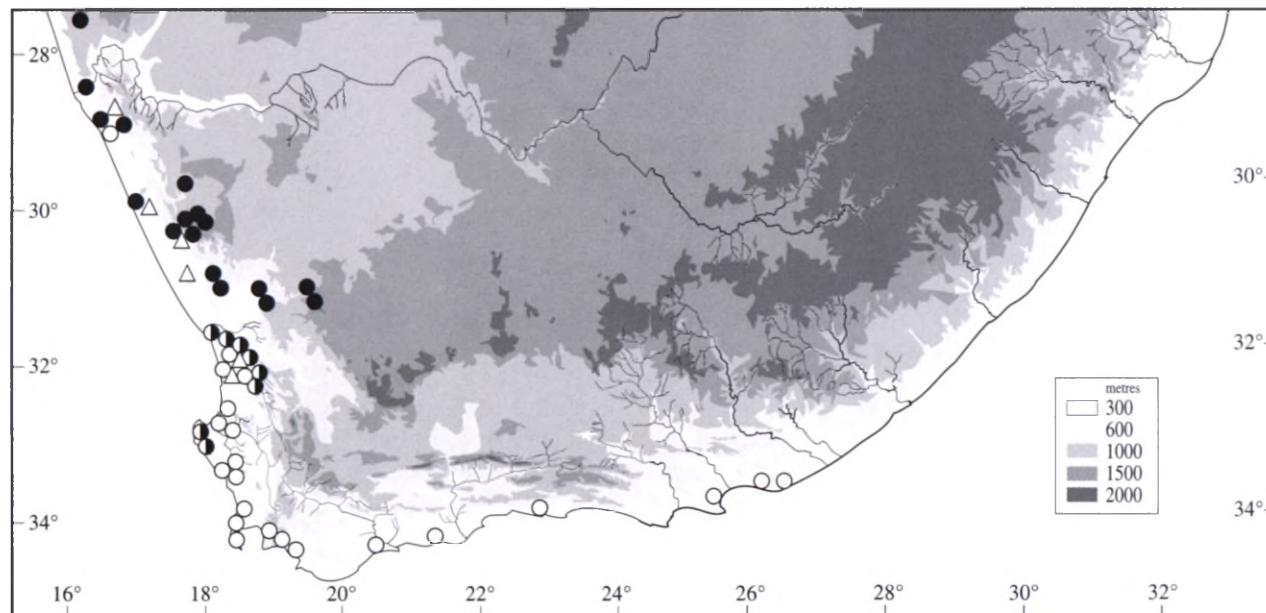


FIGURE 6.—Known distribution of *Trachyandra arenicola*, \triangle ; *T. ciliata*, \circ ; and *T. falcata*, \bullet .

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