

THYMELAEACEAE

LASIOSIPHON RIGIDUS, A NEW SPECIES FROM THE TANKWA KAROO AND TWO NEW COMBINATIONS IN THE GENUS FOR SOUTH AFRICA

Thymelaeaceae are well represented in southern Africa, with \pm 190 species in nine genera (Bredenkamp & Beyers 2000; Beaumont *et al.* 2009). Preliminary phylogenetic analyses of nuclear and plastid DNA sequences (Van der Bank *et al.* 2002; Beaumont *et al.* 2009) indicate the need for substantial revision in the generic circumscriptions in subfamily Thymelaeoideae. This is especially evident in the large and diverse

genus *Gnidia* L., with > 140 spp. in tropical and southern Africa and Madagascar. *Gnidia* is evidently highly polyphyletic as currently circumscribed and is represented by at least four distinct lineages scattered throughout the Thymelaeoideae. As a first step towards a monophyletic generic classification of the subfamily, Beaumont *et al.* (2009) reinstated the genus *Lasiosiphon* Fresen., originally distinguished from *Gnidia* and allied tetramerous genera by its pentamerous flowers but subsequently included within *Gnidia* by Petersen (1959, 1978) on account of the evident instability of this character. Molecular analyses retrieved a monophyletic *Lasiosiphon* clade (comprising all pentamerous species of *Gnidia sensu lato* plus some tetramerous species) that was separated from the remaining *Gnidia* species by a well-supported clade comprising the genera *Dirca* L., *Ovidia* Raf., *Peddiea* Harv. and *Stephanodaphne* Baill. (Beaumont *et al.* 2009). Secondary characters diagnostic for *Lasiosiphon* are the capitate, involucrate inflorescences subtended by foliaceous or petaloid bracts, the pubescent hypanthium, and the waxy, bright yellow to orange or red hypanthium lobes. With the inclusion of tetramerous species, the genus is diagnosable only by a combination of characters. Like *Gnidia*, it also includes some species with ebracteate, few-flowered inflorescences plus taxa with and without petaloid scales in the mouth of the hypanthium (Beaumont *et al.* 2009). *Lasiosiphon* currently numbers some 35 spp. from Africa and Madagascar, with \pm 20 recorded from southern Africa (Wright 1915).

Here we describe a distinctive new species of *Lasiosiphon* endemic to the Tankwa [Tanqua] Karoo, previously misidentified and illustrated as *Gnidia microphylla* Meisn. (Van der Merwe 2010). It is distinguished by its rigid, divaricately branched habit, small, glabrous leaves, capitate inflorescences with bright yellow and reddish petaloid involucre bracts, and flowers lacking petaloid scales (Figure 1). The specific epithet alludes to its characteristic habit. The species appears to have been first collected by J.P.H. Acocks in 1956, and has been consistently misidentified as *G. microphylla* (now *L. microphyllum*) since then.

We consulted the collections in BOL, NBG, PRE and SAM (acronyms after Holmgren *et al.* 1990) as these contain the most extensive holdings of the southern African winter rainfall flora, and studied the species in the field.

We also take this opportunity to provide new combinations for *Gnidia pedunculata* Beyers and *G. sericocephala* (Meisn.) Gilg. ex Engl., which accord with *Lasiosiphon* in all critical morphological characters but lack combinations in this genus.

***Lasiosiphon rigidus* J.C.Manning & Boatwr., sp. nov.**

Resembling *Lasiosiphon microphyllum* (Meisn.) Meisn. and *L. polycephalus* (C.A.M.Mey.) H.Pearson in the involucrate flower heads surrounded by petaloid bracts, but differing in the rigid, divaricately branched habit and five caducous involucre bracts, which are apiculate, yellow flushed with dark red and subglabrous or shortly sericeous with straight hairs; *L. microphyllum* has ascending branches, 5–8, obtuse, persistent involucre

bracts, which are yellow to green and densely pubescent with crisped hairs; *L. polycephalus* has a virgate habit and 3–6, obtuse, persistent involucre bracts, which are yellow or reddish brown and densely sericeous with broad, hairless margins.

TYPE.—South Africa, Northern Cape, 3219 (Wuppertal): Tankwa [Tanqua] Karoo National Park, SW foot of Leeuwig, along drainage lines, (–BB), 20 June 2012, Manning 3363 (NBG, holo.; K, MO, PRE, iso.).

Rigid, densely divaricately branched shrublet up to 0.6(–1.0) m high, branches suberect to spreading, sparsely leafy and glaucous when young but later developing grey, fissured bark. *Leaves* alternate, suberect or \pm spreading, rather distant, shortly petiolate, blade obovate to oblanceolate, 5–10(–12) \times (1.5–)2.0–4.0 mm, obtuse to acute, plane or shallowly concave, leathery, glaucous, midrib weakly raised beneath, petiole 0.2–0.5 mm long. *Inflorescence* terminal on main and lateral branches, capitate, bracteate, \pm 15–30-flowered, branches becoming hard and thorny with age; involucre bracts 5, ovate, 10–11 \times 5–6 mm, yellow \pm flushed wine-red or entirely maroon, papery, faintly nervate, apiculate, subglabrous to densely sericeous, caducous and mostly fallen at flowering. *Flowers* chrome-yellow with maroon tube, unscented during day but strongly lilac-scented at night; pedicel \pm 1 mm long, densely appressed pubescent; hypanthium 13–18 mm long, circumscissile 4.5–6.0 mm from base, basal portion narrowly ovoid, densely sericeous with long, ascending, silvery to golden hairs 2–5 mm long, upper portion tubular but inflated and subglobular in distal 1.5 mm, densely appressed pubescent with straight, sericeous hairs \pm 1 mm long in lower portion but becoming villous with crisped hairs distally, especially on distal swelling; sepals 5, spreading, ovate, 4–5 \times 2.0–2.5 mm, glabrous and waxy above but villous beneath, margins revolute and apex reflexed, thus apparently oblong-emarginate and \pm 1.5 mm wide. *Petaloid scales* 0. *Stamens* 4 + 4, subsessile; outer whorl inserted 0.5 mm below rim of hypanthium, half-exserted; inner whorl inserted at base of bulge \pm 1.5 mm within throat of hypanthium, fully included; anthers \pm 1 mm long at anthesis. *Ovary* ellipsoid and attenuate basally, \pm 2 mm long, sparsely sericeous; style inserted laterally, included and reaching less than halfway up hypanthium, \pm 4.5 mm long, stigma penicillate. *Fruit* not seen. *Flowering time*: June–Sept. Figures 1, 2.

Distribution and ecology: evidently endemic to the central and eastern parts of the Tankwa Karoo, an arid basin between the Cedarberg and Roggeveld Mtns (Figure 3); the species is best known from around the Elandsberg, especially along the SW foot of the Leeuwig. It is restricted to loamy soils on the banks and margins of seasonal washes and drainage lines and is never abundant. Plants are typically found growing through other, often strongly thorny or prickly shrubs.

Lasiosiphon rigidus is one of several shrubby species marking seasonal drainages in the Tankwa, others being *Osteospermum sinuatum* (DC.) Norl., *Berkheya spinosa* (L.f.) Druce, *Erioccephalus microphyllum* DC. and *Pteronia villosa* L.f. (all Asteraceae), *Aridaria noctiflora* (L.) Schwantes (Aizoaceae), and *Melolobium candicans* (E.Mey.) Eckl. & Zeyh. (Fabaceae).

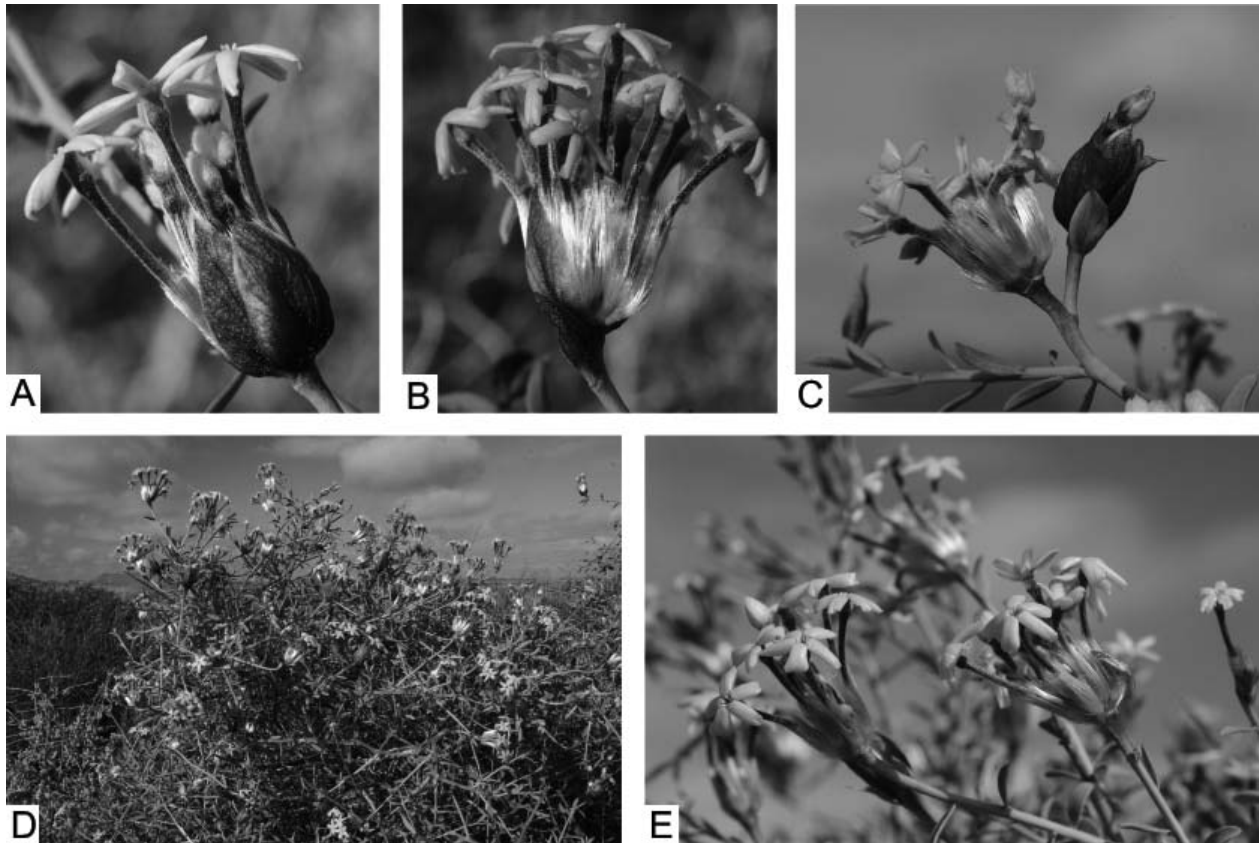


FIGURE 1.—Morphology and habit of *Lasiosiphon rigidus*. A–C, E, inflorescences with flowers at various stages; D, rigid, divaricately branched shrubby habit. Photographs: John Manning.

Diagnosis and relationships: although initially confused with *Lasiosiphon microphyllus*, a microphyllous subshrub from drier interior South Africa with similar involucre flower heads surrounded by petaloid bracts, *L. rigidus* is distinguished by its very different growth form and by the shape and vestiture of the involucre. *L. microphyllus* is a low-growing subshrub producing slender ascending stems with \pm appressed leaves, and virgate flowering branches 0.5–0.8 mm in diameter and leafy to the tips, with the uppermost leaves grading into 5–8 involucre bracts. The bracts persist through the flowering period and are obtuse and densely pubescent with crisped hairs. From herbarium specimens they appear to be pale yellow or greenish in colour. *L. rigidus* is a rigid, divaricately branched shrub with suberect or \pm spreading leaves and short flowering branches 1.0–1.5 mm in diameter, with the uppermost leaves distant and well differentiated from the strictly five involucre bracts. These are apiculate and subglabrous or shortly sericeous with straight hairs. The yellow bracts are almost completely flushed with dark wine red and are caducous, abscising soon after anthesis so that the flowers are left exposed. Although *L. microphyllus* is described as having small petaloid glands (Wright 1915), all the specimens that we have examined lack these glands.

Lasiosiphon rigidus is evidently also allied to *L. polycephalus* (C.A.Mey.) H.Pearson, a virgate subshrub widespread through the drier parts of the subregion, with similar scanty foliage and flowers in heads surrounded by yellow to reddish brown petaloid involucre bracts and lacking petaloid scales. It is recognised by its wiry,

well-branched stems with sharply ascending branches and numerous, small flower heads with less than ten flowers, subtended by densely sericeous bracts that are characterised by their broad, hairless margins. These three species all share densely sericeous fruits with very long hairs and appear to comprise a group of closely allied taxa from the arid South African interior.

Additional specimens seen

NORTHERN CAPE.—**3119** (Calvinia): Klipbank, SW of Calvinia on lower N slopes, (–DD), 23 July 1956, *Acocks 18870* (PRE). **3219** (Wuppertal): Tankwa Karoo National Park, Biesiesfontein, (–BB), 22 July 2006, *Manning 3014* (NBG); Tankwa Karoo National Park, foot of Leeuberg, (–BB), 3 Aug. 2006, *Sachse 48* (PRE); Tankwa Karoo National Park, N end of Leeuberg, E of Varsfontein, (–BB), 16 Aug. 2007, *Helme 4710* (NBG); Doornrivierkruising met Ceres, Sutherland pad, (–BC), 9 Jul. 1991, *Van Zyl 4198* (NBG); Tankwa Karoo National Park, Grasberg South 1103, (–BC), 16 Aug. 2008, *Steyn 1446* (PRE); Tankwa Karoo National Park, track to Volmoersfontein, S of Potkleiberg, (–BD), 6 Aug. 2009, *Steyn 1525* (PRE); Tankwa Karoo National Park, track between Luiperdskop and Varsfontein, (–BD), 15 Aug. 2011, *Steyn 1862* (PRE). **3220** (Sutherland): Tankwa Karoo National Park, Farm Leeukloof 114, slope W of Leeukloof, (–AC), Sept. 2007, *Sachse 618* (PRE).

WESTERN CAPE.—**3219** (Wuppertal): Farm Koffiewater, (–BC), 4 Aug. 2007, *Bester 7722* (PRE); **3220** (Sutherland): Tankwa Karoo National Park, near Paulshoek, (–AC), 27 Aug. 2004, *Steyn 624* (PRE); Bantamsfontein Kop (–CC), 17 June 1965, *Acocks 23667* (PRE).

Imprecise locality: Ceres Karoo, 13 May 1946, *Nel s.n. STE26832* (NBG, 3 sheets).

New combinations

With the reinstatement of the genus *Lasiosiphon* by Beaumont *et al.* (2009), it is necessary to provide combi-

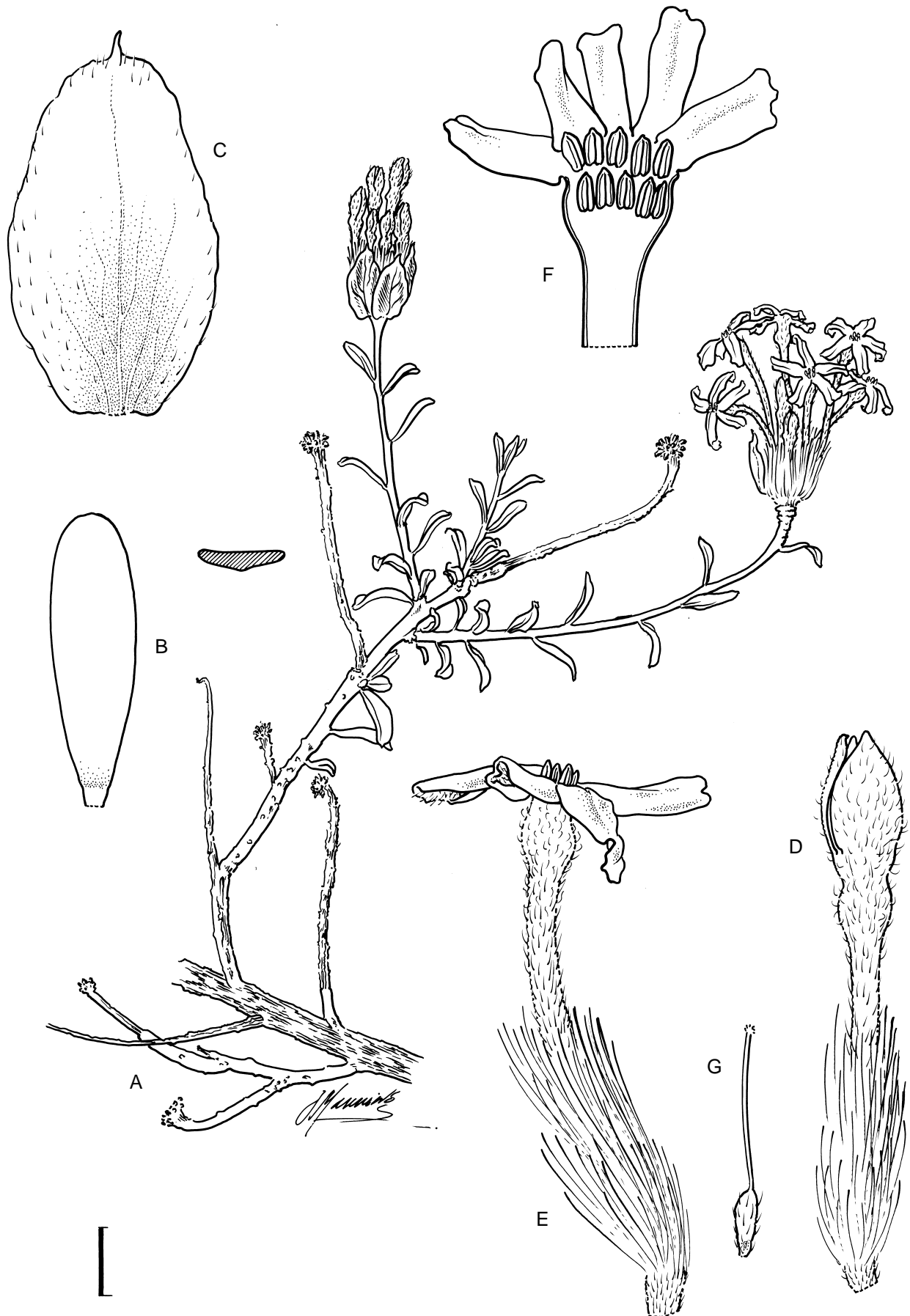


FIGURE 2.—*Laiosiphon rigidus*, Manning 3363. A, flowering branch; B, leaf and leaf T/S; C, involucral bract; D, bud; E, flower; F, open flower with detail of androecium; G, gynoecium. Scale bar: A, 10 mm; B–G, 2 mm. Artist: John Manning.

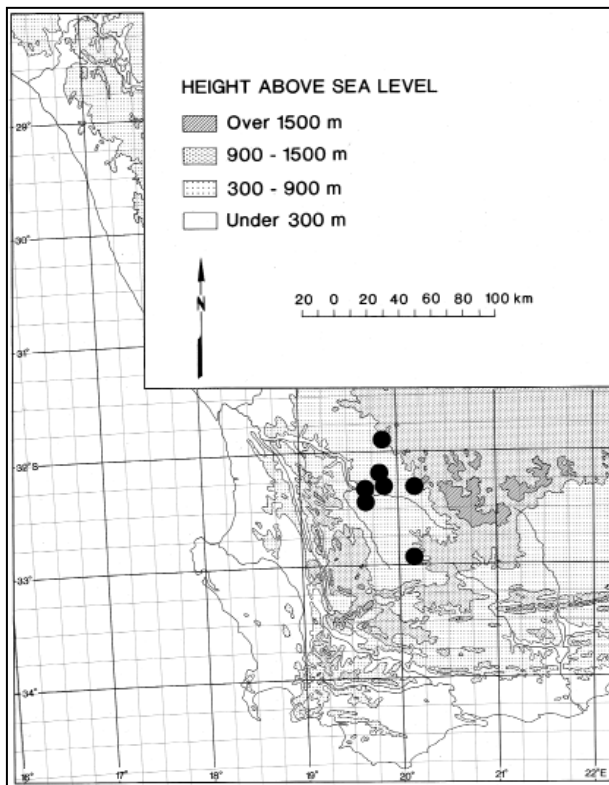


FIGURE 3.—Distribution of *Laiosiphon rigidus*.

nations for the following two species.

Gnidia pedunculata is a narrow endemic of the Knersvlakte resembling the group of three species of *Laiosiphon* discussed above in its glabrous stems and leaves and \pm capitate inflorescences with petaloid involucre bracts and waxy, golden yellow flowers with a pubescent hypanthium. It differs from them in its tetramerous flowers with small petaloid scales.

Gnidia sericocephala was one of 11 species treated by Wright (1915) in the genus *Arthrosolen* C.A.Mey., which was distinguished from *Gnidia* by the absence of petaloid scales. This character is now known to be variable within both *Gnidia* and *Laiosiphon*, and *Arthrosolen* was treated as a synonym of *Gnidia* by Peterson (1959, 1978). The three species with pentamerous flowers should, however, be included in *Laiosiphon*. Combinations in *Laiosiphon* exist for two of the species, viz. *L. polycephalus* (C.A.Mey.) H.Pearson and *L. calocephalus* (C.A.Mey.) Domke, but not for the third, *Gnidia sericocephala*.

***Laiosiphon pedunculatus* (Beyers) J.C.Manning & Boatwr., comb. nov.** *Gnidia pedunculata* Beyers in *Bothalia* 32: 79 (2002). Type: South Africa, Western Cape, 3118 (Vanrhynsdorp): Knersvlakte, Olifants River Settlement 316, near Eastern border, (–BC), 6 Aug.

1993, *Le Roux & Hilton-Taylor* 27 (NBG, holo.!: K, PRE, iso.).

***Laiosiphon sericocephalus* (Meisn.) J.C.Manning & Boatwr., comb. nov.** *Arthrosolen sericocephalus* Meisn. in DC., *Prodromus systematis naturalis regni vegetabilis* 14, 2: 561 (1857). *Gnidia sericocephala* (Meisn.) Gilg. ex Engl.: 634 (1921). Type: South Africa, 'In mont. Macalisberg Caffrariae', *Zeyher* 1494 (G-DC, holo.).

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