



Taxonomic notes on *Acanthopsis* (Acanthaceae, tribe Acantheae): the group with semi-dense spikes and 5-fid bracts

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Abstract

Acanthopsis is a poorly understood genus taxonomically, confined to arid parts of southern Africa. The density of the inflorescences and the morphology of the bracts are taxonomically useful characters for species delimitation. This contribution focuses on the taxonomy and conservation status of those members in the genus characterized by semi-dense inflorescences with 5-fid bracts, all of which are confined to arid parts of the Northern Cape Province, South Africa. Six species, *A. carduiifolia*, *A. glabra*, *A. glandulopalmata*, *A. insueta*, *A. nitida* and *A. scullyi*, are recognized in this group. Three new species, *A. glandulopalmata*, *A. insueta* and *A. nitida*, are described. An identification key to the species of the group with semi-dense spikes and 5-fid bracts is provided.

Key words: *Acanthodium*, *Acanthus*, *Blepharis*, conservation status, nomenclature, South Africa, taxonomic revision

Introduction

Acanthopsis Harvey (1842: 28) is a morphologically distinct but taxonomically poorly understood genus confined to South Africa and Namibia (Steyn & Van Wyk 2015). It can easily be distinguished from the closely related *Blepharis* Jussieu (1789: 103) by the unlobed style (*not* bilobed) and the stamen filaments without an appendage (with a forward-directed appendage on the posterior pair of stamen filaments) (Vollesen 2000). Although superficially rather similar-looking, members of *Acanthopsis* display intricate patterns of variation and the infrageneric classification of the group is problematic. The most recent complete genus account and only available identification key to members of *Acanthopsis* has been the now largely outdated taxonomic treatment by Clarke (1901), who recognized seven species. The present contribution emanates from an on-going taxonomic revision of the group by one of us (HMS) initiated in 2011. In our opinion the number of species in the genus is at least 20, some of which also have infraspecific taxa.

Over the years various characters were used to distinguish among the members of *Acanthopsis*, e.g. habit (Clarke 1901, Steyn & Van Wyk 2016), bract morphology (Nees von Esenbeck 1847, Clarke 1901, Steyn & Van Wyk 2015, 2016) and indumentum of the leaves and floral bracts (Meyer 1961, Steyn & Van Wyk 2015, 2016, 2017). Up to now inflorescence density was mentioned as part of the genus description, e.g. “flowers in dense basal spikes” (translated from Meyer 1961: 21) including *Acanthopsis disperma* Nees von Esenbeck (1847: 278) and *Acanthopsis hoffmannseggiana* (Nees von Esenbeck 1847: 277) Clarke (1901: 35). Some individual species descriptions also mention the density of the inflorescence e.g. “spike...very dense” (Nees von Esenbeck 1847: 277) regarding *Acanthodium hoffmannseggianum* Nees von Esenbeck (1847: 277) (= *Acanthopsis hoffmannseggiana*) and “bracts...somewhat distant” (Nees von Esenbeck 1847: 277) regarding *Acanthodium glaucum* Nees von Esenbeck (1847: 277) (= *Acanthopsis glauca* (Nees) Schinz (1890: 201)).

The density of the inflorescences was found to be a taxonomically important character by Steyn & Van Wyk (2015) to distinguish two artificial groups, namely a “Dense spike” and “Open-spike group” (Steyn & Van Wyk 2015: 7). Since 2015, the definitions of a dense vs. open (now called “semi-dense”) spike have been refined, and an amended key to the groups within *Acanthopsis* is provided (see “Taxonomic treatment” below). In the present contribution we resolve the taxonomy of those members of *Acanthopsis* belonging to the group with semi-dense spikes and 5-fid bracts (five primary spines). As part of this study, a historical review of the group is presented, species concepts are clarified, an identification key is supplied and three new species from the Northern Cape, South Africa are described. In addition, the updated conservation status for the relevant taxa is given.

Materials and methods

Fieldwork was carried out over three growing seasons to assess the variation of live plants in nature, and to collect spirit material, herbarium specimens and photographic images. Relevant herbarium specimens kept at BOL, J, K, KMG, NBG, NMB, P, PRE and SAM (in NBG) together with high resolution images of herbarium specimens from JSTOR (2017) and from the herbaria of BM, LINN, S, SBT, UPS and Z were studied; acronyms of herbaria follow Holmgren *et al.* (1990). For the demarcation of infrageneric taxa, a classical comparative morphological approach was followed. All measurements were taken from herbarium specimens, or in the case of floral parts, mostly from additional pressed material collected by one of us (HMS). Terminology follows Beentje (2016). Descriptors used to indicate abundance and frequency follow Schmid (1982).

In the sections “Additional specimens examined”, locality citations were reproduced as per the specimen labels. The specimens are arranged according to the Degree Reference System proposed by Edwards & Leistner (1971); the quarter degree grid reference is supplied between brackets after each locality cited. All specimen localities were also georeferenced as accurately as possible and these values were used for mapping and conservation assessments. Conservation assessments follow the standard procedure based on IUCN guidelines (IUCN 2012) and Raimondo *et al.* (2009). All cited specimens have been seen by the first author.

Information on habitat and ecology is provided for each taxon. References to bioregions and biomes follow Mucina & Rutherford (2006), but the biome concepts of Rutherford & Westfall (1994) and Low & Rebelo (1996) are also mentioned. Vegetation types are based on the vegetation map of Mucina & Rutherford (2006). The names and demarcation of local centres of floristic endemism follow Van Wyk & Smith (2001).

Results

Acanthopsis species can generally not be reliably identified using a single character and nearly always a combination of several characters is required and fertile mature plants are usually essential for positive identification. In *Acanthopsis* the morphology of the inflorescences and bracts are taxonomically useful at species level. Two main types of inflorescences can be distinguished based on the density of individual flowers. *Dense spikes* are defined as those inflorescences where the inflorescence axis among bracts is never exposed, with successive bract laminas vertically markedly overlapping (>60% of length) during flowering and fruiting. *Semi-dense spikes* include two subgroups, a) spikes where the inflorescence axis is rarely exposed and successive floral bract laminas are partially overlapping (30–60% of length), and b) lax spikes where the inflorescence axis is nearly always exposed (especially during flowering) with successive bract laminas only slightly overlapping (<30% of length) (Fig. 2). Density of the inflorescence is best determined from mature flowering or fruiting inflorescences.

For the description of the bracts we follow the same terminology as in Steyn & Van Wyk (2015, 2016, 2017). Except were stated otherwise, the middle to upper bracts within an inflorescence were used in the key and descriptions.

Taxonomic treatment

Updated key to major artificial species groups in *Acanthopsis*:

1. Virgate shrublets up to 25–40(–60) cm tall, with well-developed branches and clearly visible internodes, the latter usually >10 mm long; leaves scattered (well-spaced) along woody stem.....
..... **Shrublet group** (see Steyn & Van Wyk 2016) (also see *A. dregeana* subsp *longispina* in Steyn & Van Wyk 2017)
- Plants acaulescent (rosulate), or compact subshrubs (<25 cm tall), with gnarled stems and reduced (usually not visible) internodes, the latter usually <5(–8) mm long; leaves tufted or in basal rosette2
2. Mature inflorescence a dense spike with inflorescence axis among bracts never showing; flowers not clearly decussate; successive bract laminas overlapping (>60% of length), hardly exposing bract lamina (also see Fig. 2).....
..... **Dense spike group** (see Steyn & Van Wyk 2015)
- Mature inflorescence a semi-dense spike with inflorescence axis among bracts occasionally to rarely showing; flowers often clearly decussate; successive bract laminas overlapping (0–60% of length), clearly exposing bract lamina (also see Fig. 2).....3
3. Middle to upper floral bracts ending in 3 ovate, mucronate to spinose lobes or 3 primary spines with central spine markedly longer than lateral spines
..... **Semi-dense spike group with trifid bracts** (see Steyn & Van Wyk 2017)
- Middle to upper floral bracts ending in 5(–7) primary spines or if 3 primary spines then of equal length
..... **Semi-dense spike group with 5-fid bracts** (present contribution; see key to the species below)

TABLE 1. Diagnostic characters to distinguish among *Acanthopsis* species of the group with semi-dense spikes and 5-fid bracts. Descriptors used to indicate frequency follow Schmid (1982).

Characters	<i>A. glabra</i>	<i>A. scullyi</i>	<i>A. nitida</i>	<i>A. glandulopalmaria</i>	<i>A. insuenta</i>	<i>A. carduiifolia</i>
Distribution	Namaqualand, Northern Cape (50-)70-140(-250), (5-)7-9 usually	Namaqualand, Northern Cape 80-120(-150), 8-10(-12) usually	Steinkopf area, Northern Cape 45-55, (8-)10-13 never	Richtersveld, Northern Cape 45-50(-70), 8-10(-12) never	Richtersveld, Northern Cape 35-45, 8-10(-12) never	Hantam, Northern Cape (25-)40-60(-90), 6-9(-10) rarely
Inflorescence length and diam. (mm)						
Axis between bracts exposed when in flower	hirsute	villose	glabrous to puberulent	hirsute	pubescent to hirsute	hirsute to pubescent
Bract indumentum (abaxial surface)	usually	rarely	often	nearly always	usually	usually
Central primary spine simple	occasionally	very rarely	usually	usually	very often	nearly always
Bracts: spines longer than lamina						
Corolla length × width (mm)	27-29 × 9(-10),	(21-)25-31 × (8-)9-11	25-27 × 10-12	28-32 × 10-11	25 × 10	20-25(-27) × 8-10(-12)
Corolla tube length (mm)	10	8-10	8(-9)	9-10	9	5-8(-10)
Corolla throat (colour)	cream	cream	lemon-yellow	lemon-yellow	lemon-yellow	white or cream

Key to the species of *Acanthopsis* in the semi-dense spike group with 5-fid bracts:

1. Leaves strigose to villose; inflorescences usually >70 mm long; floral bracts lax (overlap <30%) (Fig. 2); inflorescence axis often exposed; bract spines often shorter than bract lamina.....2
- Leaves puberulent, strigose or with appressed hairs; inflorescences usually <70 mm long; floral bracts semi-dense (overlap 30–60%) (Fig. 2); inflorescence axis rarely exposed; bract spines usually as long as or longer than bract lamina3
2. Leaves strigose; floral bracts usually with simple central primary spine, spines usually ensiform; bracts hirsute with deflexed to appressed short hairs (Kamiesberg area, Northern & Western Cape)1. *A. glabra*
- Leaves villose; floral bracts nearly always with compound central primary spine, spines usually triangular; bracts pubescent or villose with antrorse silky hairs (Steinkopf to Kamiesberg, Northern Cape).....2. *A. scullyi*
3. Leaves puberulent, glossy; bracts puberulent to glabrous; calyx glabrous (Anenous Pass area, Northern Cape).....3. *A. nitida*
- Leaves with indumentum of appressed, strigose or spreading hairs; bracts hirsute (often pubescent to villose); calyx hirsute to pubescent.....4
4. Bracts with relatively long (up to 0.25 mm), spreading glandular hairs; primary spines winged (lanceolate), nearly always simple; corolla relatively large (28–32 mm long), tube 9–10 mm long, (Richtersveld, Northern Cape)4. *A. glandulopalmeta*
- Bracts with short (usually <0.16 mm), deflexed to spreading eglandular hairs (rarely pubescent to villose); primary spines narrow (ensiform) to narrowly winged, central primary spine often simple, lateral ones usually with basal secondary spine on the side facing the central primary spine; corolla smaller (20–25 mm long), tube 5–9 mm long5
5. Plants grey due to appressed, densely packed short hairs on leaves; middle to upper bracts ending in (3–)5 primary spines, upper bracts very often 3-fid; secondary spines often longer than primary spines; corolla throat lemon-yellow (Richtersveld, Northern Cape).....5. *A. insueta*
- Plants pubescent with strigose short, white hairs on leaves; middle to upper bracts ending in 5 primary spines; secondary spines (if present) always shorter than primary spines; corolla throat cream or white (Hantam, Northern Cape).....6. *A. carduiifolia*

All the species of *Acanthopsis* recognized here have the following character states in common (also see Fig. 3): semi-dense inflorescences; each flower supported by a single bract; bracteoles two, linear-lanceolate with a bony midrib ending in a spinous tip; calyx 4-partite with the basal parts and veins thickened and bony; dorsal sepal longer and wider than the ventral one with both much wider than the lateral sepals, the dorsal sepal enveloping the other three; ventral sepal 2-fid, ending in spinous tips; lateral sepals lanceolate, broader at the base; corolla tubular at the base, 1-lipped, 5-lobed with the outer lobes reduced, pubescent on outside (abaxially), with barb-shaped hairs on inside (adaxially) of lobes; stamens 4, anthers densely bearded; filaments hard and bony; style filiform with the stigma a single flattened lobe; capsules ovate, flattened, glabrous, 2-seeded; seeds ovate to orbicular, covered with long, white hygroscopic hairs.

1. *Acanthopsis glabra* (Nees) H.M.Steyn, *comb. nov.* (Figs. 1, 3A, & 4)

Basionym:—*Acanthodium glabrum* Nees von Esenbeck (1847: 278). *Blepharis carduiifolia* (Linnaeus 1782: 294) Anderson (1864: 35) var. *glabra* (Nees) Anderson (1864: 35). *Acanthopsis carduiifolia* (L.f.) Schinz (1890: 200) var. *glabra* (Nees) Schinz (1890: 200). “*Acanthus glaber*” Meyer in Drège (1843: 67, 161), *nom. nud.* (Art. 38).

Type:—SOUTH AFRICA. Northern Cape: Little Namaqualand, Kamies Bergen. [Am Berg bei Kasparskloof, fide Drège (1843)] 3000–4000 ft [915–1220 m], [19 August 1830], *Drège s.n.* (lectotype K000394342! designated here).

Perennial, acaulescent herb or compact subshrub, up to 25 cm tall with very short internodes. Leaves sessile, petiole-like base with spines 1–3 mm long; lamina oblanceolate, 45–70(–100) × (6–)8–10(–12) mm, often grey to grey-green due to densely packed long, strigose hairs, also with subsessile glands; apex acute, base attenuate, margin undulate, coarsely dentate-spinose, spines fine to rigid, 1–3(–6) mm long, yellow to orange-brown. Inflorescences lax (bract lamina overlap <30%), cylindrical, subsessile with a few infertile bracts at the base, (50–)70–140(–250) mm long, (5–)7–9 mm in diameter. Bracts oblong to obovate, 18–20(–23) mm long (including spines), lamina 9–11(–14) mm long, base obtuse; hirsute with deflexed to appressed short hairs, also with isolated, subsessile glandular hairs abaxially, silky-hairy adaxially; middle and upper bracts usually truncate, ending in 5 primary spines; central primary spine usually simple, rarely with 1 pair of short marginal secondary spines; lateral primary spines usually simple; spines spreading (usually 90°) in fruit. Bracteoles linear, (6–)8–9 mm long, pubescent with short, deflexed to spreading hairs and short glandular hairs. Calyx with dorsal sepal ovate, apiculate to acuminate, 13–14 mm long, hirsute to pubescent with short, deflexed to spreading hairs and short glandular hairs abaxially, silky-hairy adaxially, 7–9-veined; ventral sepal ovate, 11–13 mm long, hirsute to pubescent with short, deflexed to spreading hairs and short glandular hairs abaxially, silky-hairy adaxially, 5–7-veined; lateral sepals 7–9 mm long, pubescent with short hairs, also with long, silky hairs along margin. Flowers clearly decussate; corolla cream or lilac with darker veins, cream throat, 27–29 × 9(–10) mm, tube 10 mm long, pubescent especially on outside, central lobe wider than long or equal, constricted at the base, truncate to emarginate. Filaments 7–8 mm long, glandular; anthers orange-brown, 2–3 mm long. Style with basal part densely covered with glandular hairs. Capsules 7 × 3(–4) mm. Seeds 4 × 3 mm.

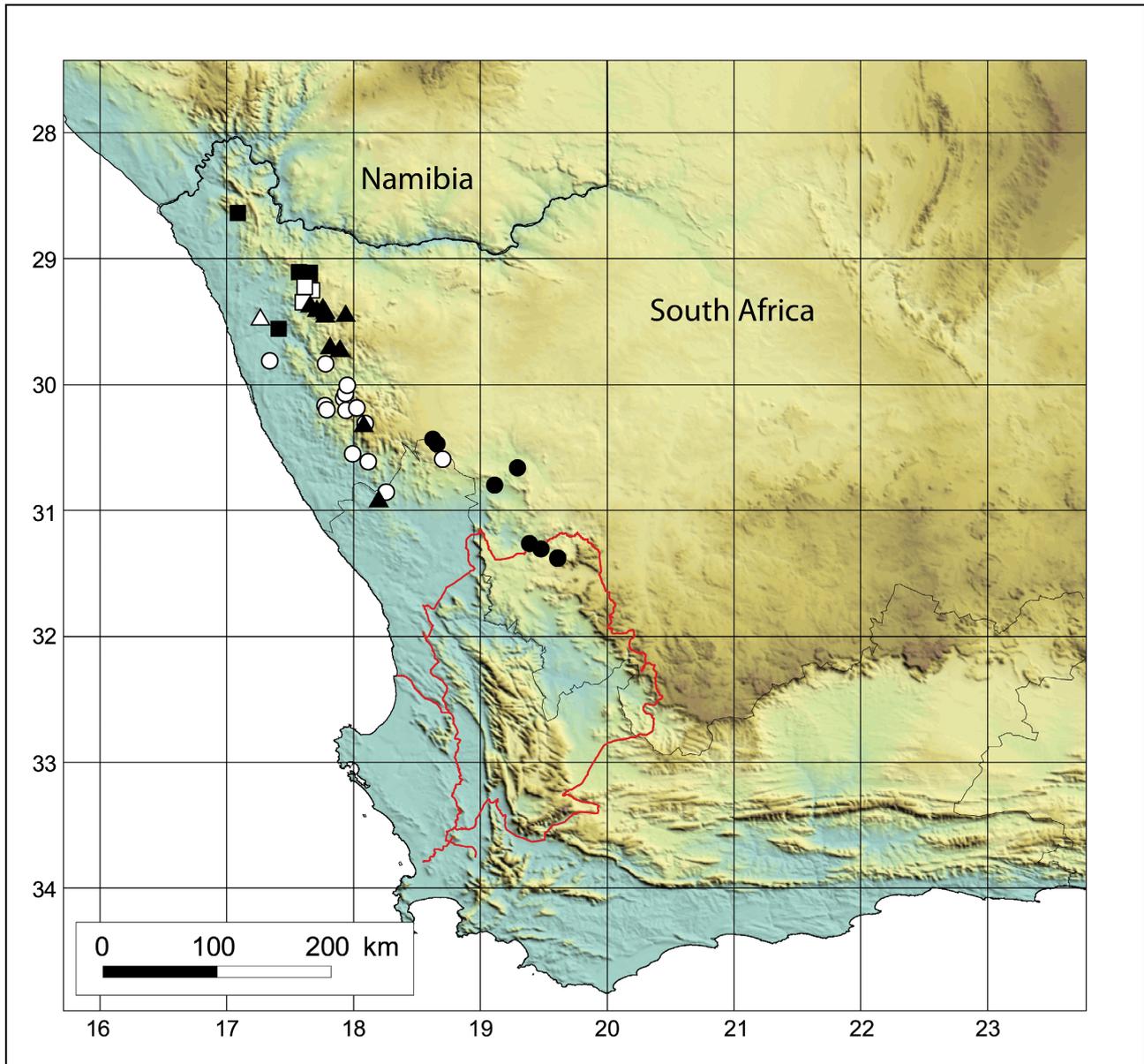


FIGURE 1. Known distribution of *A. glabra* (○), *A. scullyi* (▲), *A. nitida* (□), *A. glandulopalmata* (■), *A. insueta* (△) and *A. carduiifolia* (●). Thunberg's route (1774) indicated in red. (for explanation see Notes under taxonomic treatment of *A. carduiifolia*)

Etymology:—The specific epithet *glabra*, meaning “smooth/without hairs”, probably refers to the floral bracts which appear glabrous to the naked eye.

Distribution, ecology and phenology:—*Acanthopsis glabra* is known from mountain slopes and rocky outcrops on the escarpment from west of Spektakel Pass in the north to just north of Bitterfontein in the south (Northern Cape) (Fig. 1) at elevations between 260 and 1500 m. This range falls within the Namaqualand Hardeveld Bioregion (Mucina & Rutherford 2006) in the Succulent Karoo Biome (Rutherford & Westfall 1994, Low & Rebelo 1996, Mucina & Rutherford 2006) with the Kamiesberg localities falling in the Namaqualand Cape Shrubland Bioregion (Mucina & Rutherford 2006) in the Fynbos Biome (Low & Rebelo 1996, Mucina & Rutherford 2006). It receives predominantly winter rains with an average of 200–250 mm per year. This species prefers deep sandy soils derived from granitic gneisses. Specimens with flowers were collected at the end of August to December.

Conservation status:—This species is widespread and common. Subpopulations are large, and it persists even in heavily overgrazed communal rangelands in the Kamiesberg. As there are no severe threats to this species, the population is not suspected to be declining and it is categorised as Least Concern according to the IUCN Red List Category and Criteria (IUCN 2012) (L. von Staden, pers. comm.).

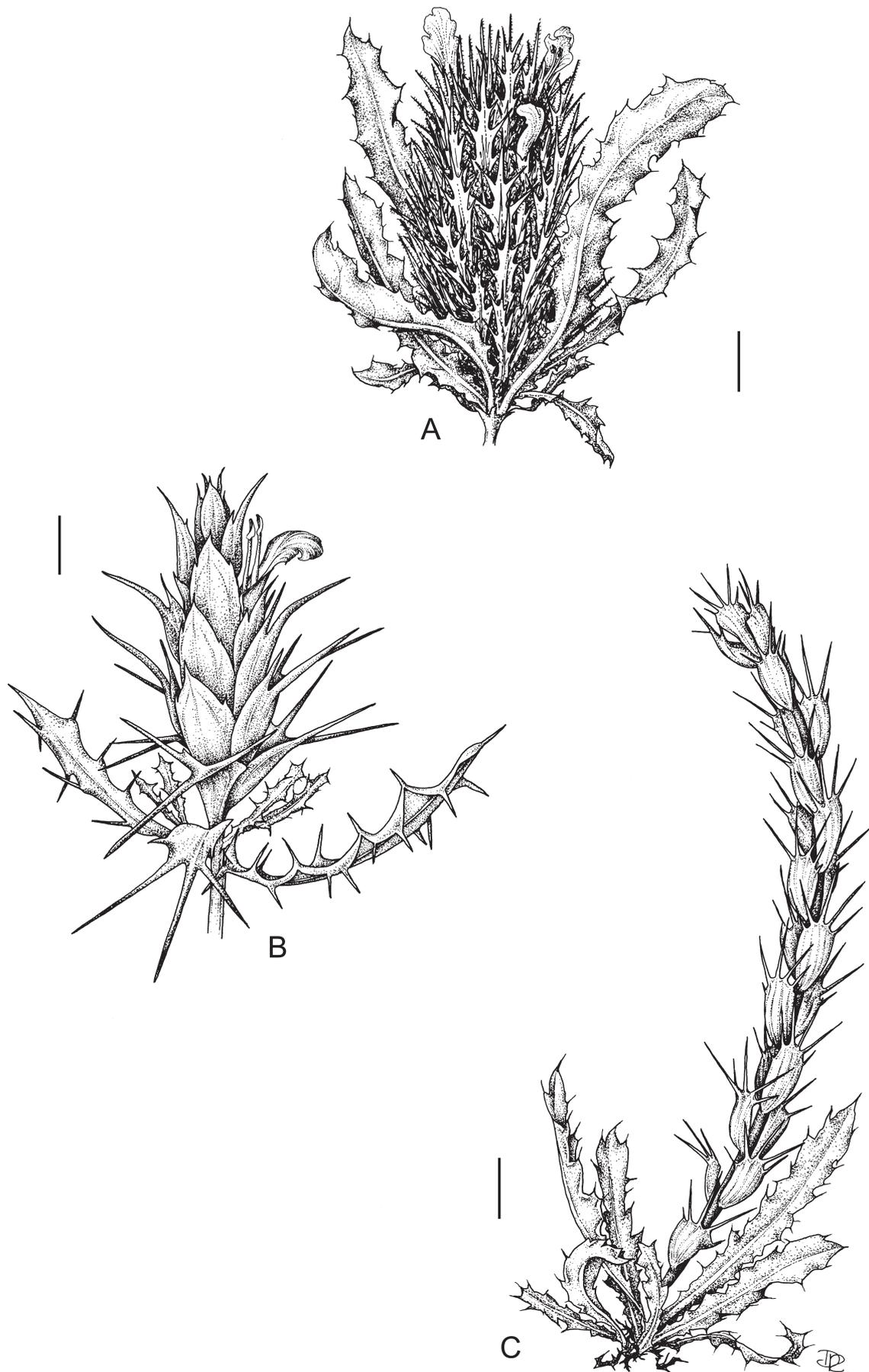


FIGURE 2. Types of inflorescences found in *Acanthopsis* based on density of individual flowers and their bracts. A. dense (>60% bract lamina overlap), B. semi-dense (30–60% bract lamina overlap), C. semi-dense (<30% bract lamina overlap). Scale bar = 10 mm. Artist: Daleen Roodt.

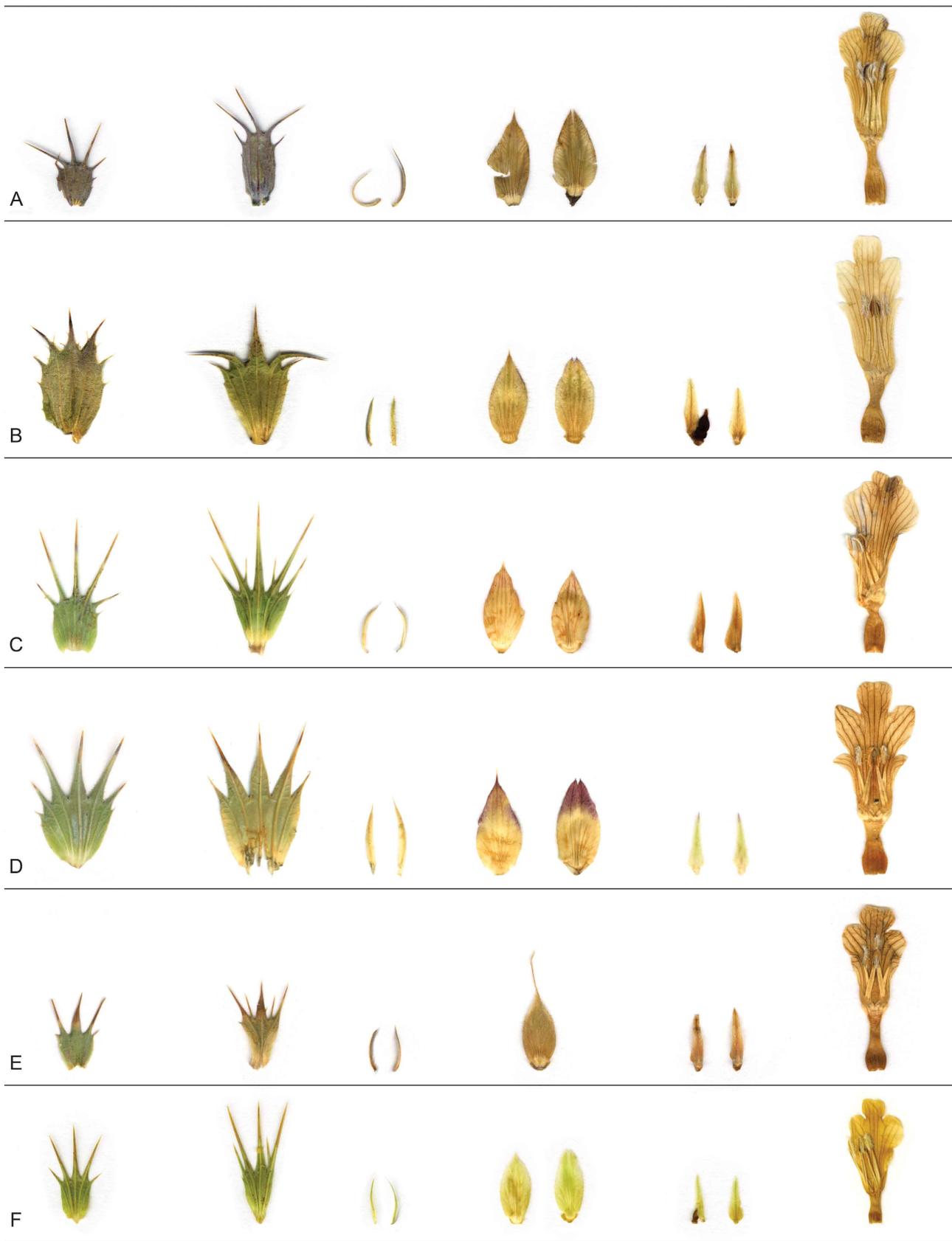


FIGURE 3. Comparison of floral parts, associated bracts and bracteoles (from left to right): bracts (2), bracteoles (2), calyx (4 sepals: dorsal, ventral and 2 lateral ones) and corolla with anthers. A. *A. glabra*, B. *A. scullyi*, C. *A. nitida*, D. *A. glandulopalmata*, E. *A. insueta*, F. *A. carduiifolia*. Note: the bract on the left is from lower down in the same inflorescence. Scale bar = 10 mm. Vouchers: A = Steyn 1893 (PRE), B = Steyn 1911 (PRE), C = Steyn 1884 (PRE), D = Steyn 1890 (PRE), E = Steyn 1805 (PRE), F = Koekemoer 4620 (PRE).

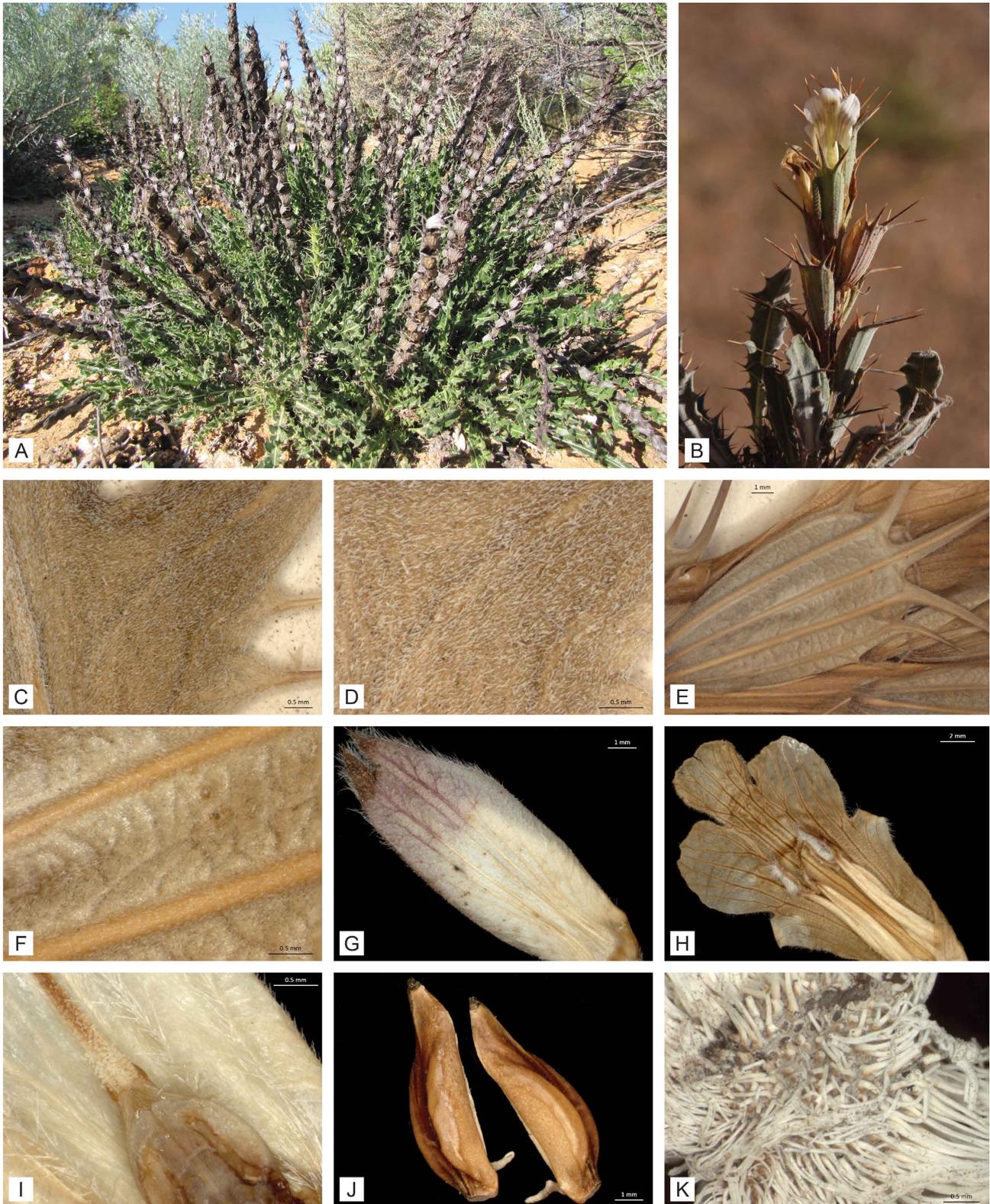


FIGURE 4. *Acanthopsis glabra*. A & B. Habit. C & D. Leaf indumentum (abaxial). E & F. Bract. G. Calyx. H. Corolla (lobes lilac to cream; throat cream). I. Glandular hairs at base of style. J. Capsule. K. Seed. Vouchers: C–F = *Acocks 16476* (PRE), G–I = *Steyn 1893* (PRE), J & K = *Steyn 2119* (PRE). Photographed by: H.M. Steyn (A, C–K) and M. Koekemoer (B).

Additional specimens examined:—SOUTH AFRICA. Northern Cape: Namaqualand. Farm Kourootjie 316, 260 m, (2917CD), 9 October 1986, *Le Roux & Lloyd 608* (NBG); Namaqualand District, on Springbok-Soebatsfontein road, Messelpadpas, 851 m, (2917DD), 12 August 2009, *Steyn 1565* (PRE); Namaqualand District, Groot Vlei, (2918DA), 3 September 1951, *Johnson 204* (NBG); Namaqualand; Kamieskroon; 7 miles [11 km] N. by W. of Kamieskroon, 2500 ft [760 m], (3017BB), 25 September 1952, *Acocks 16476* (PRE); Namaqualand; Kamieskroon, (3017BB), 15 December

1936, *Adamson 1422* (PRE); Namaqua National Park. On the cement road between Skilpad and Soebatsfontein, 689 m, (3017BB), 29 December 2010, *Koekemoer 3996* (PRE); Namaqualand District. Namaqua National Park, 100 m S of view point on circular route, 691 m, (3017BB), 11 August 2011, *Steyn 1860* (PRE); Namaqualand District. No Heep road N of Kamieskroon, 765 m, (3017BB), 2 September 2010, *Steyn 1767* (PRE); Kamieskroon. Bloupoort, 750 m, (3017BB), 10 September 2001, *Venter JV9599(JV-52)* (KMG, PRE); Namaqualand. In valley 2 miles [3.2 km] west of Garies, (3017DD), 7 December 1910, *Pillans 5640* (BOL); Namaqualand District. N of Leliefontein, 1043 m, (3018AA), 4 October 2015, *Steyn 2119* (PRE); Khamiesberg. Sandy ground at foot of Beacon hill 2 miles [3.2 km] south east of Leliefontein Mission Station, 5000 ft [1500 m], (3018AC), 17 January 1911, *Pearson 6378* (BOL); Garies; on track between Buffelsfontein and Doornkraal, 491 m, (3018CA), 22 August 2009, *Steyn 1681B* (PRE). Western Cape: Namaqualand District. Farm Eenkokerboom/Kwanous, 320 m, (3018CD), 27 August 2012, *Steyn 1893* (PRE); Bushmanland and Upper. Near Nieuwfontein, (3018DA), 21 December 1908, *Pearson 3317* (BOL). Without precise locality: *Drège 2436* (P), *s.n.* (S).

Notes:—*Koekemoer 3996* has villose leaves and antrorse hairs on the bracts but is here included in *A. glabra* rather than in *A. scullyi* due to the oblong, truncate bracts ending in five simple primary spines.

“*Acanthus glaber*” was proposed by Meyer in Drège (1843) based on a herbarium specimen in Drège’s herbarium, but it was not validly published because no diagnosis or description was provided. Nees von Esenbeck (1847) firstly validly published the name *Acanthodium glabrum* for the taxon with citing *Acanthus glaber* as a synonym. Schinz (1890) treated it as a variety of *Acanthopsis carduiifolia* (L.f.) Schinz (1890: 200) and the authorship of the variety name was incorrectly attributed to “(E.Mey.) Schinz”. The correct author citation of the variety *Acanthopsis carduiifolia* var. *glabra* is therefore (Nees) Schinz. Simultaneously, Schinz published an additional variety, *A. carduiifolia* var. *longearistata* Schinz (1890: 200) based on a specimen (*Schenck 318*) collected at “Aus in Gross-Namaland” [Namibia]. This specimen (*Schenck 318*) could not be traced and verified and therefore this name is excluded from the current treatment. In his treatment of the genus for Flora Capensis, Clarke (1901) upheld var. *glabra* but did not mention var. *longearistata*. Meyer (1961) sunk *A. carduiifolia* var. *longearistata* under *A. disperma*.

Although Anderson (1864), Schinz (1890) and Clarke (1901) treated *Acanthopsis glabra* as a variety of *Acanthopsis carduiifolia*, Drège (1843) and Nees von Esenbeck (1847) recognised it at species level in *Acanthus* and *Acanthodium* respectively. Until more information becomes available, we have decided to follow Drège and Nees in recognizing *A. glabra* as a distinct species as the latter is probably more closely related to *A. scullyi* (S.Moore) Obermeyer (1937: 138) than to *A. carduiifolia*.

2. *Acanthopsis scullyi* (S.Moore) Obermeyer (1937: 138); Snijman (2013: 163) (Figs. 1, 3B & 5)

Basionym:—*Blepharis scullyi* Moore (1901: 301). “*Acanthus carduiifolius* Thunb. *á spica glabriuscula*”, ms. [name written on sheet], *sensu Drège 2431*.

Type:—SOUTH AFRICA. Northern Cape: Namaqualand [no precise locality], *Scullyi 249* (holotype BM000931147!; isotypes BOL138596!, K000394339!, PRE0129526-0!).

Perennial, acaulescent herb or compact subshrub, 10–15 cm tall with very short internodes. Leaves sessile, petiole-like base with spines 1–2 mm long; lamina oblanceolate, 55–105 × 10–15(–18) mm, pubescent to villose with long, silky hairs, occasionally interspersed with long glandular hairs; apex acute, base attenuate, margin undulate, coarsely dentate-spinose, spines fine to rigid, 1–3 mm long, yellowish. Inflorescences usually lax (bract lamina overlap <30%), cylindrical, subsessile with a number of infertile bracts at the base; 80–120(–150) mm long, 8–10(–12) mm in diameter. Bracts obovate to broadly obovate, (16–)18–22 mm long (including spines), lamina 10–12(–14) mm long, base obtuse; villose with antrorse (often spreading) long, silky hairs interspersed with short hairs and occasionally also with glandular hairs; middle and upper bracts ending in 5 primary spines, 3 central primary spines usually broadly triangular; central primary spine nearly always compound with 1 or 2 pairs of short, marginal secondary spines (prickles); lateral primary spines usually with 1 short marginal secondary spine on side facing central primary spine, occasionally also with 1 short, marginal secondary spine on opposite side; primary spines spreading in flower and fruit. Bracteoles linear, 6–8(–9) mm long, silky-hairy, also with long, glandular hairs. Calyx with dorsal sepal lanceolate to ovate, acuminate, 12–14 mm long, silky-hairy, often also with long, glandular hairs, 5–7-veined; ventral sepal lanceolate to narrowly ovate, 11–13 mm long, silky-hairy, 5(–7)-veined; lateral sepals 8–10 mm long, densely silky-hairy especially at base. Flowers clearly decussate; corolla cream to light mauve with lilac veins, cream throat, (21–)25–31 × (8–)9–11 mm, tube 8–10 mm long, pubescent, central lobe often square (as wide as long), not or only slightly constricted at the base, truncate to emarginate. Filaments 7–8(–10) mm long, glandular; anthers beige, 3 mm long. Style with patch of glandular hairs at the base. Capsules 8–9 × 4 mm. Seeds 4 × 2 mm.

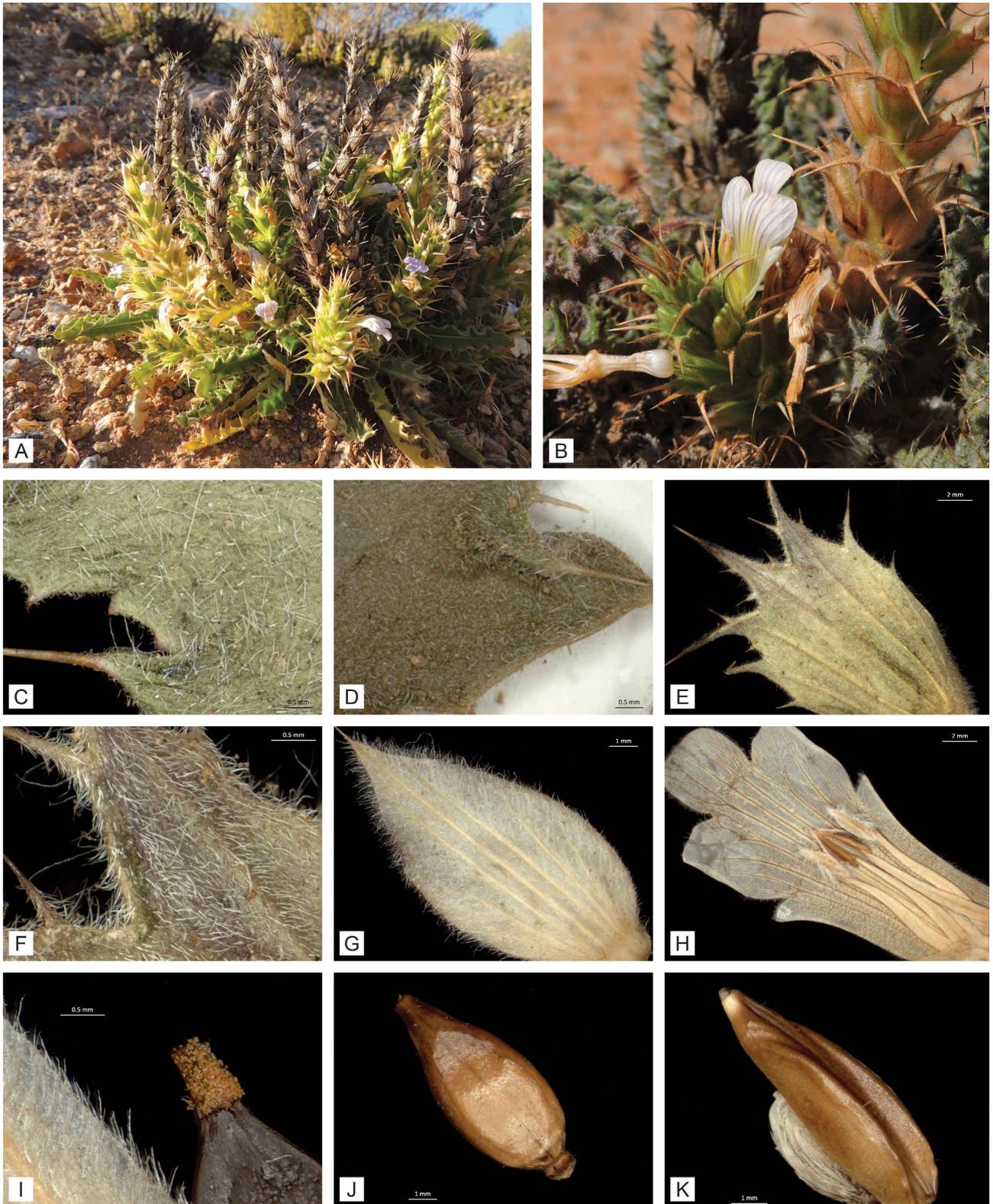


FIGURE 5. *Acanthopsis scullyi*. A & B. Habit. C & D. Leaf indumentum (abaxial). E & F. Bract. G. Calyx. H. Corolla (lobes cream to pale purple; throat cream). I. Glandular hairs at base of style. J. Capsule. K. Capsule with seed. Vouchers: C = Steyn 2134 (PRE), D–K = Steyn 1911 (PRE). Photographed by: H.M. Steyn (A, C–K) and M. Koekemoer (B).

Etymology:—The specific epithet commemorates William Charles Scully [1855–1943], a magistrate, author and collector of natural history specimens, who collected the type material somewhere in Namaqualand.

Distribution, ecology and phenology:—Known from a number of localities between Steinkopf in the north and the farm Eenkoker (Bitterfontein area) in the south (Fig. 1). *Acanthopsis scullyi* is mainly found in sandy soil derived from granitic gneisses on hill slopes and sandy plains (elevation between 700–1400 m) in a region receiving an average

of 160–370 mm of rain per year. The known distribution falls within the Namaqualand Hardeveld Bioregion (Mucina & Rutherford 2006) in the Succulent Karoo Biome (Rutherford & Westfall 1994, Low & Rebelo 1996, Mucina & Rutherford 2006), with the Kamiesberg locality falling in the Namaqualand Cape Shrubland Bioregion (Mucina & Rutherford 2006) in the Fynbos Biome (Low & Rebelo 1996, Mucina & Rutherford 2006). Specimens with flowers were collected between August and September.

Conservation status:—*Acanthopsis scullyi* is known from many herbarium records and is locally common. There are at least 10 known subpopulations, and it is likely that many more exist as suitable habitat is widespread across its range. Subpopulations are large and appear to be resilient to disturbance, and therefore the population is not suspected to be declining. Although it is range-restricted (EOO 1272 km²), it is not threatened and is categorised as Least Concern according to the IUCN Red List Category and Criteria (IUCN 2012) (L. von Staden, pers. comm.).

Additional specimens examined:—SOUTH AFRICA. Northern Cape: Namaqualand Klipkoppe. Hills around Josfontein, (2917BC), 21 August 1985, *Le Roux 3256* (NBG); Namaqualand District. On dirt road between Perdewater and Eyams, NNW of Springbok (river crossing), 694 m, (2917BC), 10 October 2015, *Steyn 2134* (PRE); Namaqualand District. On dirt road between Steinkopf and Concordia, 1061 m, (2917BD), 9 October 2015, *Steyn 2130* (PRE); Namaqualand District. On dirt road between Bulletrap and Gladkop, NNW of Springbok, 800 m, (2917BD), 10 October 2015, *Steyn 2131* (PRE); Namaqualand District. On dirt road between Bulletrap and Gladkop, NNW of Springbok, 856 m, (2917BD), 10 October 2015, *Steyn 2132* (PRE); Namaqualand District. On dirt road between Bulletrap and Perdewater, NNW of Springbok, 835 m, (2917BD), 10 October 2015, *Steyn 2133* (PRE); Springbok, Motel 5 km downhill of town, 800 m, (2917DB), 13 July 1988, *Dean 547* (J); Namaqualand District. Kokerboom Motel, S of Springbok, 812 m, (2917DB), 9 August 2013, *Steyn 1911* (PRE); Namaqualand District. SE of Kokerboom Motel, 813 m, (2917DB), 8 October 2015, *Steyn 2124* (PRE); Namaqualand District. On road between Springbok and Spektakel Pass, 813 m, (2917DB), 11 October 2015, *Steyn 2139* (PRE); Leliefontein, pass W of settlement. 30°18'44.9"S, 18°04'42.5"E, 1420 m, (3018AC), 22 September 2001, *Mucina & Santos 7257/22* (NBG). Western Cape: Eenkokerboom, 900 ft [275 m], (3018CC), 3 September 1897, *Schlechter 11061* (NMB, PRE, Z). Without precise locality: [Illegible] zw [zwischen] Ezelsfontein u [und] Roodeberg, 3500–4000 ft [1060–1220 m], 12 November 1830, *Drège 2431*, s.n. (P).

Notes:—The type specimen of *A. scullyi* is very distinct and has lax inflorescences with bracts ending in short, broadly triangular primary spines with a compound central primary spine (usually two pairs of short prickles on margin), and villose leaf and bract indumentum. However, in recent collections of the species it is clear that these characters are variable as specimens occasionally have simple or compound central primary spines (*Steyn 2139*) or the spines could vary between shortly triangular to almost needle-shaped. However, compound, broadly triangular spines is the norm.

Mucina & Santos 7257/22 and *Drège 2431* are included in *A. scullyi* as they have the typical bract shape (obovate) and the latter also has antrorse, villose hairs on the bracts, but both specimens have leaves with a strigose indumentum and a distinct petiole-like base (as in *A. glabra*).

3. *Acanthopsis nitida* H.M.Steyn, sp. nov. (Figs. 1, 3C & 6)

Type:—SOUTH AFRICA. Northern Cape: Namaqualand District. Anenus Pass, S of road, 709 m, (2917BA), 9 October 2015, *Steyn 2129*, (holotype PRE0866187!, isotype NBG!).

Diagnosis:—*Acanthopsis nitida* differs from all other members of the group with semi-dense spikes and 5-fid bracts in its glossy appearance (not matt), yellow-green puberulent to sub-glabrous leaves (not grey or green strigose to villose leaves) and in having a glabrous (not variously hairy) calyx.

Perennial, compact subshrub, 7–10 cm tall with very short internodes. *Leaves* sessile, base petiole-like with spines 3–7 mm long; lamina oblanceolate, 40–60(–90) × 8–12 mm, often with yellow-green appearance, puberulent with strigose to spreading short hairs, also with subsessile glandular hairs; apex acute, base attenuate, margin undulate, dentate-spinose, spines rigid, 3–5(–8) mm long, yellow to brown. Inflorescences semi-dense, cylindrical, subsessile, 45–55 mm long, (8–)10–13 mm in diameter. Bracts broadly obovate to wedge-shaped, (15–)20–30 mm long (including spines), lamina 8–11 mm long, base obtuse to attenuate; lamina and spines glabrous to puberulent with short white, spreading, hairs and isolated subsessile glandular hairs abaxially, silky-hairy adaxially; middle and upper bracts ending in 5(–7) primary spines; central primary spine often compound with one pair of marginal secondary spines, often simple; lateral primary spines very often with 1 long basal secondary spine (shorter than primary spine) on side facing central primary spine and a short marginal secondary spine on opposite side; spines divergent in flower, spreading to recurved in fruit. Bracteoles linear, 8(–12) mm long, silky-hairy adaxially. Calyx brown-tipped with dorsal sepal ovate, acuminate, 13–15(–16) mm long, glabrous abaxially, silky-hairy adaxially, 7–9(–11)-veined; ventral sepal ovate, 12–

13(–15) mm long, glabrous abaxially, silky-hairy adaxially, 5–7(–9)-veined; lateral sepals 8–9(–10) mm long, glabrous abaxially, silky-hairy adaxially, especially towards base. Corolla lilac to purple with lemon-yellow throat, 25–27 × 10–12 mm, tube 8(–9) mm long, central lobe as wide as long, constricted at the base, emarginate. Filaments 7–8 mm long, glandular; anthers beige, 3 mm long. Style covered with glandular hairs at the base. Capsules 8–9 × 3 mm. Seed 3 × 3 mm.

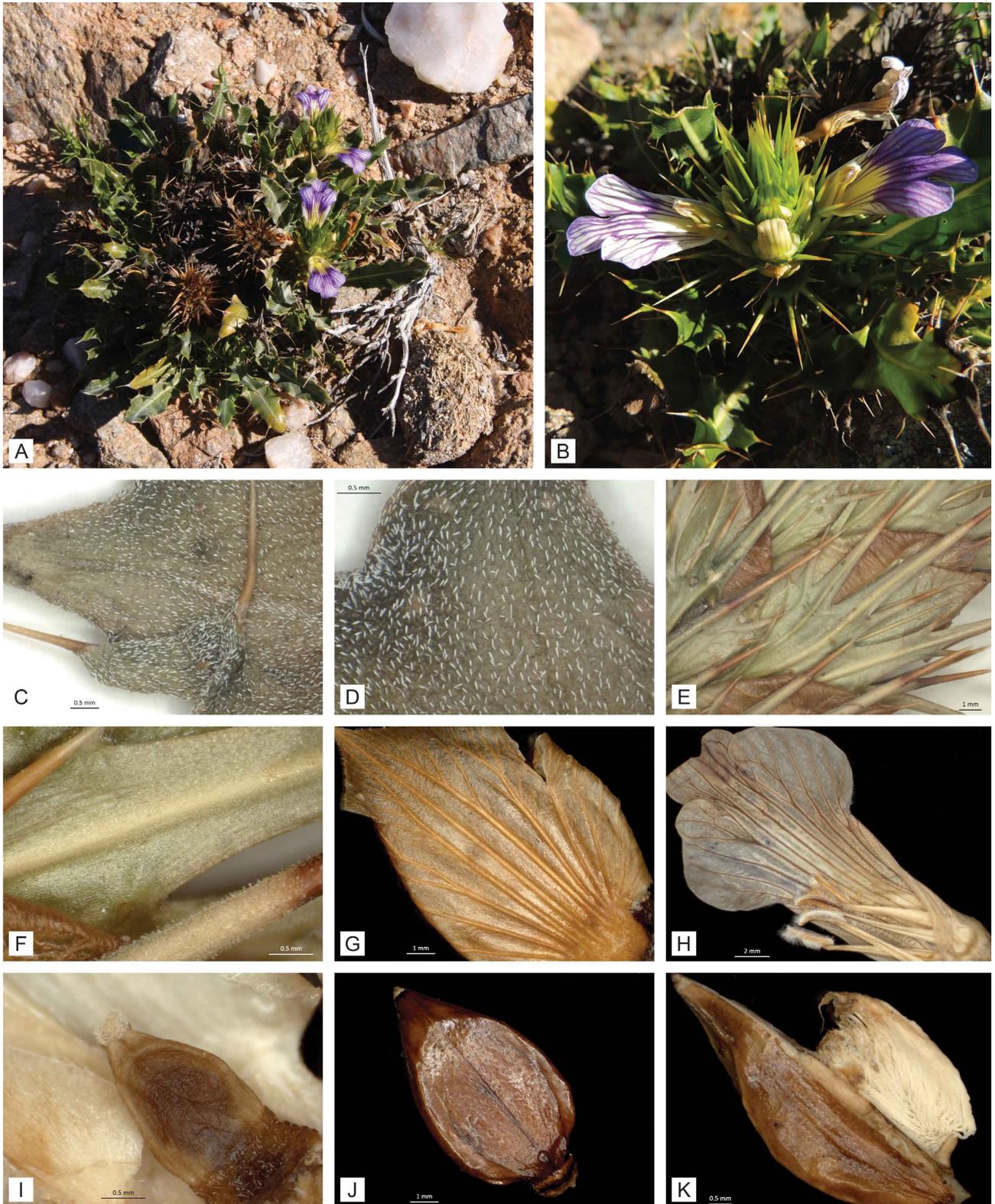


FIGURE 6. *Acanthopsis nitida*. A & B. Habit. C & D. Leaf indumentum (abaxial). E & F. Bract. G. Calyx. H. Corolla (lobes lilac to purple; throat lemon-yellow). I. Glandular hairs at base of style. J. Capsule. K. Capsule with seed. Vouchers: C–I = Steyn 1884 (PRE), J = Burgoyne 1514 (PRE), K = Steyn 2129 (PRE). Photographed by: M. Koekemoer (A & B) and H.M. Steyn (C–K).

Etymology:—The specific epithet *nitida*, meaning “shiny/glossy”, refers to the glossy leaves, floral bracts and calyx of this species.

Distribution, ecology and phenology:—*Acanthopsis nitida* is endemic to the Northern Cape and is known from three localities in an area to the west of Steinkopf (Fig. 1). It is centred in the core part of the Gariiep Centre of Endemism (Van Wyk & Smith 2001), a biogeographical region rich in restricted-range plants and animals. This distribution falls within the Succulent Karoo Biome (Rutherford & Westfall 1994, Low & Rebelo 1996, Mucina & Rutherford 2006) in the Richtersveld Bioregion, Anenous Plateau Shrubland (Mucina & Rutherford 2006) where it receives predominantly winter rains with an average of ± 150 mm per year. The specimens were collected on stony mountain slopes in well-drained sandy soils at elevations of 690–1100 m. Specimens with flowers were collected between August and October.

Conservation status:—*Acanthopsis nitida* is a range-restricted species (EOO 42 km²) known from three locations within a small area. It is potentially threatened by habitat loss and degradation due to mining and overgrazing and is categorised as Endangered B1ab(iii) according to the IUCN Red List Category and Criteria (IUCN 2012) (L. von Staden, pers. comm.).

Additional specimens examined (Paratypes):—SOUTH AFRICA. Northern Cape: Namaqualand District. Anenous Pass, S slope of mountain, 691 m, (2917BA), 22 August 2012, *Steyn 1884* (PRE); Steinkopf District; Anenous Pass; Approximately 17 km West of Steinkopf; hills on southern side of the Pass on the old road, 1100 m, (2917BC), 20 December 1992, *Burgoyne 1514* (PRE); Namaqualand District. On dirt road NW of Eyams, 838 m, (2917BC), 10 October 2015, *Steyn 2138* (PRE).

Notes:—*Acanthopsis nitida* can be easily distinguished from the other subshrubs with semi-dense inflorescences in the genus by its glossy appearance (*not* matt) and yellow-green (*not* green or grey-green) leaves. Although the central primary spine could be simple or compound (one pair of short, marginal secondary spines), the lateral primary spines always have a basal secondary spine on the side facing the central primary spine.

4. *Acanthopsis glandulopalmata* H.M.Steyn, *sp. nov.* (Figs. 1, 3D & 7)

Type:—SOUTH AFRICA. Northern Cape: Namaqualand District. On track between Anenous/Kosies to Umdaus in Wyepoort River Valley, 690 m, (2917BA), 25 August 2012, *Steyn 1890* (holotype PRE0861467!, isotype NBG01461963!).

Diagnosis:—*Acanthopsis glandulopalmata* differs from other species with semi-dense spikes and 5-fid bracts in having bracts with winged primary spines (nearly always simple) with long, glandular hairs (*not* narrow to narrowly winged primary spines with short, eglandular hairs) and a relatively large corolla of 28–32 mm long (*not* 20–25(–27) mm long).

Perennial, compact subshrub, 7–10 cm tall with very short internodes. Leaves sessile, base petiole-like with spines 3–7 mm long; lamina oblanceolate, (25–)35–50(–70) \times 5–10(–12) mm, strigose with short, white hairs, also with subsessile glandular hairs; apex acute, base attenuate, margin undulate, dentate-spinose, spines rigid, 3–6 mm long, yellow to brown. Inflorescences semi-dense, cylindrical, subsessile, 45–50(–70) mm long, 8–10(–12) mm in diameter. Bracts obovate to broadly obovate, (15–19)–24 mm long (including spines), lamina 10–11 mm long, base obtuse; lower bracts hirsute with deflexed to spreading short, white hairs, middle to upper bracts hirsute with spreading short, white hairs, together with glandular hairs abaxially, silky-hairy, also with short, white hairs and glandular hairs adaxially; middle and upper bracts ending in 5 primary spines; central primary spine usually to nearly always simple, if compound, then with 1 pair of short marginal spines (prickles); lateral primary spines nearly always simple; spines spreading to recurved in fruit. Bracteoles linear, 7–8(–11) mm long, silky-hairy with some isolated glandular hairs. Calyx with dorsal sepal ovate, acuminate, 13–14(–16) mm long, silky-hairy with some isolated glandular hairs abaxially, silky-hairy adaxially, 7–9-veined; ventral sepal ovate, 12–14 mm long, silky-hairy with some isolated glandular hairs abaxially, silky-hairy adaxially, 5–7-veined; lateral sepals 9 mm long, with some isolated glandular hairs abaxially, silky-hairy adaxially. Corolla lilac to purple with lemon-yellow throat, 28–32 \times 10–11 mm, tube 9–10 mm long, central lobe as wide as long, truncate to rounded. Filaments 7–8 mm long, glandular; anthers orange-brown, 3–4 mm long. Style with patch of glandular hairs at the base. Capsules 6–8 \times 3–4 mm. Seed 5 \times 3–4 mm.

Etymology:—The specific epithet *glandulopalmata*, meaning “glandular-palmate”, refers to the hand-shaped bracts, covered in glandular hairs.

Distribution, ecology and phenology:—*Acanthopsis glandulopalmata* is endemic to the Northern Cape and is known from three localities in an area to the north-west of Steinkopf with one outlier population north-west of Springbok (Fig. 1). It is centred in the core part of the Gariiep Centre of Endemism (Van Wyk & Smith 2001). This distribution falls within the Succulent Karoo Biome (Rutherford & Westfall 1994, Low & Rebelo 1996, Mucina & Rutherford 2006) in the Richtersveld Bioregion: Umdaus Mountain Succulent Shrubland, Anenous Plateau Shrubland

and Lekkersing Succulent Shrubland (Mucina & Rutherford 2006) where it receives predominantly winter rains with an average of 100–200 mm per year. The specimens were collected on plains with quartzite pebbles in well-drained, sandy soils at elevations between 670–700 m. *Desmet & Ellis 656* was collected at 120 m in the Namaqualand Hardeveld Bioregion where it receives <100 mm of rain per annum, but probably more frequent fog than the inland populations. Specimens with flowers were collected between August and October.

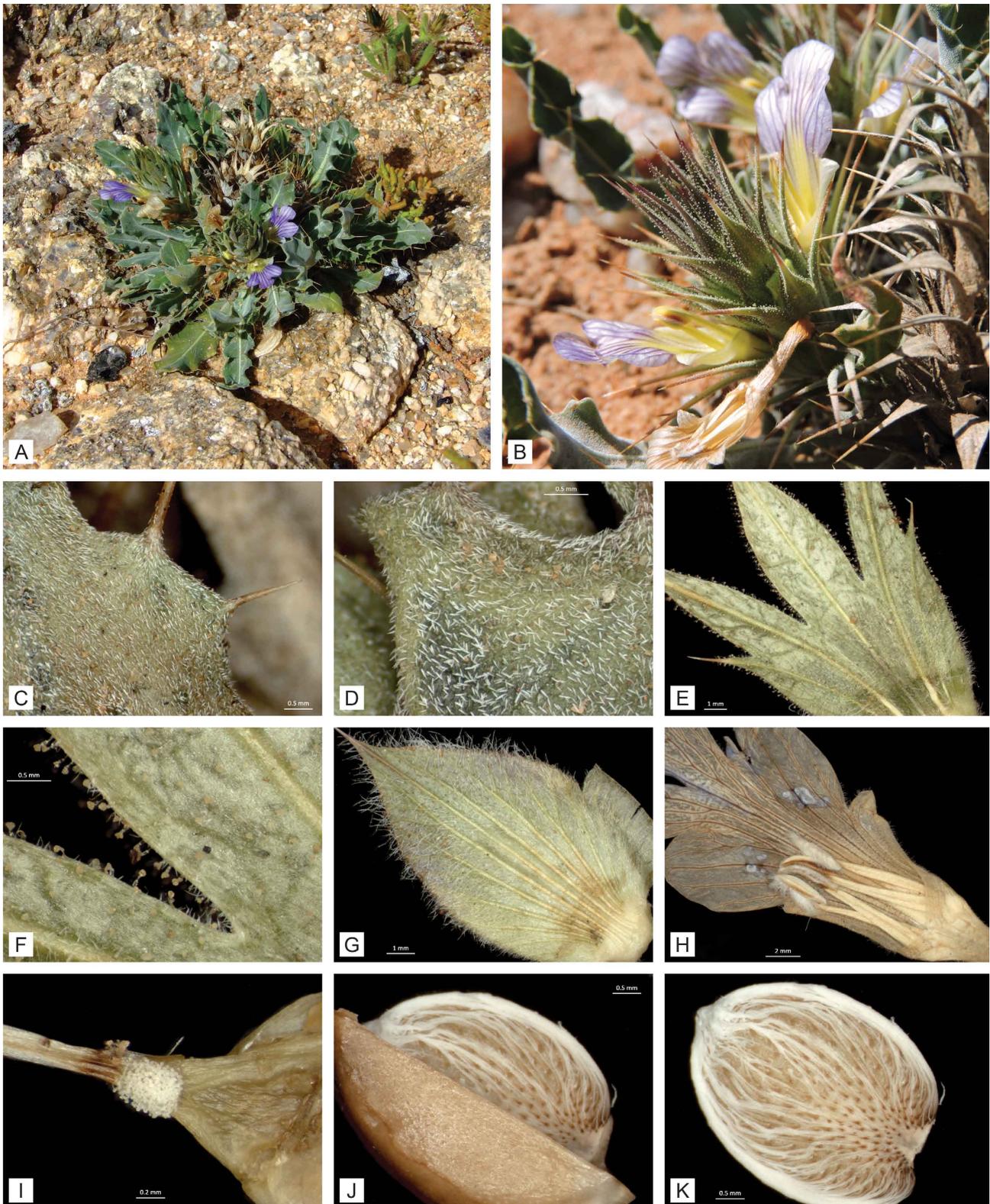


FIGURE 7. *Acanthopsis glandulopal mata*. A & B. Habit. C & D. Leaf indumentum (abaxial). E & F. Bract. G. Calyx. H. Corolla (lobes lilac to purple; throat lemon-yellow). I. Glandular hairs at base of style. J. Capsule with seed. K. Seed. Vouchers: C–I = *Steyn 2125* (PRE), J & K = *Steyn 1889* (PRE). Photographed by: M. Koekemoer (A) and H.M. Steyn (B–K).

Conservation status:—*Acanthopsis glandulopalmata* is known from four widely scattered subpopulations (EOO 1954 km²). The threats affecting this species, particularly overgrazing, is likely to affect most areas with suitable habitat, and therefore it is threatened across its range. The population is likely to be declining at all known locations. It is therefore assessed as Endangered based on precautionary principles (Endangered B1ab(iii)) according to the IUCN Red List Category and Criteria (IUCN 2012) (L. von Staden, pers. comm.), but may need to be downlisted in future if further field surveys indicate that there are more than four subpopulations. Further field surveys are needed to gain a better understanding of the population structure and abundance of this species.

Additional specimens examined (Paratypes):—SOUTH AFRICA. Northern Cape: Tussen Ploegberg en Stinkfonteinberge, 550 m, (2817CA), 15 September 1985, *Zietsman & Zietsman 773* (NMB, PRE, PRU); Namaqualand; ± 16 mi. NW of Steinkopf (Hangbal River), 2200 ft [670 m], (2917BA), 8 October 1956, *Leistner 797* (PRE); Namaqualand District. On track between Anenus/Kosies to Umduas in Wyepoort River Valley, 697 m, (2917BA), 25 August 2012, *Steyn 1889* (PRE); Namaqualand District. Wyepoort River Valley, 695, (2917BA), 9 October 2015, *Steyn 2125* (PRE); Nuttabooi Kleinzee, Nuttabooi mining area approximately 40 km from Kleinzee on the Springbok road, south bank of Buffels, 120 m, (2917CB), 21 June 1997, *Desmet & Ellis 956* (NBG).

Desmet & Ellis 956 has greyish leaves covered with densely packed appressed hairs. It was collected at a much lower elevation and in a different bioregion than the rest of the specimens, and is here included in *A. glandulopalmata* based on the semi-dense inflorescences with palmate bracts. However, the inflorescence is very narrow and no glandular hairs are visible on the bracts, as the inflorescences are old (probably from the previous season).

5. *Acanthopsis insueta* H.M.Steyn, *sp. nov.* (Figs. 1, 3E & 8)

Type:—SOUTH AFRICA. Northern Cape: Namaqualand District. Richtersveld National Park. Vyftienmylberg; on track to top of mountain, 292 m, (2917AA), 7 September 2010, *Steyn 1805*, (holotype PRE0861485!; isotype NBG!).

Diagnosis:—*Acanthopsis insueta* differs from *A. glandulopalmata* in having middle to upper bracts ending in (3–)5 ensiform or narrowly winged primary spines (*not* 5 winged primary spines) and the lateral spines usually with a basal secondary spine on the side facing the central primary spine (*not* lateral spines always simple) and from *A. carduiifolia* in having grey leaves with appressed hairs (*not* green leaves with strigose hairs) and bracts with secondary spines often longer than primary spines (*not* secondary spines always shorter than primary spines) and a lemon-yellow (*not* cream or white) corolla throat.

Perennial, compact subshrub, 15 cm tall with very short internodes. Leaves sessile, decurrent, base petiole-like with spines 3–6 mm long; lamina oblanceolate, (25–)35–50(–70) × 8–10(–12) mm, grey with appressed, densely packed short hairs; apex acute, base attenuate, margin undulate, dentate-spinose to coarsely dentate-spinose, spines rigid, 4–7(–8) mm long, yellow to dark brown. Inflorescences semi-dense, cylindrical, subsessile, ca. 35–45 mm long, 8–10(–12) mm in diameter. Bracts obovate to wedge-shaped, 11–13 mm long (including spines), lamina 5–8 mm long; spines and lamina pubescent to hirsute with deflexed to spreading short hairs, lamina often with isolated long white hairs abaxially, silky-hairy adaxially; lower bracts ending in 5 primary spines; middle and upper bracts ending in (3–)5 primary spines, upper bracts very often 3-fid (see Figs. 3 & 8); central primary spine usually simple or with short marginal secondary spines; lateral primary spines usually with long basal secondary spine on side facing central primary spine, often longer than primary spines; spines spreading to recurved in fruit;. Bracteoles linear, 4–5(–6) mm long, silky-hairy. Calyx with dorsal sepal ovate, acuminate, 11–12 mm long, silky-hairy especially abaxially, 7–9-veined; ventral sepal ovate, 9–11 mm long, silky-hairy especially abaxially, 5–7-veined; lateral sepals 9 mm long, silky-hairy. Corolla lilac to purple with lemon-yellow throat, 25 × 10 mm, tube 9 mm long, central lobe wider than long, constricted at base, emarginate. Filaments 6 mm long, glandular; anthers beige to orange-brown, 3 mm long. Style with patch of glandular hairs at the base. Capsules 8 × 3–4 mm. Seed 5 × 3 mm.

Etymology:—The specific epithet *insueta*, meaning “unusual”, refers to the unusual combination of middle to upper floral bracts ending in 3 or 5 primary spines.

Distribution, ecology and phenology:—*Acanthopsis insueta* is endemic to the Vyftienmylberg (Northern Cape) and is known from two localities (Fig. 1). It is centred in the core part of the Gariep Centre of Endemism (Van Wyk & Smith 2001). This distribution falls within the Succulent Karoo Biome (Rutherford & Westfall 1994, Low & Rebelo 1996, Mucina & Rutherford 2006). It is found in the Richtersveld Bioregion, Vyftienmyl se Berge Succulent Shrubland (Mucina & Rutherford 2006) where it receives predominantly winter rains with an average of 60–120 mm per year (including considerable amounts of fog). The specimens were collected on mountain slopes associated with quartzite stones in well-drained, sandy soils at elevations between 230 and 445 m. Specimens with flowers were collected in August (probably also flowers into September).

Conservation status:—*Acanthopsis insueta* is a highly localized Richtersveld endemic (EOO <10 km²). This species is known from a small area on the northern section of the summit of Vyftienmyl-se-Berg, an inselberg that is home to many local endemics. As there are no severe threats, the population is not likely to be declining. As its habitat is well-protected and the species is not in danger of extinction, it is given a status of Critically Rare (L. von Staden, pers. comm.).

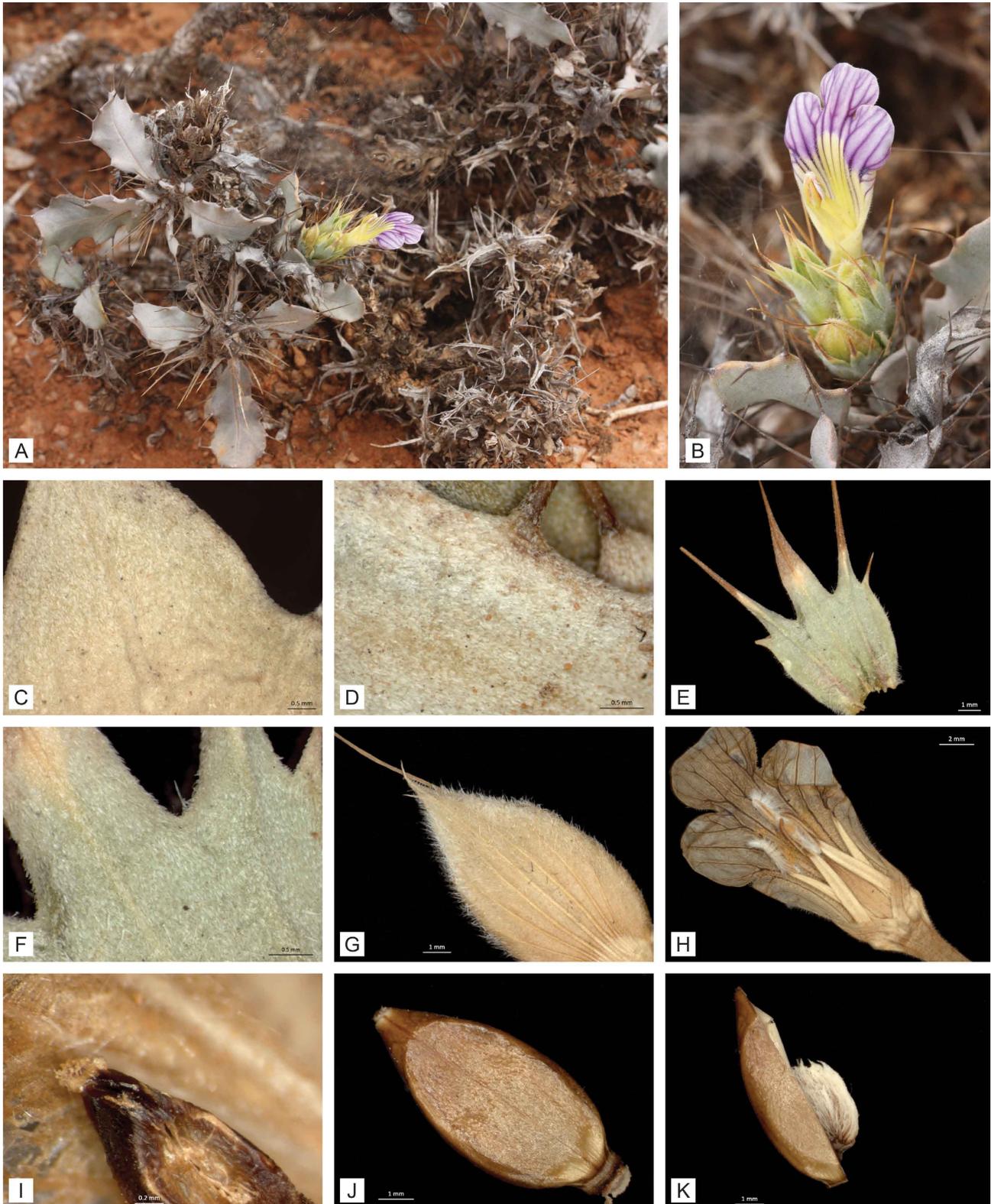


FIGURE 8. *Acanthopsis insueta*. A & B. Habit. C & D. Leaf indumentum (abaxial). E & F. Bract. G. Calyx. H. Corolla (lobes lilac; throat lemon-yellow). I. Glandular hairs at base of style. J. Capsule. K. Capsule with seed. Vouchers: C–K = Steyn 1805 (PRE). Photographed by: H.M. Steyn (A–K).

Additional specimen examined (Paratype):—SOUTH AFRICA. Northern Cape: Namaqualand District. Richtersveld National Park. Vyftienmylberg; top of mountain, 444 m, (2917AA), 9 September 2010, *Steyn 1806* (PRE!).

Notes:—In the case where *Acanthopsis insueta* has trifid bracts, it differs from *A. glauca* in having sessile inflorescences and bracts with primary spines of approximately the same length (*not* pedunculate inflorescences and bracts with central primary spine much longer than lateral spines) and from all other species with trifid bracts in having ensiform spines (*not* ovate, mucronate to spinose lobes).

6. *Acanthopsis carduifolia* (L.f.) Schinz (1890: 200); Clarke (1901: 33); Snijman (2013: 163) (Figs. 1, 3F & 9)

Basionym:—*Acanthus carduifolius* Linnaeus (1782: 294). *Blepharacanthus carduifolius* (L.f.) Nees in Steudel (1840: 209). *Acanthodium carduifolium* (L.f.) Nees von Esenbeck (1847: 278), pro parte. *Blepharis carduifolia* (L.f.) Anderson (1864: 35), pro parte. “*Acanthus carduifolius* Thunb.” in Drège (1837: 2), *nom nud.*

Type:—SOUTH AFRICA. Northern Cape: Cap. bona Spei. Cape of Good Hope, Crescit in rupibus Hantum [Hantam], fide Thunberg (1823)], *Thunberg 83* (lectotype LINN816.2! designated here).

Perennial, compact subshrub, (5–)7–10(–12) cm tall with very short internodes. Leaves sessile, base petiole-like with spines 3–5 mm long; lamina oblanceolate, 35–45(–70) × 4–6(–10) mm, puberulent to hirsute with strigose to spreading short hairs, also with subsessile glandular hairs; apex acute, base attenuate, margin undulate, coarsely dentate-spinose, spines rigid, 2–4 mm long, yellowish, often reddish towards base. Inflorescences semi-dense, cylindrical, subsessile to shortly pedunculate with 3 (or 4) pairs of peduncular bracts at the base, (25–)40–60(–90) mm long, 6–9(–10) mm in diameter; peduncle up to 20 mm long, pubescent with spreading hairs. Bracts obovate to wedge-shaped, 17–23 mm long (including spines), lamina 7–9(–11) mm long, base attenuate; hirsute to pubescent with deflexed or spreading short hairs and short to subsessile glandular hairs abaxially, silky-hairy adaxially, lamina rarely villose with long spreading, antrorse hairs (see *Pearson 3346*, BOL); middle and upper bracts ending in 5 primary spines; central primary spine usually simple or occasionally with 1 pair of very short, marginal secondary spines; lateral primary spines often with 1 basal secondary spine on side facing central primary spine; spines often porrect in flower, porrect to recurved in fruit. Bracteoles linear, 7–8 mm long, silky-hairy, especially towards base. Calyx with dorsal sepal ovate, apiculate, 11–12 mm long, silky-hairy especially adaxially, 7(–9)-veined; ventral sepal ovate, 10–11 mm long, 5–7-veined, silky-hairy especially adaxially; lateral sepals 7 mm long, silky-hairy especially adaxially, often with fringe of long, silky hairs around margin, 3-veined from base. Corolla white or cream to lilac with purple veins and white or cream throat, 20–25(–27) × 8–10(–12) mm, tube 5–8(–10) mm long, central lobe wider than long or equal, constricted at the base, emarginate. Filaments 6–7 mm long, glandular; anthers beige to orange, 3 mm long. Style with patch of glandular hairs at the base. Capsules 8–9 × 3 mm. Seed 3 × 3 mm.

Etymology:—The specific epithet *carduifolia* refers to its leaves resembling those of the genus *Carduus* Linnaeus (1753: 820).

Distribution, ecology and phenology:—*Acanthopsis carduifolia* is near-endemic to the Hantam-Roggeveld Centre of Endemism (Van Wyk & Smith 2001) and is known from a few locations in an area to the north-west of Calvinia (Northern Cape) (Fig. 1). This distribution falls within the Succulent Karoo Biome (Rutherford & Westfall 1994, Low & Rebelo 1996, Mucina & Rutherford 2006) in the Trans-Escarpment Succulent Karoo Bioregion (Mucina & Rutherford 2006) where it receives predominantly winter rains with an average of ± 200 mm per year. This species prefers loamy soils derived from Ecca shale but is also found on sandy soils to the north of the distribution range, and mainly grows on hill slopes at elevations between 550 and 960 m. Specimens with flowers were collected from September to November.

Conservation status:—A range-restricted (EOO 2614 km²) and rarely recorded species that is likely to be under-sampled, as it occurs in a botanically poorly explored area. There are no severe threats to this species and subpopulations are large, therefore it is not suspected to be in danger of extinction. Field observations indicate that this species is fairly abundant even in heavily overgrazed areas, suggesting that it is likely to be resilient to disturbance and hence is categorised as Least Concern according to the IUCN Red List Category and Criteria (IUCN 2012) (L. von Staden, pers. comm.).

Additional specimens examined:—SOUTH AFRICA. Northern Cape: Upper Namaqualand and Karroo, Alewyn’s fontein, (3018BC), 22 December 1908, *Pearson 3318* (BOL); Little Namaqualand. In sand at foot of kopje – Alewyn’s Fontein, 22 December 1908, *Pearson 3346* (BOL); Namaqualand District. South of Alewynfontein, on koppie W of road to Platbakkies, 961 m, 29 September 2015, *Steyn 2106* (PRE); Namaqualand and Bushmanland, about 10 miles [16 km] north east of Klipplaat, (3019CC), December 1908, *Pearson 3308* (BOL, SAM in NBG); 40

km NW of Calvinia on Naresie road, 640 m, (3119AD), December 2013, *Scholtz s.n.* (PRE); Calvinia District. NW of Calvinia on Gannabos/Naresie road, 549 m, (3119AD), 30 September 2015, *Steyn 2108* (PRE); North of Calvinia on the Toren road, 960 m, (3119BC), 22 October 2014, *Koekemoer 4620* (PRE); Calvinia District. N of Calvinia; 23.5 km on Loeriesfontein road - turn right at Toren turn-off, (3119BC), 31 August 2012, *Steyn 1894* (PRE); Calvinia District. On Toren road, 956 m, (3119BC), 30 September 2015, *Steyn 2109* (PRE).

Without precise locality: *Masson s.n.* (BM); *Thunberg s.n.* (P), *Thunberg 84* (SBT), *Thunberg s.n.* (UPS).

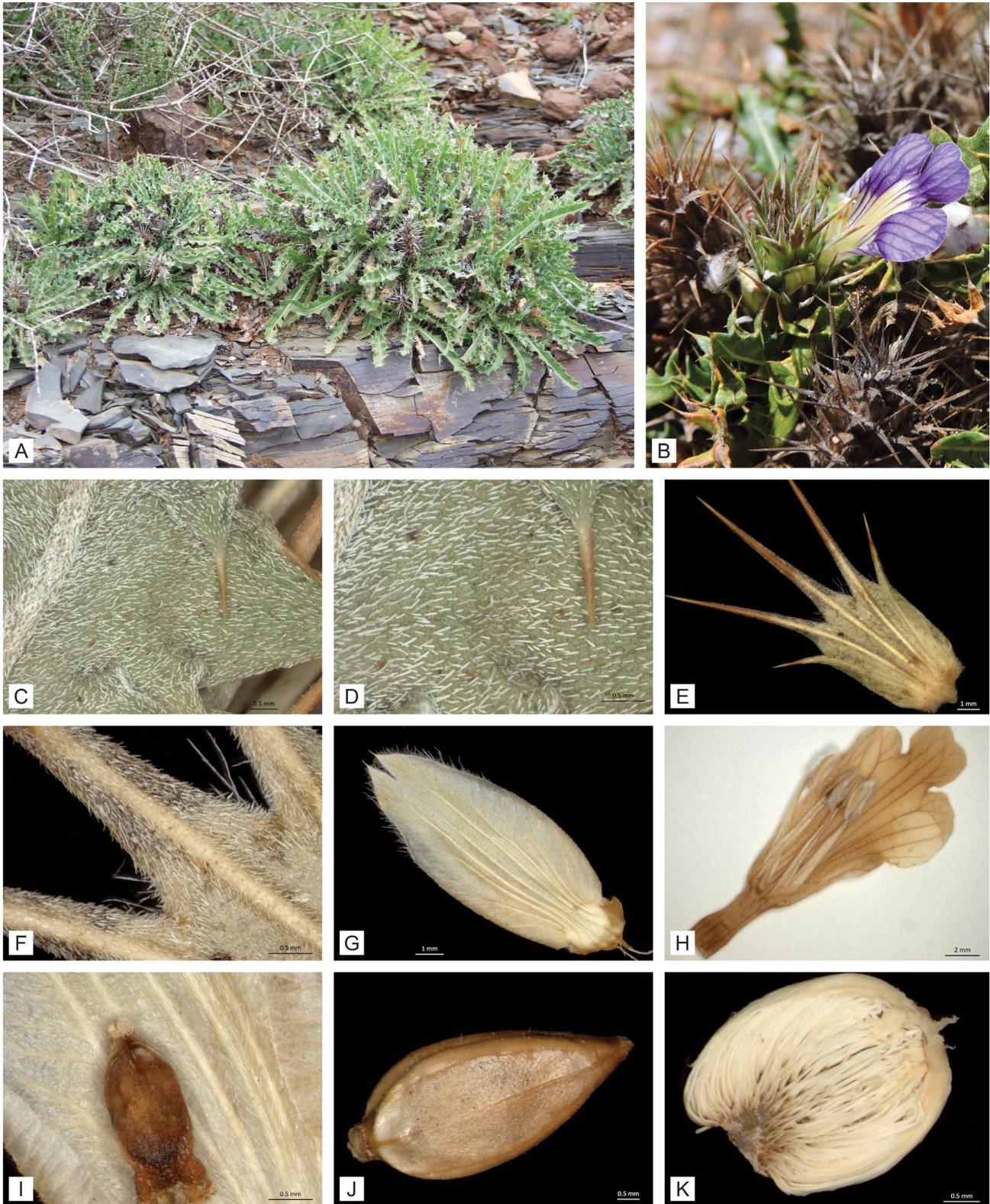


FIGURE 9. *Acanthopsis carduiifolia*. A & B. Habit. C & D. Leaf indumentum (abaxial). E & F. Bract. G. Calyx. H. Corolla (lobes cream to lilac; throat cream or white). I. Glandular hairs at base of style. J. Capsule. K. Seed. Vouchers: C–I = *Koekemoer 4620* (PRE), J = *Steyn 2106* (PRE), K = *Steyn 2108* (PRE). Photographed by: M. Koekemoer (A) and H.M. Steyn (B–K).

Notes:—*Acanthopsis carduiifolia* differs from *A. villosa* H.M.Steyn in Steyn & Van Wyk (2015: 14) in having semi-dense inflorescences with hirsute bracts ending with a simple central primary spine (*not* dense inflorescences with densely villose bracts ending with a compound central primary spine), and the white-cream to lilac flowers with purple veins (*not* purple flowers with darker veins) and strigose leaves (*not* densely villose leaves). *Acanthopsis carduiifolia* can be distinguished from *A. glabra* by the smaller flowers, the obovate to wedge-shaped (*not* oblong to obovate) bracts with an attenuate (*not* cuneate) base, the bract spines usually being longer than the bract lamina (*not* occasionally longer than lamina), and the much shorter inflorescences ((25–)40–60(–90) mm long) (*not* (50–)70–140(–250) mm long).

The earliest known herbarium specimen of a member of what is at present classified as *Acanthopsis*, was probably “*Acanthus carduiifolius* Thunberg” collected by Carl Pehr (Peter) Thunberg in the Hantam (region surrounding the present-day town of Calvinia in the Northern Cape) during November 1774. A specimen housed in Paris (*Thunberg(?) s.n.*) (P04426164), is labelled “*Acanthus carduiifolius* Thunberg” in Thunberg’s handwriting. The name *Acanthus carduiifolius* was validly published by the younger Linnaeus (1782: 294) based on a collection claimed to be collected by Anders Sparrman from “Cap. bonae Spei” [Cape of Good Hope, South Africa]. What is most probably the sheet used by the younger Linnaeus (Linnean Herbarium: LINN 816.2) gives no information on the collector or locality, only the number 83 and the name *Acanthus acaulis* in the older Linnaeus’ hand. In addition, the epithet “*acaulis*” has been deleted and replaced with “*carduiifolia*”. It is inferred that this collection was collected by Thunberg as the first known botanical exploration into the Hantam region was done by Thunberg and Francis Masson in 1774 when they travelled to the Roggeveld via the Hantam (Forbes 1986, Glen & Germishuizen 2010). Both Thunberg and Masson collected *Acanthus* (= *Acanthopsis*) specimens on this trip: *Thunberg s.n.* (P04426164), *Thunberg s.n.* (UPS V-14645), *Thunberg 83* (LINN 816.2), *Thunberg 84* (SBT12606) and *Masson s.n.* (BM000810289, BM000810290). These specimens could only have been from the Hantam region as no other member of *Acanthopsis* are known to occur anywhere else along the route they followed (Fig. 1).

In 1837 Jean François (Johann Franz) Drège listed the name *Acanthus carduiifolius* (Drège 1837: 2). Meyer in Drège (1843: 69, 91) recorded it as being collected twice by Drège during October 1830 at “Kaus (Gebirge bei Goedemanskraal, Rustbank und Kookfontein), 3000–4000 ft” and November 1830 at “Bei Ezelsfontein und am Roodeberg, 3500–4000 ft” respectively. The “Alphabetisches Verzeichniss” [Alphabetical List] (Drège 1843: 161), however, indicates that two different forms (*not* the typical form *sensu* Thunberg) were collected, namely [variety] α (“Bei Ezelsfontein und am Roodeberg”) and [variety] β (“Kaus (Gebirge bei Goedemanskraal, Rustbank und Kookfontein)”). A sheet in the Paris Herbarium (*Drège 2431*) (P04426162) is labelled with “*Acanthus carduiifolius* Th. α *spica glabriuscula* EM.” [E.Meyer] in Meyer’s handwriting. This form was listed as being collected only once by Drège (1843) and possible duplicate sheets of *Drège 2431* are found in Paris and Stockholm (*Drège s.n.*) (P04426165) and (*Drège s.n.*) (S09-4229, S11-26492), labelled by Meyer, Drège and Meyer respectively. One Stockholm sheet (S11-26492) was labelled with an incorrect locality as this form (α *spica glabriuscula*) was collected at Ezelsfontein and Roodeberg (Drège 1843) and *not* at Kaus as indicated on the specimen label. These sheets are now considered to be *A. scullyi*. Only one sheet of Drège’s *Acanthus carduiifolius* Th. β *spica villosa* EM. [E.Meyer] could be traced to the Paris Herbarium (*Drège 2433*) (P04426163) and was labelled by Meyer. The latter name (based on the Drège specimen) is now regarded as a synonym of *Acanthopsis villosa* H.M.Steyn in Steyn & Van Wyk (2015: 14).

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