A revision of the genus Anginon (Apiaceae)

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Anginon, a hitherto poorly known genus of woody Apiaceae endemic to southern Africa, is revised. Field studies over several years have shown that 12 species can be recognised, of which five are newly described: *A. ternatum, A. fruticosum, A. pumilum, A. tenuior* and *A. intermedium*. The new combination *A. strei* is made to transfer *Sonderina strei* to Anginon, with which it shares the woody habit and heavily cutinised outer cell walls of the fruit epidermis. A formal taxonomic presentation is included, together with a key to the species, correct nomenclature, typification, descriptions and distribution maps.

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Introduction

*Anginon* Raf. is a poorly known genus of woody Apiaceae endemic to southern Africa. In the Flora Capensis, Sonder (1862) originally included two species in his new genus *Rhyticarpus*, but Burtt (1988) reinstated the older generic name and listed (Burtt 1991) seven species in his checklist of southern African Apiaceae. The woody habit, highly modified phyllodinous leaves and peculiar fruit structure have been discussed by Briquet (1897a, b), Wolff (1910), Burtt (1991) and in more detail by Van Wyk et al. (1997). These characters are generally useful to distinguish the genus, but the identification of the species presents much difficulty to herbarium taxonomists without field experience. As a result of extensive studies over a period of several years, the species are now much better known and our revision is presented in this paper. Twelve species are recognised, of which five are described as new. In view of the relatively small size of the genus, formal infrageneric groups are not considered necessary, but in the revision below, the species are arranged according to the results of a cladistic analysis (Fig. 13 in Van Wyk et al. 1997).

Anginon Raf.


Robust to slender, sparse or much-branched (rarely un-
branched) woody shrubs or shrublets, 0.7-4 m high (including inflorescences); mature parts (stems, leaves or at least inflorescences) conspicuously glaucous in some species. Stems rigid, mostly branched, rarely single at the base and branched higher up, leafy from the base, from the middle or only in upper parts of plant (juvenile leaves may persist at the base), rarely with persistent petioles; bark variable, old parts grey to black and mostly rough due to remains of leaf bases, younger parts light brown to dark brown and youngest parts frequently reddish brown and more or less smooth. Leaves phyllocladous and arranged spirally in groups on short or long shoots, relatively uniform or variable; basal leaves alternate to ternate, with the leaflets rarely entire, mostly toothed; upper leaves laminate to needle-like, sometimes totally reduced to the petiole and/or rachis (junciform), undivided to much divided, with or without lamina, 16-346 mm long; petiole and rachis mostly adaxially grooved, without a groove in some species; glabrous or rarely with sparse papillate hairs along the margins and midrib. Inflorescences mostly apical on long shoots, rarely on short shoots, with primary, secondary or tertiary racemes; internodes short (then with the inflorescence short and compact) or long (then with the inflorescence long and sparsely branched); upper racemes terminate in compound umbels; lateral racemes terminate in compound or simple umbels; scale-leaves occasionally sterile and condensed, forming small groups within the inflorescence, or more usually dispersed and subtending the racemes and umbels, somewhat caducous, triangular to linear-triangular, 2-10 mm long; rays 7-82 mm long; involucre bracts triangular to linear-triangular, 1.0-4.6 mm long; involucel bracts similar in shape, 0.8-3.1 mm long. Flowers small, yellow, invariably bisexual; pedicels 1.0-10.7 mm long; calyx teeth triangular, 0.3-0.7 mm long; petals very widely ovate, 0.6-1.7 × 0.6-1.3 mm, inflexed part 0.3-1.0 mm long; resin ducts single or branched; filaments 0.7-2.2 mm long, the uppermost 0.1-0.3 inflexed in bud and rapidly narrowed to a fine point; anthers 0.5-1.0 mm long; ovary 0.5-1.6 mm long; stylodium 0.8-1.7 mm wide, 0.3-0.9 mm high; style 0.1-0.5 mm long. Fruit variable, ovate to widely depressed ovate, rarely widely obovate; mericarps usually rugose, rarely tuberculate or with small translucent dots (subtostomal cavities) on a smooth surface, 1.6-6.3 mm long, 0.6-2.4 mm broad; resin ducts mostly 6 in each mericarp, 2 ventral (one in each corner of the commissure), 4 dorsal (in furrows between the ridges), rarely (6-) 8-12 in each mericarp, then variously distributed around the endocarp. Chromosome number: 2n = 22!

Notes. All the species are woody shrubs or shrublets with basal leaves that differ markedly from the upper (mature) leaves. The basal leaves have wide laminas, while the laminas of the upper leaves are reduced to various degrees, so that in most species the petioles and/or rachises alone remain as terete, needle-like structures. The genus *Anginon* can thus be distinguished by the combination of a woody habit, reduced leaves (usually phyllocladous and often junciform) and fruit without ridges or wings. It also differs from all other genera (except *Gilia*) in the heavily cutinized outer walls of the fruit epidermis (see Van Wyk et al. 1997).

**Distribution.** The species of *Anginon* are widely distributed in the south-western part of southern Africa, including the eastern, southern, western and north-western parts of the Cape Province, and the southern part of Namibia (Figs 1 - 4).

**Key to the species of Anginon**

1. Mature parts green, never glaucous; total height of the plant (excluding the inflorescence) more than 0.8 m .................................................. 2

2. Mature leaves needle-like, junciform or divided (laminas absent), petals with branched resin ducts .3

3. Mature leaves predominantly terminating in flat laminas (if somewhat needle-like then at least some of the leaves with flat laminas); petals with unbranched (single) resin ducts ........................................ 5

4. Mature leaves with an adaxial groove, usually divided into two or more segments of unequal size (almost invariably junciform in a few populations); plants usually densely branched ....... 3. *A. fruticosum*

5. Branch ends thin, less than 1.5 mm in diameter; uppermost leaves with 3 flat entire leaflets; only from Pella Mountain in the northern Cape ........................................ 12. *A. jaarsveldti*
1. Anginon difforme (L.) B. L. Burtt


Note. For a detailed discussion of the typification of *A. difforme* see Burtt (1991), note on page 255. As he pointed out, there are three possibilities: 1. To choose the Linnaeus specimens (cult. hort. Uppsala, LINN 335.28!, see drawing in Burtt 1991, p. 255), even if these are most unsatisfactory as types; 2. To choose the Burman plate (Burman, 1739, tab. 71, Fig.1) as iconotype, even though there are no fruit on this specimen; 3. To select a neotype. LINN 335.28 is most likely *A. difforme*, but some doubt remains. Our study of seedling leaves and juvenile leaves of the various species showed that they are rarely diagnostically different (Van Wyk et al. 1997). The inflorescence and flowers on this sheet may have been added later. The Burman plate almost certainly depicts *A. difforme*, but here again we are not absolutely sure, because *A. fruticosum* at some localities closely resembles the plant in the plate. In our opinion, the most practical solution was to avoid any possible confusion by choosing a neotype (Fig. 5).


≡ *Rhytcarpus difformis* (L.) Briq. in Bull. Herb. Boiss. 5: 450 (1897); H. Wolff in Pflanzenr. Heft 43: 13, fig. 3, 175 (1910). – Type as above.


≡ *Oenanthe exaltata* Thunb., Prodr.: 50 (1794). – Lectotype (chosen by Burtt 1991): Cape, s. loc., Thunberg s.n. (UPS 7088).


Slender, sparsely branched, woody shrub, 1-3 m high; mature parts green, not glaucous. Stems usually
branched at the base, usually slender and leafless except for the upper parts of plant. Leaves relatively uniform; basal leaves binate with toothed leaflets; upper leaves junciform, almost invariably totally reduced to the petiole and/or rachis, (59-)121-210 (-325) mm long; petiole and rachis adaxially without a groove; lamina totally absent. Inflorescences apical on long shoots, sparse or congested, rarely with only primary racemes, mostly with secondary racemes; lateral racemes terminate in compound umbels, mostly with numerous condensed, sterile scale-leaves; scale-leaves 2-5 mm long; rays (10-)15-26 (-46) mm long; involucre bracts (1.0-) 1.2-2.7 (-4.6) mm long; involucel bracts (0.8-) 1.0-1.9 (-3.1) mm long. Flowers with pedicels (2.5-) 3.8-5.4 (-6.3) mm long; calyx teeth (0.3-) 0.4-0.5 (-0.6) mm long; petals very widely ovate, (0.8-) 0.9-1.1 (-1.7) × (0.7-) 0.9-1.1 (-1.2) mm, inflexed part 0.5-0.7 (-0.9) mm long; resin ducts branched; filaments 0.9-1.4 (-1.9) mm long, the uppermest 0.1 (-0.2) mm inflexed in bud; anthers (0.6-) 0.7 (-0.8) mm long; ovary (0.8-) 0.9-1.1 (-1.4) mm long; stylopodium (0.9-) 1.0-1.5 (-1.6) mm wide, (0.3-) 0.5-0.7 (-0.8) mm high; style (0.1-) 0.2 (-0.3) mm long. Fruit widely obovate, with pedicel somewhat intruding at the base; mericarps usually tuberculuate, (2.2-) 3.4-4.8 (-5.7) mm long, (1.1-) 1.3-1.9 (-2.4) mm broad; resin ducts (6-) 8-12. Chromosome number: 2n = 22! (voucher: Van Wyk 2950).

Notes. This relatively common species is easily recognized by the invariably undivided, junciform mature leaves (Fig. 5). The plants are usually sparsely branched and the mature parts (leaves, stems and inflorescences)
are green, never glaucous. *A. difforme* is widely distributed in the Cape Province (Fig. 1) and is mostly found in sandstone and quartzite areas, usually on steep rocky slopes.

**Material examined.** 2817 (Vioolsdorp): Summit of the Ploegberg complex (-CA), Viviers 2113 (JRAU). -2917 (Springbok): top of Nababiepsberg (-DB), Allison 183, 184 (JRAU), 185 (PRE), 186 (NBG), 187 (GRA). -3017 (Hondeliklippai): Sneeukoop (-BB), Pearson 5783 (GRA, NBG). -3018 (Kamiesberg): Kamiesberg Pass (-AC), Allison 129 (JRAU), 130 (PRE), 131 (NBG). -Van Wyk 3098 (JRAU); Kamiesberg (-AC), Pearson 6264 (BOL), Snijman 436 (NBG). -Rooiberg Mountain (-AC), Le Roux & Ramsey 820 (STE). -3318 (Cape Town): mountain slopes above Riebeek Kasteel, farm Remhoogte (-BD), Marsh 1020 (STE); Paardeberg (-DB), Gordon & Adamson 3668 sheet 1 & 2 (BOL), Hugo 3012 (PRE, STE); Pillans 6321, 7642 (BOL), Rycroft 2962 (NBG), Salter & Leighton s.n. sub. BOL 45234 (BOL); Paarl Mountain (-DB), Marloto 3478 sheet 1 & 2 (PRE); Prior s.n. sub. BOL 48191 (PRE). -3319 (Worcester); Roodezandberg (-AA), Adamson 1020 (BOL, PRE), Compton 7108 (NBG), Compton et al. s.n. sub NBG 1914/36 (NBG); Saron (-AA), Thode 4841 (STE); Witsenberg (-AC), Ecklon & Zeyher 2202 β (S); Tulbagh, Elendsrivier Mountain (-AC), Jackson s.n. sub. BOL 45258 (BOL); mountains near Tulbagh Kloof (-AC), Stokoe s.n. sub SAM 68022 sheet 1 & 2 (PRE); Nieuwkoop (-AC), Schlechter 7523 (BOL); Vogelville Mountains near Gouda (-AC), Esterhuysen 18839a (BOL, PRE); Worcester, near Hex River Valley (-BD), Thode s.n. sub NH 16326 (NH); Hex River Valley (-BD), Tyson 1881 (GRA); Bain’s Kloof (-CA), Grant 2214 (BOL); Audensberg (-CB), Esterhuysen 3415 (BOL, NBG). -3320 (MONTAGU): Montagu, Baden (-CA), Walgate s.n. sub BOL 24028 (BOL), Compton 18439 (NBG), Lewis 1794 (NBG); Kochmanskloof (-CC), Levyns 107 (BOL); Wolwekloof west of Swellendam (-CD), Taylor 9254 (STE); Tradouw Pass (-DC), Allison 200 (JRAU), 201 (PRE), Bond 203 (NBG); Zuurbaak Mountain (-DC), Galpin s.n. sub. BOL 4094 (PRE); Langeberg near Heidelberg (-DD), C.M. van Wyk 2628 (PRE); Langeberg, Witbooisriver (-DD), Burger 46 (STE). -3321 (Ladismith): Seven Weeks Poort (-AD), Adamson 3683 sheet 1 & 2 (BOL), Bohnen 689/2 (PRE, STE), Compton 4025 (BOL); Elandsberg, Ladismith (-AD), Wurb 1089 (NBG); Gamba Mountain (-BC), Bosshoff P81 (STE); Swartberg, Groenfontein (-BD), Vlok 48 (PRE); Garcia’s Pass (-CC), Esterhuysen 17032 (BOL), Levyns 2307 (BOL), Steyn 314 (NBG); Gysmanshoek Pass (-CC), C.M. van Wyk 703 (PRE, STE); top of Rooiberg Pass (-DA), Allison 69, 70 (JRAU), 71, 110 (PRE), 111, 112 (SAM). -3322 (Oudtshoorn): Cango valley (-AC), Britten 1735 (GRA), Moffett 208 (STE), 581 (PRE, STE), Hugo 34 (PRE, STE); Meiringspoort (-BC), Van Wyk 2965 (JRAU); Uniondalepoort (-CA), Allison 207 (PRE); Robinson Pass (-CC), Allison 49 (JRAU), 50 (K, NBG, PRE); Paardepoort (-CD), Allison 102, 103, (NBG), 104 (JRAU), 108 (BOL); George (-CD), Mitchell s.n. sub BOL 16093 (BOL), s.n. sub. BOL 48275 (PRE); Outeniqua Pass (-CD), Lewis 4866 (PRE, SAM); Langkloof (-CD), Le Roux 71 sheet 1 & 2 (PRE); Kleinplaat (-DC), Morze 2232 (PRE, STE); Wilderness (-DC), Compton 15557 (NBG). -3323 (Willowmore): Sypssteenberg (-AC), Esterhuysen 6322 (BOL); De Hoop (-CA), Van Wyk 2950 (JRAU); George to Oudtshoorn road (-CD), Allison 59 (JRAU), 60 (PRE); near Mispund (-CD), Fourcade 4261 (BOL, STE), Goldblatt 6793 (PRE, STE); Lang Kloof, E. of Keurbooms River (-CD), Fourcade 2501 (BOL, STE); De Vasselot near Grootbanke (-CD), Geldenhuyse 550 (BOL, PRE); The Crags (-CD), Compton 23598 (NBG); Joubertina, Voorkloof, Kouga-Dwarsriver (-DA), Manson 245 (PRE, STE), Kouga Mountain, Hoeree (-DB), Oelofsen 21 (PRE); Duine Field, Groot River (-DC), Fourcade 2460 (BOL); near Joubertina (-DD), Acoks 20016 (PRE), Allison 41-43 (JRAU), 45, 46 (PRE), 100, 101 (JRAU), Esterhuysen 21220 (BOL), Van Wyk 2944 (JRAU). -3325 (Port Elizabeth): Zuurberg National Park, Brandrug (-BC), Allison 36, 37 (JRAU), 38, 39 (PRE), 40, 97, 98 (NBG); 99 (GRA); Zuurberg National Park, Lot 16 (-BC), B-E. & M. van Wyk 35, 1235 (JRAU); Zuurberg (-BC), Holland 20 (GRA); Van Staden Mountain (-CC), Zeyher 2675 sheet 1 & 2 (PRE); Port Elizabeth Valley (-DC), Paterson 2210 (GRA). -3326 (Grahamstown): Grahamstown (-BC), Barker 550 (NBG), Britten s.n. sub GRA 7373 (GRA), Dyer 423 (GRA), MacOwan 455 (GRA), s.n. sub BOL 1124 (BOL); Paradise Kloof (-BC), Salisbury 346 (GRA); Rabbit Wood (-BC), Bayliss 6078 (NBG). -3420 (Bredasdorp): De Hoop (-AD), Allison 152 (JRAU), Lewis 5129 (NBG); Duivelshoeks River (-BB), Lewis 5942 (NBG); near Malgas (-BC), Bayliss BRI. B. 915 (PRE); near the Potteberg (-BC), Esterhuysen 23299 (BOL); Potteberg (-BC), Maguire 2608 (NBG), Burgers 2017 (STE); Bredasdorp, farm Bronkvlie -(-CA), Van Breda 1634 sheet 1 & 2 (PRE); Nachwacht (-CA), Smith 4249 sheet 1 & 2 (PRE). -3421 (Riversdale): Vermaaklikheid (-AC), Bohnen 5872 (PRE, STE); Stillbay, Olive Grove Farm (-AD), Bohnen 5811.1 (STE); Gouritz Bridge (-BB), Comp 23531 (NBG, STE), Lewis 2518 (BOL, NBG). -3422 (Mossel Bay): Belvedere (-BB); Duthie 726 (GRA, STE). -3423 (Knyasa): Plettengberg hill (-AB), Phillips s.n. sub SAAS 1060 (PRE). -3424 (Humboldspark): Kromme River bridge (-BA), Fourcade 5981 (BOL, STE); Humboldspark (-BA), Rogers 3005 (NBG). Without precise locality: Burtt-Davy 11911 (PRE); Doubtful locality: East London, Pearson 1518 (NBG).
2. Anginon ternatum Allison & Van Wyk, sp. nov.


Robust, sparsely branched, woody shrub, up to 4 m high; mature parts green, not glaucous. Stems usually branched at the base, slender and leafless except for the upper parts of plant. Leaves relatively uniform; basal leaves bivariate with toothed leaflets; upper leaves needle-like, divided into 3 almost equal, slender junciform segments, (186-) 239-318 (-346) mm long; petiole and rachis adaxially grooved; lamina totally absent. Inflorescences apical on long shoots, with congested primary and/or secondary racemes; lateral racemes terminate in compound umbels, mostly with numerous condensed, sterile scale-leaves; scale-leaves 2-3 mm long; rays (10-) 13-19 (-22) mm long; involucre bracts 1.5-2.5 mm long; involucel bracts (1.3-) 1.4-1.8 (-2.1) mm long. Flowers with pedicles (2.7-) 3.2-4.3 (-5.2) mm long; calyx teeth (0.3-) 0.4-0.6 mm long; petals very widely ovate, 1.0-1.2 (-1.3) x 0.9 (-1.3) mm, inflexed part (0.5-) 0.6-0.8 (-0.9) mm long; resin ducts branched; filaments (1.0-) 1.1-1.5 (-1.9) mm long, the uppermost 0.1-0.2 mm inflexed in bud; anthers (0.7-) 0.8-0.9 mm long; ovary (0.9-) 1.0-1.3 (-1.4) mm long; stylodium (1.2-) 1.3-1.6 (-1.7) mm wide, (0.5-) 0.6-0.8 (-0.9) mm high; style
(0.1-) 0.2 (-0.3) mm long. Fruit widely obovate; mericarps more or less tuberculare, (2.8-) 2.9-3.7 (-4.0) mm long, (1.0-) 1.2-1.6 (-1.9) mm broad; resin ducts (6-) 8-12.

Notes. *Anginon ternatum* is closely related to *A. difforme*, but can readily be distinguished by the more robust habit and the mature leaves which are much longer, adaxially grooved and invariably divided into three nearly equal slender needle-like segments (Fig. 6). The mature leaves are always without a groove and invariably undivided and junciform in *A. difforme*. This new species is known only from two localities in the northwestern Cape (Gifberg Pass and Heerenlogementsberg; see Fig. 1).

Material examined. 3118 (Vanhynsdorp: Vanhynsdorp (-DA?)), Acocks 14168 (PRE; Gifberg Pass (-DC), Allison 91 (E), 92 (JRAU), 93 (NBG), 128 (PRE), 198 (GRA), Van Wyk 3028 (NBG, PRE); Gifberg, along the escarpment on the west side (-DC), Esterhuysen 22138 (BOL); Heerenlogementsberg (-DC), Hugo 1048 (PRE, STE).

3. *Anginon fruticosum* Allison & Van Wyk, sp. nov.

*Anginon difforme* similis, sed foliis maturis adaxialiter sulcatis (in *A. difforme* teretis) et plurumque in segmenta duo vel plura statuerae inaequalis (in *A. difforme* fere plurumque accicularibus) differt. Species etiam *A. intermedium* similis, sed inflorescentiarum structura, ramis lateralisibus in umbellis compositis terminantibus (in *A. intermedium* in umbellis simplicibus terminantibus) et petalis canalisibus resiniferis ramosis (in *A. intermedium* non ramosis) differt. – Typus: South Africa, Cape Province, Hex River Pass, near top, B-E. van Wyk 3050 (PRE, holo.).


=Rhyticularis swellendamensis* Auct. non Eckl. & Zeyh.: Briq., Bull. Herb. Boiss. 5: 437, Fig. 5 (1897a); Briq. in Bull. Herb. Boiss. 5: 447, Figs 2, 3 B & C (1897b); Wolff, in Engl., das Pflanzenreich IV. 228: 13, Fig. 3 C, E & F (1910).

Much-branched, woody shrub, 1-3 m high; mature parts green, not glaucous. Stems branched at the base, leafy mostly from the base upwards. Leaves relatively uniform; basal leaves binate with toothed leaflets; upper leaves needle-like, undivided and junciform, or with a few short unequal divisions, (16-) 24-86 (-174) mm long; petiole and rachis adaxially grooved; lamina totally absent. Inflorescences apical on long shoots, mostly with congested primary racemes, rarely with secondary racemes, laterale racemes terminate in compound umbels, often with numerous condensed sterile scale-leaves; scale-leaves 4-7 mm long; rays (9-) 11-20 (-27) mm long; involucre bracts (1.8-) 2.2-3.2 (-3.7) mm long; involucel bracts (1.2-) 1.4-1.9 (-2.3) mm long. Flowers with pedicels (1.0-) 1.9-3.8 (-5.8) mm long; calyx teeth 0.3-0.5 (-0.6) mm long; petals very widely ovate, (0.8-) 0.9-1.2 (-1.3) x (0.7-) 0.9-1.1 (-1.2) mm, inffixed part (0.4-) 0.6-0.8 (-0.9) mm long; resin ducts branched; filaments 0.9-1.3 (-1.6) mm long, the uppermost 0.1 (-0.2) mm inffixed in bud; anthers (0.5-) 0.6-0.8 mm long; ovary (0.6-) 0.7-0.9 (-1.1) mm long; stigmodium 1.1-1.5 (-1.7) mm wide, (0.5-) 0.6-8.10 (-1.0) mm high; style 0.1-0.3 mm long. Fruit very widely ovate; mericarps rugose, (2.0-) 2.2-2.9 (-3.5) mm long, (0.6-) 1.1-1.6 (-2.1) mm broad, resin ducts 6. Chromosome number: 2n = 22! (voucher: Van Wyk 3050).

Notes. This species is similar to *Anginon difforme*, but the mature leaves are adaxially grooved and not terete and ungrooved as in *A. difforme*. The mature leaves are usually divided into two or more small segments of unequal size (Fig. 7), while they are almost invariably junciform in *A. difforme*. The habit is distinctly different, with a densely branched appearance. It is also similar to *A. intermedium*, but the lateral racemes terminate in simple umbels and the petals have a single median resin duct. *A. fruticosum* is a common species and is widely distributed at low altitudes in dry flat areas (usually on heavy soils along river beds), from the southern Cape northwards to the Calvina district (Fig. 2). The habitat is very different from that of *A. difforme* and the two species do not co-occur at any of the localities known to us.

Material examined. 3119 (Calvina): 16.5 miles [26.5 km] NW of Calvina (-BC), Acocks 14406 (PRE); slope of Hantam Mountains (-BD), Smith 2470 sheet 1 & 2 (PRE); Hantam Mountains, farm VanRysneskoe (-BD), Batten 1018 sheet 1 & 2 (seedling) (JRAU); Akkerendam Nature Reserve (-BD), Allison 94, 95 (NBG), 96 (PRE), 133 (JRAU); banks of Doorn River, south of Brakriver (-CC), Pearson 3887 (BOL, NH, PRE); S. side of Reuben (-DB), Hanekom 2493 (PRE). -3319 (Worcester): 31.4 km from Ceres to Touwsriver (-BC), Van Wyk 3019 (JRAU); top of Hex River Pass (-BD), Acocks 14109 sheet 1 & 2 (PRE), Allison 85 (JRAU), 86 (NBG), 87, (PRE), 121 (K), Van Wyk 2911 (-E), 3017 (PRE), 3050 (PRE); Hex River Valley, Groote Tafelberg (-BD), Rehmann 2779 (PRE); near Verkeerdewel (-BD), Van Wyk 3018 (JRAU); Farm Doringkloof, S. foothills of Voetpadsberg (-DA), Van der Koo-
Fig. 3. The known geographical distribution of *Anginon tenior*, *A. swellendamense*, *A. paniculatum* and *A. rugosum*.

ij 6 (PRE, STE), C.M. van Wyk 2389, pro parte (STE); -3320 (Montagu): Matjiesfontein (-BA), Compton 6760 (NBG, STE), Thoday & Delf 44 (STE); Witteberg Kloof (-BA), Compton 2765 (BOL); Ladismith, road between Touwsriver and Montagu (-CA), Viviers & Vlok 444 (JRAU); between Pypsteelfontein & Grootsfontein, Waboomsberge (-CA), Moffett & Steensma 4123 (STE); Pypsteelfontein (-CA), Allison 75 (JRAU), 76 (PRE), 77 (NBG); 13 miles [20.9 km] W by S of Barrydale (-DC), Acoks 20336 (PRE); ca. 19 km from Barrydale to Montagu (-DC), Allison 113 (JRAU), 114, 115 (STE); -3321 (Ladismith); Sand River, near N. end of Seven Weeks Poort (-AD), Moffett & Steensma 3925 (STE); at entrance road to Klein Swartberg catchment area (-AD), Allison 202 (JRAU), 203 (PRE), 204 (SAM); Witteberg hills (-CA), Adamson 3677 (BOL); Springfontein between Barrydale and Garcia’s Pass (-CC), Hugo 93 sheets 1-3 (PRE), -3322 (Oudtshoorn): Swartberg (-BD), Vlok 2288 (JRAU); Outeniqua Mountains, near Zebrafontein (-CC), Allison 53 (BOL), 54 (JRAU), 55 (NBG), 56 (PRE), 57 (SAM); Klein Moeras River (-CC), Vlok 1448 (PRE); turn-off to Oudtshoorn on Uniondale road (-CD), Allison 205 (JRAU); Aan- gennaam, De Rust (-DA), Dahlstrand 2397 (PRE, STE); -3323 (Willowmore): 7.5 km NNW of Uniondale (-CA), Van Wyk 3253 sheet 1 & 2 (JRAU). -3419 (Caledon): Genadendal (-BA), Schlechter 10338 (BOL).
4. Anginon pumilum Allison & Van Wyk, sp. nov.

A congeneribus habitu multo minore et minus ligneo (usque ad 0.7 m alto) etiam caulibus horizontalibus subterraneis plantis alis connectis differt. Species Anginon fruticoso similis, sed fructu multo majore et caulibus primarios non ramosis (in A. fruticoso plerumque dense ramosis) differt. — Typus: South Africa, Cape Province, Bredasdorp distr., De Hoop Nature Reserve, southern slope, on limestone, Allison 159 (PRE, holo.; K, NBG, iso.).

Slender, unbranched, woody shrublet, up to 0.7 m high, mature parts (leaves, stems or at least the inflorescences) usually distinctly glaucous. Stems unbranched, leafless at the base, often connected to each other by a horizontal subterranean rhizome. Leaves relatively uniform; basal leaves trinerved with toothed leaflets; upper leaves slender, invariably divided, 2-pinnate, (38-) 61-99 (-115) mm long; petiole and rachis adaxially grooved; lamina inconspicuous, the segments slender. Inflorescences terminal, sparse, mainly with primary racemes; lateral racemes terminate in compound umbels; scale-leaves 5-10 mm long; rays (18-) 21-32 (-38) mm long; involucral bracts (1.8-) 1.9-2.2 (-2.3) mm long, involucral bracts (1.3-) 1.5-2.0 (-2.1) mm long. Flowers with pedicels (1.8-) 2.3-4.4 (-6.1) mm long; calyx teeth (0.3-) 0.4-0.6 (-0.7) mm long; petals very widely ovate, (0.9-) 1.0-1.2 (-1.3) × 1.0-1.1 (-1.2) mm, inflexed part 0.6-0.8 (-0.9) mm long; resin ducts branched; filaments (1.0-) 1.1-1.5 (-1.9) mm long, the uppermost 0.1-0.2 mm inflexed in bud; anthers 0.7 (-0.8) mm long; ovary (1.0-) 1.1-1.3 (-1.4) mm long; stylopodium (1.1-) 1.2-1.5 (-1.6) mm wide, (0.5-) 0.6-0.8 (-0.9) mm high; style 0.2 (-0.3) mm long. Fruit widely depressed ovate; mericarps more or less rugose, (1.9-) 2.0-2.5 (-2.8) mm long, (1.2-) 1.3-1.5 (-1.6) mm broad, resin ducts 6.

Notes. This species (Fig. 8) differs from all other species in the much smaller and less woody habit (up to 0.7 m high), as well as the presence of horizontal subterranean rhizomes between the subsrhubs. Anginon pumilum is somewhat similar to A. fruticosum, but differs in the dwarf habit, larger fruit and the much smaller and unbranched primary stems. It is known only from limestone areas in the De Hoop region near Bredasdorp (Fig. 2).

Material examined. 3420 (Bredasdorp): Goereeso (-AA), Acoks 22673 (PRE); De Hoop road, 2 km from turn-off to Ouplaas (-AD), Allison 153 (GRA), 154 (JRAU), 155 (PRE), road to De Hoop, c. 1 km from main road (-AD), Allison 157 (NBG); De Hoop Nature Reserve, near entrance gate (-AD), Allison 158 (BOL), 159 (K, NBG, PRE); 2.5 miles [4 km] SW of Wydgelegen Post Office (-AD), Acocks 23003 (PRE); De Hoop Provincial Farm (-AD), Lewis 5145 (NBG); Windhoek Provincial Nature Reserve (-AD), Van der Merwe 843 (PRE); Oudtshoorn (-AD), C.M. van Wyk 2254 (STE); De Hoop, Poetberg, ca. 1 km from Elandspad homestead (-BC), Morley 132 (STE); Dist. Bredasdorp (-AD), Van der Merwe “1915 or 1904” (STE).

5. Anginon tenuior Allison & Van Wyk, sp. nov.

Anginon swellendamensis affinis, sed habitu minore sparsiore, petiolis persistentibus, foliis brevioribus segmentis brevibus rhachidis apicem restrictis et in petalis canalisus inflexinis ramosis (in A. swellendamensis habitu majore et multo robustiore, petiolis non persistentibus, foliis dividitis aut si divisus nunc segmentis longis non rhachidis apicem restrictis et in petalis canalisus inflexinis non ramosis) differt. — Typus: South Africa, Cape Province, Montagu district, Oudeberg Pass, Van Wyk 3334 (PRE, holo.; K, iso.).

Slender, sparsely branched, woody shrub, up to 1.5 m high; mature parts usually distinctly glaucous. Stems branched at the base, slender and leafless except for the upper parts; petioles persistent below the leafy parts. Leaves relatively uniform; basal leaves trinerved with toothed leaflets, upper leaves needle-like, but never jun-ciform, usually with three very short divisions near the apex only, (33-) 46-73 (-85) mm long; petiole and rachis adaxially grooved; lamina inconspicuous, the segments slender. Inflorescences apical on long shoots, very sparse, with primary and secondary racemes, lateral racemes terminate in compound umbels; scale-leaves 4-8 mm long; rays (20-) 24-30 (-33) mm long; involucral bracts 2.0-4.0 mm long; involucral bracts ± 1.5 mm long. Flowers with pedicels (3.1-) 3.4-4.7 (-5.4) mm long; calyx teeth ± 0.2 mm long; petals widely ovate, ± 0.8 × ± 0.9 mm, inflexed part ± 0.4 mm long; resin ducts branched; filaments ± 1 mm long, the uppermost ± 0.1 mm inflexed in bud; anthers ± 0.8 mm long; ovary ± 0.6 mm long; stylopodium ± 0.9 mm wide, ± 0.5 mm high; style ± 0.3 mm long. Fruit widely depressed ovate; mericarps more or less rugose, (2.4-) 2.6-3.2 (-3.7) mm long, (1.4-) 1.6-1.9 (-2.1) mm broad; resin ducts 6.

Notes. This species is similar to Anginon swellendamense, but differs in the smaller, sparser habit, the persistent petioles, the shorter leaves with short segments which are restricted to the apex of the rachis (Fig. 9) and also in the branched resin ducts of the petals. A. swellendamense has a larger, more robust habit, non-persistent petioles, longer undivided or divided leaves.
with long segments which are not restricted to the apex of the rachis and unbranched resin ducts in the petals. This species is known only from the Montagu area (Fig. 3) and the habitat seems similar to that of A. swellendamense.

Material examined. 3320 (Montagu): Baden near Montagu (-CA), Levyns 8009 (BOL), Lewis 1793 (NBG); near top of Oudeberg Pass (-CA), Van Wyk 3333 (E, JRAU), 3334 (K, PRE), 3335 (NBG), 3336 (PRE), Viviers & Vlok 449 (JRAU).

6. Anginon swellendamense (Eckl. & Zeyh.) B. L. Burtt


Note. Since the most complete collection of Ecklon & Zeyher is housed in S, we choose this specimen as lectotype,

≡ Trinia swellendamensis Eckl. & Zeyh., Enum.: 340 (1837). – Type as above.

≡ Rhyticarpus swellendamensis (Eckl. & Zeyh.) Briq., in Bull. Herb. Boiss. 5: 451 (1897), pro parte; Wolff in
Engl., das Pflanzenreich IV, 228: 177 (1910), pro parte.

= Rhytichopus ecklonis Sond. in Fl. Cap. 2: 540 (1862), nom. illegit. = Type as for *Trinia swellendamensis*.

= [Busulurum acerosum E. Mey. in Drège, Zwei Pflanzengeog. Doc. 115: 170 (1843), nom. nud.]

Robust, sparsely branched, woody shrub, 1-2 m high, mature parts invariably glaucous, with a conspicuous white wax layer. Stems usually single at the base and branched higher up, mostly leafy from the base upwards. Leaves relatively uniform; basal leaves trinerved with toothed leaflets, upper leaves often divided and 2- to 3-pinnate, sometimes junciform, (42-) 91-187 (-301) mm long; petiole and rachis adaxially without a groove; lamina absent. Inflorescences apical on long shoots, exceptionally sparse and lax, with primary and secondary racemes; lateral racemes terminate in compound umbels; scale-leaves 2-5 mm long; rays (10-) 16-31 (-50) mm long; involucre bracts (2.0-) 2.4-3.7 (-4.3) mm long; involucel bracts (1.5-) 1.6-2.3 (-2.9) mm long. Flowers with pedicels (1.8-) 2.1-3.9 (-6.7) mm long; calyx teeth 0-3.0-4 (-0.5) mm long; petals very widely ovate, (0.6-) 0.8-1.0 (-1.1) × (0.6-) 0.7-0.8 (-0.9) mm, inffixed part (0.4-) 0.5-0.6 (-0.7) mm long; resin ducts unbranched; filaments (0.7-) 0.9-1.3 (-1.5) mm long, the uppermost 0.1-0.3 mm inffixed in bud; anthers 0.6-0.7 (-0.8) mm long; ovary (0.5-) 0.6-0.8 (-0.9) mm long; stylodium (0.8-) 1.0-1.3 mm wide, (0.3-) 0.5-0.7 (-0.8) mm high; style (0.2-) 0.3 (-0.4) mm long. Fruit widely ovate; mericarps more or less rugose, (2.3-) 2.8-3.5 (-4.2) mm long, (1.1-) 1.2-1.5 (-1.8) mm broad, resin ducts 6. Chromosome number: 2n = 22! (voucher: Van Wyk 3013).

Notes. *Anginon swellendamense* is easily recognized by the thick, robust, primary stem which is unbranched at the base but branched higher up, and the thick, divided or junciform leaves, densely arranged from the base of the plant upwards. The mature parts (stems, leaves and inflorescences) are invariably glaucous. *A. swellendamense* is similar to *A. tenitor* (q.v.) but is widely distributed, from Worcester in the west to Uniondale in the east (Fig. 3). It appears to be endemic to the Little Karoo, where it often co-occurs with *A. fruticosum* on heavy soils in dry habitats.

Material examined. 3319 (Worcester): S. foothills of Voetpadseberg (-DA), C.M. van Wyk 2389, pro parte (STE); top of Hex River Valley (-DC), Allison 88-90 (JRAU), Van Wyk 2910 (JRAU); Hex River (-BD), Boul 1079 (BOL), 5165 sheet 1 & 2 (PRE); Worcester (-CB), Allison 119 (JRAU); Karoo Gardens, Worcester (-CB), Allison 82-84 (PRE), Bruyns s.n. sub. NBG 108626 (BNG), Compton 17936 (NBG), 20366 (BOL, NBG, STE), Leighton 1605 sheet 1 & 2 (BOL), Van Wyk 3013 (JRAU); ca. 50 km from Worcester to De Doorns (-DA), Allison 120 (JRAU); near De Wet (-DA), Esterhuysen 19672 (BOL, NBG, PRE); Burger Pass (-DB), Allison 199 (JRAU); Coo Mountain (-DB), Compton 10270 (NBG), -3320 (Montagu): between Kochhamskloof and Gauritzriver (-CC), Ecklon & Zeyher 2194 (S, SAM); Barrydale (-DC), Allison 72-74 (NBG), Hafström & Acocks 1027 (PRE); ca. 31 km W of Barrydale (-DC), Allison 116-118 (PRE); -3321 (Ladismith): between Anysberg and Ladismith (-AC), Van Wyk 3187 (JRAU); Nokloof Nature Reserve (-CA), Laidler 110 (STE); top of Rooiberg Pass (-DA), Allison 109 (JRAU), Van Wyk 2804 sheet 1-3 (JRAU), -3322 (Oudtshoorn): along Oudtshoorn turn-off from George (-CB), Allison 61, 62 (BOL), 63, 64 (GRA), 65-68, 206

Fig. 5. The neotype of *Anginon difforme*, showing the junciform mature leaves and characteristic fruit.
Robust, sparsely branched, woody shrub, up to 4 m high, mature parts invariably glaucous, with a conspicuous white wax layer. Stems usually branched at the base, mostly leafy from the middle of the plant upwards. Leaves relatively uniform; basal leaves trinerved with toothed leaflets; upper leaves invariably divided, 4- to 5-pinnate, never junciform, (120-) 159-236 (-287) mm long; petiole and rachis adaxially grooved; lamina virtually absent. Inflorescences apical on long shoots, exceptionally sparse and lax, with primary, secondary and tertiary racemes; lateral racemes terminate in compound umbels; scale-leaves 3-10 mm long; rays (7-) 11-22 (-32) mm long; involucral bracts (1.6-) 1.8-3.0 (-3.4) mm long; involucral bractlets (1.2-) 1.4-1.8 (-2.1) mm long. Flowers with pedicels (1.7-) 2.1-3.0 (-3.5) mm long; calyx teeth 0.3-0.4 (-0.5) mm long; petals widely ovate, (0.8-) 0.9-1.0 (-1.1) × 0.7-0.8 (-0.9) mm, inrolled part (0.3-) 0.4-0.5 mm long; resin ducts unbranched; filaments (0.8-) 0.9-1.2 (-1.3) mm long, the uppermost 0.1-0.2 mm inrolled in bud; anthers (0.6-) 0.7 (-0.9) mm long; ovary (0.6-) 0.7-0.8 (-0.9) mm long; stylodium (0.9-) 1.0-1.3 (-1.4) mm wide, (0.4-) 0.5-0.6 (-0.7) mm high; style (0.1-) 0.2 (-0.3) mm long. Fruit ovate; mericarps more or less rugose; (4.0-) 4.7-5.7 (-6.3) mm long, (1.0-) 1.3-1.7 (-1.9) mm broad; resin ducts 6.

Notes. This species is similar to Anginon swellendamense, but differs in the much larger habit (up to 4 m high), the leafless stem bases and the 4- to 5-pinnate leaves, of which the petiole and rachises are adaxially grooved. A. paniculatum is geographically isolated from A. swellendamense and occurs in the western Cape, from Citrusdal northwards to Clanwilliam, the Nardouw Mountain and the Matsikamma Mountain at Vanrhynsdorp (Fig. 3).

Material examined. 3118 (Vanrhynsdorp): Between Baievel and Pendoeringkraal (-DB), Allison 195 (BOL), 196 (JRAU), 197 (PRE); Gilberg (-DD), Drège s.n. b (S), Marloth 3018, pro parte (PRE); Matsikamma Mountain, 1 km on road to Sewefontein (-DD), Van

7. Anginon paniculatum (Thunb.) B. L. Burtt


Note. There is only one specimen available for lectotypification in Thunberg’s herbarium and we assume that this is the original specimen.

≡ Sium paniculatum Thunb., Prodr.: 50 (1794) & Fl.
Wyk 3337a-c (JRAU); Nardouw Mountain, between Vöndeling and Brakvlei (DD), Van Wyk 3344 (JRAU); -3218 (Clanwilliam); above Clanwilliam Dam (BB), Taylor 11271 sheets 1-4 (PRE); 38.6 km S of Clanwilliam (BD), Allison 122 (JRAU) 123 (PRE); National road between Citrusdal and Clanwilliam (BD), Van Wyk 3025 (JRAU), 3026 (NBG), 3027 (PRE); Olifantssrivier [probably near Citrusdal] (BD), Drège s.n. a (S); -3219 (Wupperthal); 8 km N of Citrusdal (-CA), Van Wyk 2902 (E). Without precise locality: “e Cap. b. spei”, Thunberg s.n. sub UPS 7054 (UPS).

8. Anginon rugosum (Thunb.) Raf.


Note. The only available specimen in the Thunberg herbarium is an obvious choice of lectotype, despite the locality details on the reverse of the sheet (cited above) which do not match the original citation (“Hantam Mountains”). The rugose fruit agrees with the diagnosis and the plant almost certainly came from the eastern Cape. A similar inaccuracy was found in the type locality of Lotonis decumbens Thunb., an eastern Cape endemic species said to be from the “Roggeveld” (Van Wyk 1991). This suggests that some of Thunberg’s eastern Cape specimens were inadvertently confused or mixed with his north-western Cape collections.


≡ Rhyticularis rugosus (Thunb.) Sond. in Fl. Cap. 2: 540 (1862), pro parte; Wolff in Engl., d.Respenreich IV, 228: 177 (1910), pro parte. – Type as above.

≡ Anginon uitenhagense (Eckl. & Zeyh.) B.L. Burtt in Edinb. J. Bot. 48: 2; 176 (1991), synon. nov. – Type: South Africa, Cape Province, Uitenhage, Zwartkopsrivier, Ecklon & Zeyher 2193 (S!, lecto., designated here; SAM!, 3x, isoleceto.).

≡ Trinia uitenhagensis Eckl. & Zeyh., Enum.: 340 (1837). – Type as above.

≡ Rhyticularis paniculatus sensu Koso-Poljansky in J. Bot. Russe 1913: 7 (1913), quoad desc. et tab. 4. excl. basion.

≡ [Lepisma paniculata E. Mey. in Drège, Zwei Pflanzengeog. Doc.: 131, 133, 198 (1843) nom. nud., pro parte].

Slender, sparsely branched, woody shrub, up to 1.5 m high, mature parts invariably glaucous, with a conspicuous white wax layer. Stems branched at the base, mostly leafy from the middle of the plant upwards. Leaves relatively uniform but very variable on each leaf cluster; basal leaves triternate with flat toothed leaflets; upper leaves much reduced, invariably divided, 3-pinnate, the segments slender but never junciform, (42-) 77-162 (-202) mm long; petiole and rachis adaxially grooved; lamina virtually absent. Inflorescences apical on long shoots, sparse, with primary and secondary racemes; lateral racemes terminate in compound umbels; scale-leaves 4-8 mm long; rays (12-) 19-33 (-44) mm long; involucral bracts (1.4-) 1.9-3.2 (-3.9) mm long; involucel bracts (1.2-) 1.4-2.1 (-2.4) mm long. Flowers with pedicels (2.2-) 3.0-5.2 (-7.3) mm long; calyx teeth (0.3-) 0.4-0.5 (-0.6) mm long; petals very widely ovate, (0.8-) 0.9-1.0 (-1.1) × (0.9-) 1.0-1.1 mm, inflexed part 0.4-0.6
Material examined. 3324 (Steytlerville): Kouga Mountains, on plateau just north-west of Geelhoutboskloof (CA), Viok 2630 (JRAU); Kuga (DB), Drège s.n. d (S); 3325 (Port Elizabeth): Addo Park, on Zuukop (BD), Liebenberg 7725 sheet 1 & 2 (PRE); Zwartkopspivier, (CD), Ecklon & Zeyher 2193 sheets 1-3 (S, SAM), Zeyher 335 (SAM); Redhouse (DC), Paterson 456 sheet 1 (BOL), sheets 2 & 3 (GRA). -3326 (Grahamstown): 2.4 km from Reed Valley to Paterson (AC), Allison 208 (BOL), 209 (GRA), 210 (JRAU), 211 (NBG), 212 (PRE), 213 (E), Archibald 3955 (PRE); Grahamstown (BC), MacOwan 1614 (BOL, GRA). Without precise locality: Thunberg s.n. (S), s.n. sub UPS 6875 (UPS).


Type: Namibia, Builspiel, Bez. Rehoboth, Grenzkopf, Strey 2154 (M!, lecto., designated here; K!, PRE! 3x, isolecto.).


Note: We lectotypify this species merely because the specimen in M was not explicitly designated as the holotype.

Sparsely branched shrub, woody at least at the base, up to 1.2 m high, mature parts green, not glaucous. Stems branched at the base, sparsely leafy. Leaves relatively uniform; basal leaves biterminate with toothed leaflets; upper leaves invariably laminate, much divided, never needle-like or junciform, (65-) 87-124 (-135) mm long; petiole and rachis adaxially grooved; lamina invariably present, finely divided into small segments. Inflorescences apical on long shoots, sparse, with primary and secondary racemes; lateral racemes terminate in compound umbels, very rarely with some simple umbels; scale-leaves 2-3 mm long; rays (16-) 18-40 (-45) mm long; involucro bracts 0.8-1.5 mm long; involucel bracts 0.7-1.0 mm long. Flowers with pedicels 4.0-5.0 (-6.0) mm long; calyx teeth 0.4-0.6 mm long; petals widely ovate, 0.6-0.8 × 0.5-0.7 mm, inflexed part 0.3-0.4 mm long; resin ducts unbranched; filaments ± 0.8 mm long, the uppermost 0.1-0.2 mm inflexed in bud; anthers (0.4-) 0.5-0.6 (-0.7) mm long; ovary (0.3-) 0.4-0.6 mm long; stylopodium 0.7-0.8 (-1.0) mm wide, 0.3-0.4 (-0.6) mm high; style (0.1-) 0.2-0.4 mm long. Fruit widely depressed ovate; mericarps more or less smooth, ± 2 mm long, ± 1.5 mm broad; resin ducts 6.

Notes. Anginon streyi is closely related to A. verticillatum, but can be distinguished by the lateral racemes which predominantly terminate in compound umbels and only rarely in simple umbels as in the latter. The
fruit of *A. streyi* seem smaller and broader than those of *A. verticillatum* (as far as it is possible to judge from the limited material), but the habit and leaves are closely similar. *A. streyi* was obviously misplaced in Sonderina, as is evident from the fruit anatomy and the woody, perennial habit. The only known localities are in the Rehoboth region in Namibia (Fig. 4).

**Material examined.** 2416 (Maltahoehe): Farm Buellsport, district Rehoboth (-AB), Strey 2154 (K, M, PRE 3x); Farm Tsais-Maltahoehe (-AB), Müller & Tilson 884 (M, PRE); ravine below Naukluft Plateau (-AB), Müller 884 (WIND).

10. **Anginon verticillatum** (Sond.) B. L. Burtt


≡ *Annesorhiza verticillata* (Sond.) Hiroe, Umbell. World: 677 (1979). – Type as above.

≡ [Lepisma verticillatum] E. Mey. in Drège, Zwei Pflanzengeog. Doc.: 198 (1843), quoad spec a & b, nomen nudum (See Drège 1843, p. 93)]

Much-branched, woody shrub, up to 2 m high, mature parts green, not glaucous. Stems branched at the base and higher up, mostly leafy from the base upwards. Leaves relatively uniform; basal leaves binate with toothed leaflets; upper leaves invariably laminate, much divided, never needle-like or junciform, (24-) 31-51(-65) mm long; petiole and rachis adaxially grooved; lamina invariably present, finely divided into small segments; occasionally with short, broad, papillate hairs along the margins and veins. Inflorescences mostly apical on long shoots, rarely on short shoots, somewhat sparse, mainly with primary racemes; lateral racemes terminate in simple umbels; scale-leaves 4-10 mm long; rays (33-) 45-73 (-82) mm long; involucral bracts ±4 mm long; involucre bracts (1.6-) 1.7-2.6 (-2.8) mm long. Flowers with pedicels (4.4-) 5.9-9.0 (-10.7) mm long; calyx teeth (0.3-) 0.4-0.6 mm long; petals widely ovate, (0.9-) 1.1-1.3 (-1.4) × (0.7-) 0.8-1.0 (-1.1) mm, inflexed part (0.6-) 0.7-0.9 (-1.0) mm long; resin ducts unbranched; filaments (0.8-) 0.9-1.3 (-1.8) mm long, the uppermost 0.1-0.2 mm infolded in bud; anthers 0.8-0.9 (-1.0) mm long; ovary (0.9-) 1.0-1.3 (-1.4) mm long; stylododium (1.0-) 1.2-1.5 (-1.6) mm wide, (0.5-) 0.6-0.8 mm high; style (0.3-) 0.4-0.5 mm long. Fruit widely ovate; mericarps somewhat rugose, (3.0-) 3.8-4.8 (-5.3) mm long, (1.4-) 1.6-2.0 (-2.3) mm broad; resin ducts 6, rarely 8.

**Notes.** *Anginon verticillatum* is closely related to *A. streyi* but the lateral racemes invariably terminate in simple umbels and the fruit are much larger. It is also similar to *A. intermedium*, but in this species the mature (upper) leaves are partially or totally junciform and not laminate as in *A. verticillatum*. The known geographical distribution covers a wide area in the dry north-western Cape, from the Sutherland region northwards to the Richtersveld (Fig. 4). All the known localities are at relatively high altitudes.

**Material examined.** 2816 (Oranjemund): Obib Mountain Peak (-BA), A.E. van Wyk 9021 (PRU); top of Nu-
11. Anginon intermedium Allison & Van Wyk, sp. nov.

*Anginon fruticoso* similis, sed inflorescentiae structura, rami lateralis in umbellis singularibus terminantibus (in *A. fruticoso* in umbellis compositis terminantibus) et petalis canalibus resinisferis non ramosis (in *A. fruticoso* ramosis) differt. Species etiam *A. verticillato* similis, sed foliis maturis acicularibus (in *A. verticillato* plerumque laminatus) differt. Typos: South Africa, Cape Province, Vioolsdrif distr., summit of the Ploeberg complex, Viviers 2112 (PRE, holo.; NBG, iso.).

Much-branched, woody shrub, 1.0-2.5 m high; mature parts green, not glaucous. Stems branched at the base, mostly leafy from the base upwards. Leaves variable: basal leaves binate with toothed leaflets; upper leaves laminate or needle-like, often finely and unequally divided, sometimes junciform, (37-) 49-96 (-144) mm long; petiole and rachis adaxially grooved; lamina present on some leaves, absent on others. Inflorescences apical on long shoots, somewhat sparse, with primary and secondary racemes; lateral racemes terminate in simple umbels; scale-leaves not seen; rays (25-) 32-59 (-70) long; involucre bracts (1.8-) 1.9-2.3 (-2.6) mm long; involucel bracts (1.1-) 1.2-1.7 (-1.8) mm long. Flowers with pedicels (3.3-) 3.8-6.1 (-7.4) mm long; calyx teeth 0.3 (-0.4) mm long; petals widely ovate, 0.9-1.1 (-1.3) × (0.8-) 0.9-1.0 mm, inflexed part 0.6-0.8 (-0.9) mm long; resin ducts unbranched; filaments (1.0-) 1.1-1.2 (-1.3) mm long, the uppermost 0.1 (-0.2) mm in flexed in bud; anthers 0.7 (-0.8) mm long; ovary (1.1-) 1.2-1.5 (-1.6) mm long; stylodium (1.0-) 1.1-1.4 mm wide, 0.4-0.6 (-0.7) mm high; style 0.2-0.4 mm long. Fruit unkonwn.

Notes. This species is similar to *Anginon fruticosum* but differs in the lateral racemes which terminate in simple umbels (compound in *A. fruticosum*) and also in the unbranched resin ducts of the petals (branched in *A. fruticosum*). The leaves (Fig. 10) are longer than in *A. fruticosum* and vary from totally laminate (lower parts of the stem), to laminate only at the apex (middle of the stem), to junciform and without any lamina (upper part of the stem), directly below the inflorescence. This species is also similar to *A. verticillatum*, but differs in the junciform or nearly junciform mature leaves (invariably laminate in the latter). *A. intermedium* co-occurs with *A. verticillatum* and *A. diferse* at several localities in Namaqualand (Fig. 2) but we have not found any evidence of hybridization or introgression.

Material examined. 2817 (Vioolsdrif): Summit of the Ploeberg complex (-CA), Viviers 2112 (NBG, PRE). - 2917 (Springbok): Top of Nababiessberg (-DB), Alli-
son 188 (JRAU). -3018 (Kamiesberg): Kamiesberg Pass (-AC), Allison 190 (JRAU), 194 (PRE). -3119 (Calvinia): Hantam Mountain, kloof north of Calvinia (-BD), Marloth 10278 (STE).

12. Anginon jaarsveldii B. L. Burtt

In Edim. J. Bot. 48:2: 256 (1991) [see also pp. 173-175]. - Type: NW Cape, 2919AA, Groot Pellaereb, south slope just below krantz, dry rocky area with xerophytic plants, 1.2 m high, 10 viii 1982. Van Jaarsveld & Paterson 6723 (E, holotype, NBG, isotype).

Note. We have not seen the type specimens, but studied the only known population in situ (Ernst van Jaarsveld kindly accompanied us on a field trip in 1991).

Much-branched, rounded, woody shrub, 1-2 m high; mature parts yellowish green, not glaucous. Stems repeatedly branched from the base upwards, more or less leafy from the base upwards. Leaves relatively uniform; basal leaves alternate with entire leaflets; upper leaves 3-5-nerved, invariably divided, never needle-like or juncoform, (23-)28-50 (-72) mm long; petiole and rachis adaxially grooved, lamina invariably present, slender, narrowly oblong. Inflorescences mostly apical on long shoots, rarely on short shoots, relatively short and somewhat congested, invariably with only primary divisions; lateral racemes terminate in simple umbels; scale-leaves 2-4 mm long; rays (11-)19-34 (-48) mm long; involucral bracts (1.9-)2.1-2.9 (-3.1) mm long; involucral bracts (1.0-)1.1-1.3 (-1.4) mm long. Flowers with pedicels (2.4-)3.1-5.1 (-7.3) mm long; calyx teeth 0.4 (-0.5) mm long; petals widely ovate, 0.9-1.1 (-1.2) x (0.6-)0.7-0.8 (-0.9) mm, inflexed part (0.4-)0.5-0.6 (-0.7) mm long; resin ducts unbranched; filaments (0.8-)1.0-1.3 (-1.5) mm long, the uppermost 0.1-0.2 mm inflexed in bud; anthers (0.7-)0.8 (-0.9) mm long; ovary (0.7-)0.8-1.0 mm long; stylopodium 0.8-1.1 (-1.2) mm wide, (0.4-)0.5-0.6 (-0.7) mm high; style 0.2-0.4 mm long. Fruit depressed ovate; mericarps usually not wrinkled, with small translucent dots (substomatal cavities) on a smooth surface, (1.6-)1.8-2.3 (-3.0) mm long, (1.2-)1.3-1.6 (-2) mm broad, resin ducts 6, rarely 8.

Notes. Anginon jaarsveldii is a distinctive species, easily recognised by the densely branched and rounded habit and the slender, pinnate leaves. It is known only from Pella Mountain in the northern Cape Province (Fig. 4).

Material examined. 2919 (Pofadder): Upper south-western slopes of Pella Mountain (-AA), Allison 162 (BOL), 163, 164 (E), 165, 166 (JRAU), 167 (K), 168 (NBG), 169 (PRE).

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References


Review


This is the long awaited, first part of the revision of all American bipinnate Ingeae (Leguminosae-Mimosoideae) dealing with the genera Hydrochorea, Balizia, Abarema, Hesperalbizia, Pseudosamanea, Samanea, Blanchetiodendron, Leucocloron, Chloroleucum, Sphinga, Havardia, Ebenopsis, Painteria, Macrosamanea, Albizia, Enterolobium, Cedrelinga, Falcatoria, Paraserianthes, Lysiloma. In the second, forthcoming part the genera Calliandra, Cojoba, Pithecellobium, and Zygia will appear.

Since the revision of the Ingeae by G. Bentham (1875) nobody has dared to dig into this extremely speciose group of American Mimosoideae until recently when Barneby & Grimes dealing with the bipinnate Ingeae and T. D. Pennington (The genus Inga, Botany, The Royal Botanic Gardens, Kew 1997. ISBN 1 900347 12 1. 844 pages) with the about 250 spp. of the genus Inga made two major contributions to our knowledge of New World Ingeae.

The present volume contains chapters on the: “Anatomy and morphology of the Pithecellobium complex”, “Characters, Phylogenetic Analysis, and Classification of Ingeae”, “Key to the genera of Ingeae native, naturalised, and planted in the Americas”, and lists the above mentioned genera in four groups: The Abarema, the Samanea, the Chloroleucum, and the Pithecellobium-alliances. Chapters on the Literature Cited, Numerical List of Taxa, List of Numbered Exsiccateae, and Index to Scientific Names concludes the volume.

The keys to both genera and species are pragmatic and clear. The descriptions are long and meticulous. Under each species notes are given on the autecology, the distribution, salient characters, and taxonomic history. The illustrations are few, but excellent. The distribution maps are clear, but suffer from the uneven quality of the base maps.

As pointed out by the authors future work on e.g. the molecular taxonomy, the cytology, the seedlings, and the wood anatomy shall reveal if this new classification can stand the test of time. The African-Madagascaran species of the group also need to be taken into consideration.

The authors and the publisher are to be congratulated on this book, which deserve a place on the book shelves of botanical libraries, in herbaria, and which moreover can be used in advanced teaching in taxonomy and phylogeny.

Ivan Nielsen