
A New Species, Notes on Subgeneric Taxa, and New Synonyms in *Hessea* (Amaryllidaceae: Amaryllideae) from South Africa

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ABSTRACT. *Hessea tenuipedicellata*, a new granite-loving species from Namaqualand, shares slender, pliant, upwardly curved pedicels, white flowers, and channeled, narrow, tepals with *H. stenosphon* (Snijman) D. & U. Müller-Doblies. *Hessea* subg. *Hessea* is amplified to include *H. tenuipedicellata* and *H. stenosphon*, and *H.* subg. *Kamiesbergia* (Snijman) Snijman is a new synonym of *H.* subg. *Hessea*. In *H.* subg. *Namaquanula* (D. & U. Müller-Doblies) Snijman, *Namaquanula etesionamibensis* D. & U. Müller-Doblies is a new synonym of *Hessea bruce-bayeri* (D. & U. Müller-Doblies) Snijman.

Hessea Herbert, a genus of small autumn-flowering plants, is endemic to the winter and autumn-rainfall regions of the Nama Karoo, Succulent Karoo, and Fynbos biomes in southern Africa. Cladistic analysis of tribe Amaryllideae using morphological data showed that *Hessea* resolves within subtribe Amaryllidinae in a terminal clade that includes its actinomorphic-flowered allies, *Strumaria* Jacquin and *Carpolyza* Salisbury. The subtribe is recognized by filaments that are connate at the base but are secondarily free in *Carpolyza* and some species of *Strumaria*; by seeds that have chlorophyll in the integument; and by stomata on the testa (Snijman & Linder, 1996). Other representatives of the subtribe that are basal to *Hessea*, *Strumaria*, and *Carpolyza* are *Amaryllis* L., which has unique pink to white seeds, *Nerine* Herbert, *Brunsvigia* Heister, and *Crossyne* Salisbury. *Hessea* sensu Snijman (1994) is divided into three subgenera that share derived floral characters. The perigone in *Hessea* is actinomorphic, and this ultimately turns brown and remains open with age, unlike the perigone that becomes deeply pigmented and finally collapses in all other actinomorphic-flowered Amaryllidinae.

NEW SPECIES

Hessea tenuipedicellata was first collected in leaf on the southernmost boundary of the Namaqualand rocky hills in 1992. The hysteroanthous-leaved bulbs flowered in cultivation one year later and pro-

duced distinctive, delicate, white flowers, which confirmed that the plant was undescribed. Like all representatives of subgenus *Hessea* sensu Snijman (1994), the species has distinctly centrifixed anthers, a condition that results from the sheath in the anther connective having equally long dorsal and ventral walls (Müller-Doblies & Müller-Doblies, 1985). In addition, the plant has basally fused stamens and two foliage leaves surrounded by a sheathing cataphyll: characters that conform with the narrowly defined *Hessea* sensu Müller-Doblies and Müller-Doblies (1985, 1992).

***Hessea tenuipedicellata* Snijman, sp. nov.** TYPE: South Africa. Northern Cape Province: 3018 (Kamiesberg) farm Uilklip, N boundary of Knersvlakte, in pockets of loamy soil on granite domes (DC), 19 Apr. 1994, Snijman 1437 (holotype, NBG; isotypes, MO, PRE). Figure 1.

Species nova *Hesseae stenosphoni* affinis, cujus pedicellos tenues flexibiles sursum curvos, flores albos et tepala angusta canaliculata habet. Differt perigonii tubo brevissimo et filamentis haud bis articulatis.

Delicate, deciduous bulbous herb. *Bulb* solitary, deep seated, subglobose, ca. 15 mm across, covered with brown, cobwebby tunics; producing annually a non-sheathing prophyll, a sheathing cataphyll, a sheathing foliage leaf, and a non-sheathing foliage leaf; neck slender, up to 8 cm long. *Foliage leaves* 2, absent at anthesis, linear, opposite, spreading slightly, up to 16 cm long, ca. 1 mm wide, glabrous. *Inflorescence* umbel-like, lax, 13 cm across; scape slightly curved, rigid, dry, slender, 7.5–13.0 cm long, 1 mm thick, putty-colored, reddened basally; spathe valves 2, linear-lanceolate, 1.5–2.1 cm long, 1.5 mm across proximally, transparent with pinkish veins; bracteoles not visible; pedicels pliant, slender, upwardly curved, 5–10 cm long, ca. 1 mm across, green. *Flowers* 5–12, opening sequentially at 1- to 4-day intervals, suberect to spreading, substellate, up to 15 mm across, glistening white, often with a lemon-green center, sometimes with pale green toward the base of the outer surface, cream

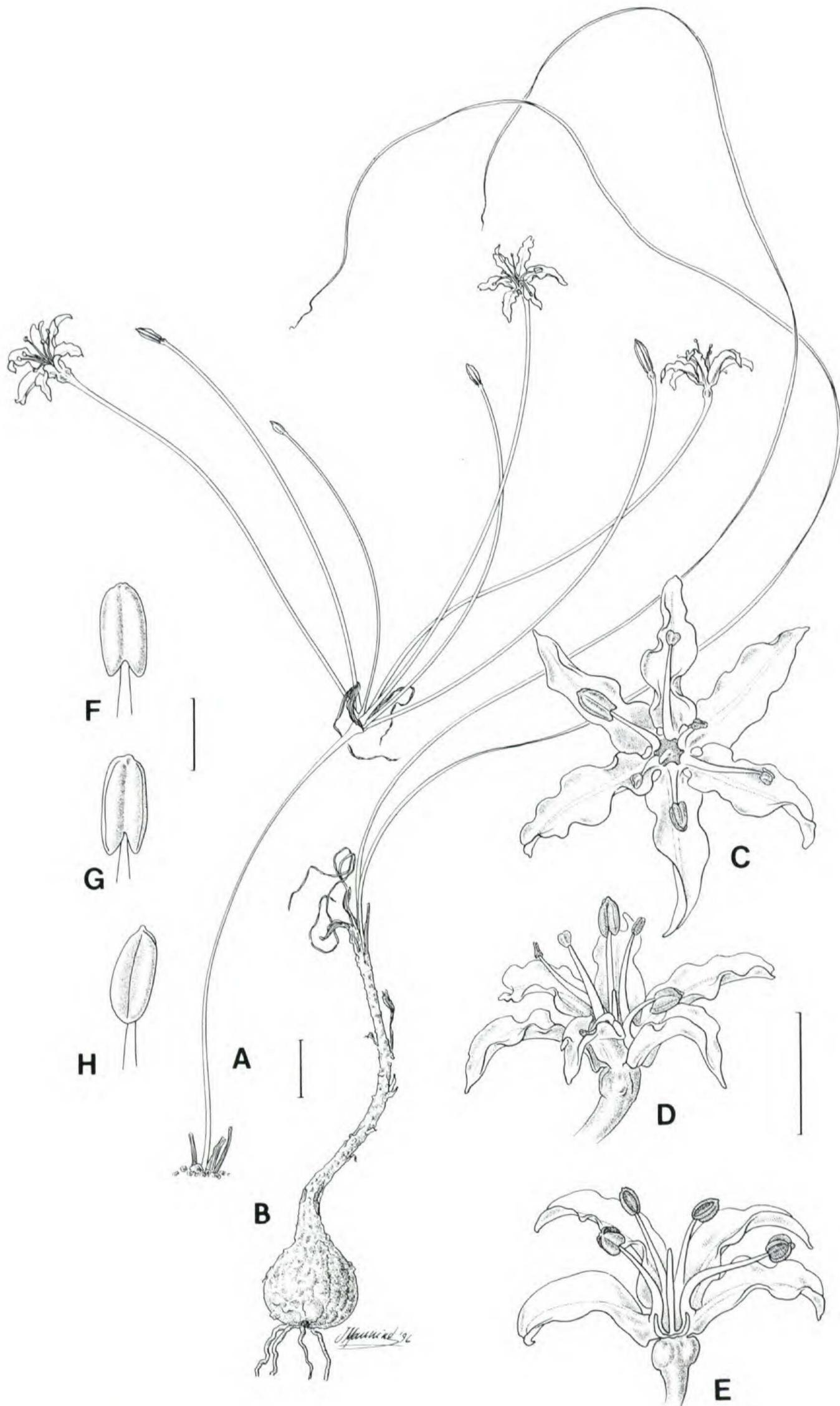


Figure 1. *Hessea tenuipedicellata* Snijman. —A. Inflorescence. —B. Mature leaves and bulb. —C. Flower from above. —D. Flower, lateral view. —E. Flower with two tepals and stamens removed. —F. Anther, dorsal view. —G. Anther, ventral view. —H. Anther, lateral view. Scale bars: A, B = 10 mm; C–E = 5 mm; F–H = 1 mm. Drawn by John C. Manning. Based on Snijman 1437.

to pale lemon in bud, \pm scented, remaining open and turning light brown with age. *Tepals* 6, scarcely connate but adnate to filament tube for ca. 1 mm, recurved in the distal half, 5–9 mm long, 2.5 mm wide, with a thickened midrib in the proximal quarter, channeled, sometimes with strongly undulate edges. *Stamens* 6, 5–6 mm long, slightly shorter than the tepals; filaments connate into a tube 1.5 mm long; anthers centrifixed, 1.5 mm long before dehiscence, wine-red; pollen cream-colored. *Ovary* with 3 ovules per locule. *Style* slender, up to 5 mm long; stigma trifid; nectar centrally pooled around style base. *Fruit* not seen.

Phenology. The main flowering period in the wild is confined to a few weeks between mid-April and early May. The leaves appear shortly after flowering and die back with the onset of the summer drought, usually in September.

Distribution, habitat, and ecology. *Hessea tenuipedicellata* is known from only one locality on the eastern slopes of the Uilklipberg, an isolated granite mountain surrounded by the flat, sandy plains of the northern Knersvlakte in Namaqualand, South Africa. The population of a few hundred plants is confined to pockets of soil on large granite domes. Several patches showed disturbance by porcupines, but the effect on the bulbs could not be gauged. The permanent vegetation cover consists of sparse, succulent perennials, of which the asteraceous stem succulent, *Senecio junceus* Harvey, is most abundant. The closely related *H. stenosphon* (Snijman) D. & U. Müller-Doblies occurs in similar edaphic sites approximately 65 km to the northwest, on exposed granite rocks of the Kamiesberg and its high-lying foothills (Fig. 2). In addition to the geographic distance that separates the species, several important differences in floral structure probably effect ecological isolation. The flowers in *H. tenuipedicellata* are substellate and short-tubed (1 mm long), with widely spreading filaments and a well-exserted style. In contrast, the hypocrateriform flowers of *H. stenosphon* have a style hidden within a narrow, 8–12-mm-long perigone tube, and outer anthers that occlude the perigone throat. Even if these species attract the same insect visitors, it is nevertheless likely that their flowers deposit pollen in places where the stigma of the other species in the pair is unable to contact it.

Most species of *Hessea* have straight, rigid pedicels at anthesis, and flowers that vary from pink to white with dark pink to red markings. In contrast, *H. tenuipedicellata* is easily recognized by its long, slender, pliant, upwardly curved pedicels, and glistening white flowers that lack pink markings.

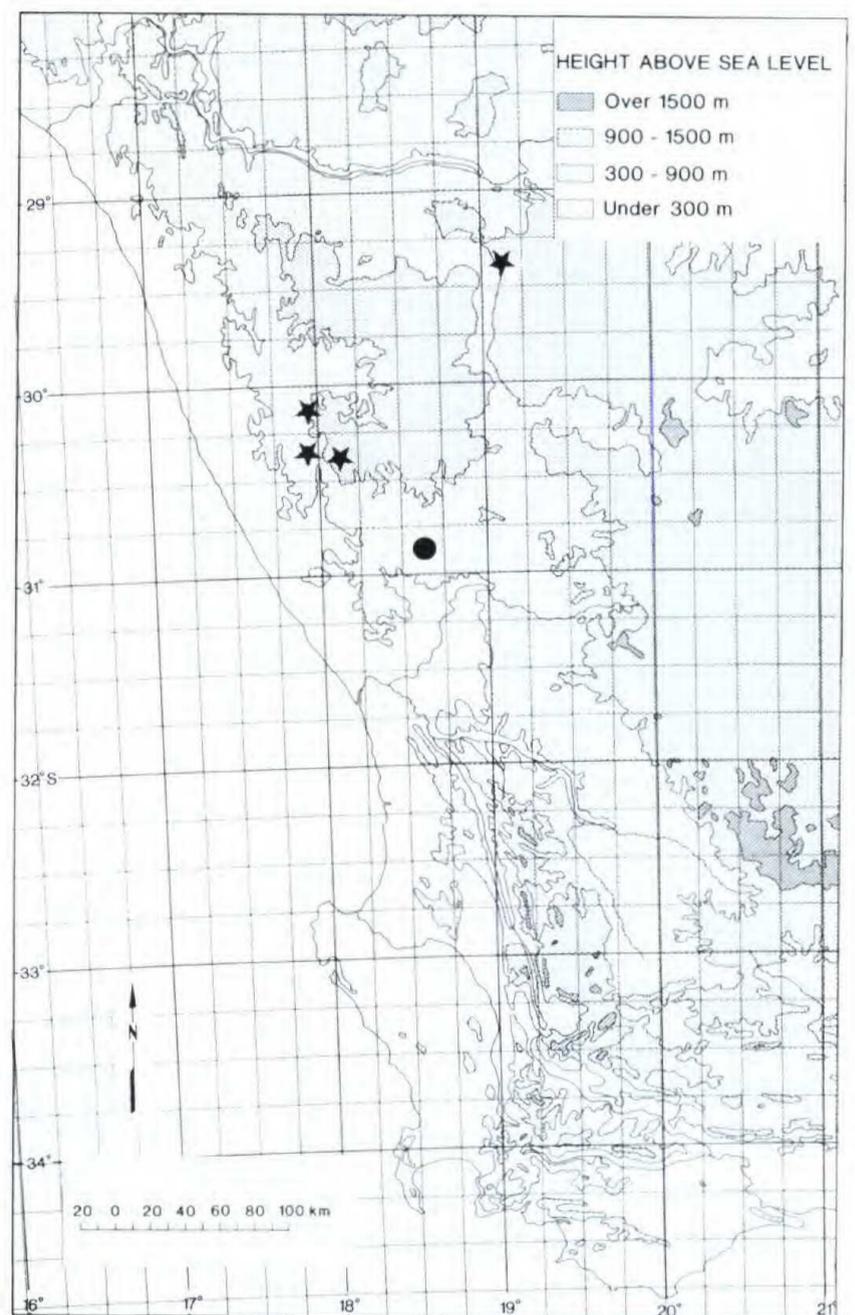


Figure 2. Known distribution of *Hessea tenuipedicellata* (dot) and *H. stenosphon* (star).

Furthermore, the substellate flowers have channeled, narrow tepals, and each flower opens at one- to four-day intervals so that few reach anthesis simultaneously (Fig. 1). The only other known *Hessea* species with similar slender green pedicels, a sequential flowering pattern, and channeled, narrow, whitish tepals is *H. stenosphon*. According to Snijman (1994), this species belongs to the monotypic subgenus *Kamiesbergia* (Snijman) Snijman, which was defined by several unique characters: hypocrateriform flowers; dimorphic stamens; and anthers in which the pocket that encloses the filament tip is extremely short and is located near the base of the connective.

Paratypes. SOUTH AFRICA. **Northern Cape Province:** 3018 (Kamiesberg) farm Uilklip, SW of Kliprand (DC), 16 Aug. 1992, *Bruyns* 5312 (K, NBG, PRE), 6 Apr. 1994, *Snijman* 1422 (NBG).

NEW SYNONYMS

***Hessea* subg. *Hessea*.** TYPE: *Hessea stellaris* (Jacquin) Herbert, typ. cons.

Kamiesbergia Snijman, *Bothalia* 21: 125. 1991. *Hessea*

subg. *Kamiesbergia* (Snijman) Snijman, Contr. Bolus Herb. 16: 71. 1994. Syn. nov. TYPE: *Kamiesbergia stenosphon* Snijman (= *Hessea stenosphon* (Snijman) D. & U. Müller-Doblies).

The morphology of *Hessea tenuipedicellata*, which is intermediate between subgenus *Hessea* and subgenus *Kamiesbergia*, presents evidence additional to that of Müller-Doblies and Müller-Doblies (1992) that two of the three subgenera recognized by Snijman (1994) should be combined. *Hessea* subg. *Hessea* is amplified to include *H. tenuipedicellata* and *H. stenosphon*, and *H.* subg. *Kamiesbergia* is placed into synonymy under subgenus *Hessea*. With this new delimitation, subgenus *Hessea* matches genus *Hessea* sensu Müller-Doblies and Müller-Doblies (1992), except in rank and the number of species recognized in each. The taxon is characterized by derived centrifixed anthers of which the more or less basifixed state in *H. stenosphon* (Snijman, 1994) is inferred to result from a reduction in the length of the sheath in the anther connective (Müller-Doblies & Müller-Doblies, 1992).

Hessea bruce-bayeri (D. & U. Müller-Doblies) Snijman, Contr. Bolus Herb. 16: 75. 1994. *Namaquanula bruce-bayeri* D. & U. Müller-Doblies, Bot. Jahrb. Syst. 107: 20. 1985. TYPE: South Africa. Northern Cape Province: 2816 (Oranjemund) Perdemonde, 1.5 km N of Kuboos/Oranjemund road on road to Koeskop (BC), 10 Mar. 1979, U. & D. Müller-Doblies 79112a (holotype, PRE).

Namaquanula etesionamibensis D. & U. Müller-Doblies, Feddes Rept. 105: 333. 1994. Syn. nov. TYPE: Namibia. 2817 (Violsdrif) Dabimub River, 27 km E of Rosh Pinah waterworks, gravel terraces along Orange River (AA), 8 Aug. 1988, U. & D. Müller-Doblies 88070c (holotype, WIND; putative isotypes, BOL, PRE, STE, not yet deposited, not seen).

With the discovery of *H. tenuipedicellata*, the genus *Hessea* sensu Snijman (1994) is considered to have 14 species. Described from a few collections that flowered poorly in cultivation, *Namaquanula etesionamibensis* D. & U. Müller-Doblies was delimited from *Namaquanula bruce-bayeri* D. & U. Müller-Doblies (= *Hessea bruce-bayeri* (D. & U. Müller-Doblies) Snijman) by small quantitative characters, primarily of the flower: the perigone is 10–12 mm, not 5–8 mm long; the tepals are widely

as opposed to slightly spreading; and trichomes are absent above the hook borne near the base of each filament (Müller-Doblies & Müller-Doblies, 1994). Additional specimens from the alluvial gravel plains along the Orange River, which D. and U. Müller-Doblies did not examine, are florally intermediate between *N. etesionamibensis* and *N. bruce-bayeri*. *Williamson 3405* (Snijman, 1994: fig. 34) in particular has a perigone 5–6 mm long, spreading tepals, and trichomes on and below the filament hooks. To encompass the continuous, clinal variation now evident in the populations located north and south of the Orange River, *Namaquanula etesionamibensis* is placed into synonymy under *H. bruce-bayeri* in *H.* subg. *Namaquanula* sensu Snijman (1994). Thus the perigone of *H. bruce-bayeri* varies from approximately as long as the filaments in specimens from the Aus district, southern Namibia, to half as long as the filaments in those from the Richtersveld, South Africa.

Additional specimens examined. NAMIBIA. 2716 (Witputz), 27°50'S, 16°36'W (DC), 30 Mar. 1986, *Van Berkel 549* (NBG, PRE); 2816 (Oranjemund), 1 mi. N of Orange River at Sendlings Drift (BB), Mar. 1960, *Hall 1901* (NBG). SOUTH AFRICA. **Northern Cape Province:** 2816 (Oranjemund) Perdemonde, E of Arrisdrif (BC), 10 Mar. 1977, *Bayer 350* (NBG); 4 km NE of Beesbank (BC), 10 Mar. 1985, *Williamson 3405* (K, NBG, PRE).

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