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### NYCTAGINACEAE

#### NOTES ON *COMMICARPUS* IN SOUTHERN AFRICA, INCLUDING A NEW RECORD FOR NAMIBIA

*Commicarpus* Standl. is a genus in the Nyctaginaceae with its main distribution range in Africa (Meikle 1978). In southern Africa, nine species occur which are widely distributed in the region, with its centre of diversity in Namibia (Germishuizen & Meyer 2003). No formal taxonomic research has specifically been conducted on *Commicarpus* in southern Africa. Most of the existing knowledge of the group is based on floras from elsewhere in Africa (Baker & Wright 1909; Hutchinson & Dalziel 1927; Meikle 1954; Stannard 1988; Whitehouse 1996).

Anthocarp morphology is considered to provide the most differential characters of the family (Smith 1976; Willson & Spellenberg 1977; Bohlin 1988; Douglas & Manos 2007). An anthocarp consists of a fruit (an achene or utricle) enclosed in a persistent, accrescent, hard, leathery or fleshy base of the calyx tube (Bogle 1974). The anthocarp of the southern African *Commicarpus* species is 5–10 × 2–3 mm, cylindrical, fusiform, clavate or elliptic-clavate with ten obscure ribs and large, dark, mucilaginous, wart-like glands scattered over the surface. The apex is surrounded by ten glands which are either stalked or sessile.

An investigation of the anthocarp morphology of the southern African *Commicarpus* species has revealed numerous misidentifications in southern African herbaria. These misidentifications were probably based on leaf morphology and growth form which do not vary considerably between *Commicarpus* species. Finer morphological differences of the anthocarps facilitate the construction of a key to accurately differentiate between the taxa below genus level.

#### Key to species

- 1a Anthocarp cylindrical with sessile glands around apex . . . . .  
 . . . . . 1. *C. chinensis* subsp. *natalensis*
- 1b Anthocarp fusiform, clavate or elliptic-clavate with stalked  
 and sessile glands around apex:
- 2a Anthocarp elliptic-clavate . . . . . 2. *C. pilosus*
- 2b Anthocarp fusiform or clavate:
- 3a Anthocarp fusiform:
- 4a Ring of five stalked glands alternating with five sessile  
 glands around apex; anthocarp 4–6 mm long . . . . .  
 . . . . . 3. *C. squarrosus* or 4. *C. fruticosus*
- 4b Ring of ten stalked glands around apex; anthocarp 7–9  
 mm long:
- 5a Surface of anthocarp below apex covered sparsely  
 with short-stalked glands (< 1 mm long) grouped  
 together . . . . . 5. *C. plumbagineus*
- 5b Surface of anthocarp below apex covered with scat-  
 tered sessile glands . . . . . 6. *C. fallacissimus*
- 3b Anthocarp clavate:

- 6a Anthocarp broadly clavate; surface covered with pro-  
 nounced glandular hairs; apex surrounded by ten  
 short-stalked glands (< 1 mm) . . . . . 7. *C. decipiens*
- 6b Anthocarp clavate; surface glabrous to puberulent;  
 apex surrounded by five stalked glands alternating  
 with five sessile glands:
- 7a Apex surrounded by five thick-stalked glands, stalks  
 < 1 mm long . . . . . 8. *C. pentandrus*
- 7b Apex surrounded by five thin-stalked glands, stalks  
 1–2 mm long . . . . . 9. *C. helenae* var. *helenae*

The key has facilitated the re-identification of large-fruited *Commicarpus* specimens collected from Namibia. We have identified these specimens as *Commicarpus helenae* (Roem. & Schult.) Meikle var. *helenae*, a variety with a wide distribution from the Middle East into Africa, which also occurs on the islands of the Canaries, Cape Verde and the type locality, St Helena (Meikle 1978). In the *Flora of southern African (FSA)* region, it was hitherto only known from Botswana and the Limpopo Province of South Africa and was not considered to occur in Namibia (Germishuizen & Meyer 2003). In southern Africa, the taxon has been regarded as of limited occurrence, as the circumscription of *Commicarpus helenae* var. *helenae* has generally been misunderstood. Based on anthocarp structure, we can confirm that many southern African specimens of *C. helenae* var. *helenae* have been misidentified and erroneously placed under *C. fallacissimus* (Heimerl) Heimerl ex Oberm., Schweick. & I. Verd., *C. pentandrus* (Burch.) Heimerl, *C. pilosus* (Heimerl) Meikle, *C. plumbagineus* (Cav.) Standl. var. *plumbagineus* and *C. squarrosus* (Heimerl) Standl. Especially the misidentifications as *C. fallacissimus*, *C. pilosus* or *C. squarrosus* can be ascribed to the semisucculent leaves and growth form that these taxa share with *C. helenae* but the anthocarps differ considerably in shape and gland characters (Figure 1). As a result, the distribution patterns of these taxa in the *FSA* region have also been misinterpreted.

We can therefore confirm the presence of *Commicarpus helenae* var. *helenae* in Namibia based on the anthocarp structure of the specimens being most similar to what is generally regarded as typical for the species (Struwig *et al.* 2010). The anthocarp is clavate and tapers markedly from the apex to the base with a ring of five, long, stalked glands around the apex and two rings of sessile glands below. However, a specimen from Khowarib (Struwig 44) in the Kaokoveld, differs from other specimens in that the five stalked glands around the apex are longer (2 mm) than those recorded for other specimens from southern Africa (1 mm) (Figure 2). This taxon is being investigated further.

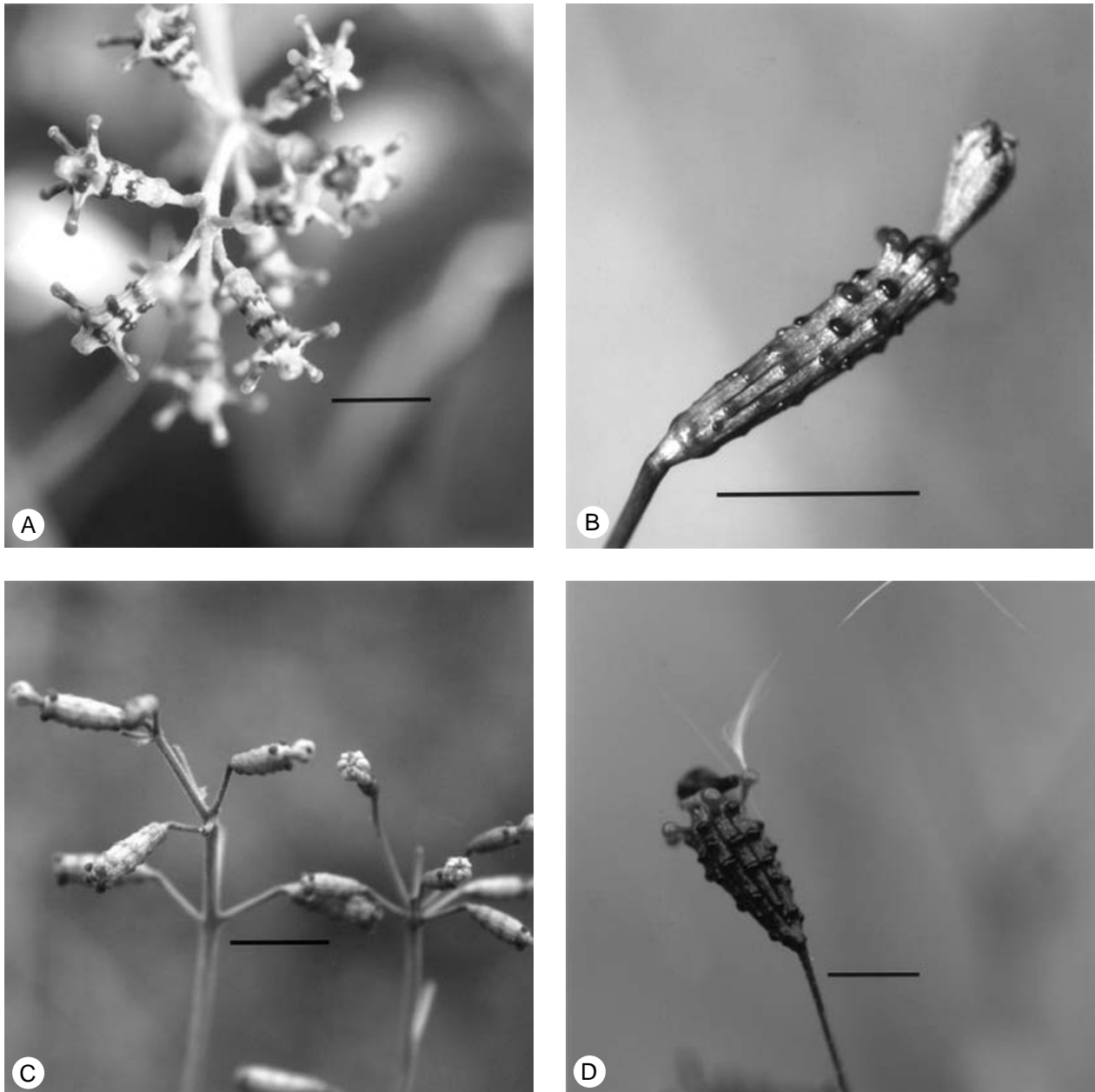


FIGURE 1.—Anthocarps of *Commicarpus*: A, *C. helenae* var. *helenae*; B, *C. fallacissimus*; C, *C. pilosus*; and D, *C. squarrosus*. Scale bars: 5 mm. Photographs: S.J. Siebert.

***Commicarpus helenae* (Roem. & Schult.) Meikle** in Hooker's *Icones Plantarum* 7, 4: t. 3694 (1971). *Boerhavia helenae* Roem. & Schult.: 73 (1822). Type: St Helena, Ladder Hill, *Burchell 1* [K, neo., designated by Whitehouse (1996).—Aluka image, website accessed 08-02-2010].

*Boerhavia stellata* Wight: 6, t. 875 (1843) non *B. stellata* Bojer: 188 (1842) nom. illegit. *C. stellatus* (Wight) Berhaut: 51 (1953). Type: India.

[*C. verticillatus* sensu Baker & Wright: 6 (1909); sensu Hutchinson & Dalziel: 153 (1927); sensu Heimerl: 117 (1934); sensu Balle: 86 t. 7 (1951); sensu Meikle: 1 (1954); non Standl.: 101 (1916)].

***Commicarpus helenae* (Roem. & Schult.) Meikle var. *helenae***

Herb, from a woody rootstock. *Stems* 1.0–1.5 m long, slender, erect, decumbent or scrambling, branching,

pubescent or glabrous. *Leaves* ovate, 15–50 × 10–40 mm, ± fleshy, pubescent to glabrous, apex rounded to acute, apiculate, base cordate, rounded or more or less truncate, slightly attenuate along petiole; margins entire to somewhat repand; petioles 4–22 mm long, sparsely pubescent. *Inflorescence* narrow, verticillate, long-pedunculate, peduncles sparsely pubescent; bracts linear-lanceolate, 1–2 mm long, pubescent. *Flowers* sessile to very shortly pedicellate. *Perianth* 4.0–5.0(–6.5) mm long, lower portion sulcate with 5 prominent viscid glands around apex, upper portion 2.0–3.0(–4.5) mm long, widely infundibuliform with a short (1 mm) inconspicuous tube, pubescent; sepals purple, mauve, magenta, pink, white or yellow. *Stamens* 2 or 3; filaments 4–5(–6) mm long; anthers transverse-elliptic to rounded, 0.3–0.5 mm long. *Ovary* ellipsoid, shortly stipitate, 0.5–0.6 mm long, glabrous; style 3.0–3.5(–5.5) mm long. *Anthocarp* clavate, tapering markedly

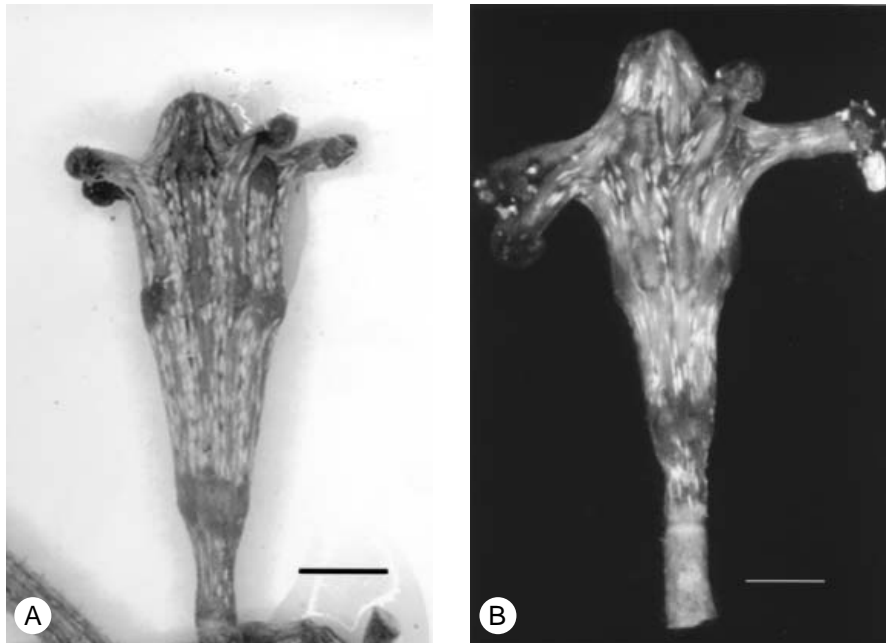


FIGURE 2.—Light microscope micrographs of anthocarps of *Commicarpus helenae* var. *helenae*. A, specimen collected from Kruger National Park, South Africa, *Zambatis* 1954; B, specimen collected from Khowarib, Namibia, *Struwig* 44. Scale bars: 1 mm.

from apex to base,  $3.5\text{--}7.0 \times 1.0\text{--}2.5$  mm, sessile viscid glands in rings, 5 stalked viscid glands, 1–2 mm long, alternating with 5 sessile glands around apex Figures 1A; 2A, B.

*Commicarpus helenae* has two varieties based on characters of a morphological and biogeographical nature. *Commicarpus helenae* (Roem. & Schult.) Meikle var. *barbatus* Meikle differs from the typical variety in having remarkably hairy stems and leaves (Meikle 1979, 1983). Its distribution is restricted to tropical Africa (Klopper *et al.* 2006; African Plant Database 2010). In Africa, the typical variety occurs as far south as N'watinwambu in the Kruger National Park, South Africa (*Maurin & Van der Bank OM348*).

**Distribution and habitat:** previously only 11 localities of *Commicarpus helenae* var. *helenae* were known for southern Africa, but our redeterminations have increased this figure to 25, suggesting that the taxon is much more

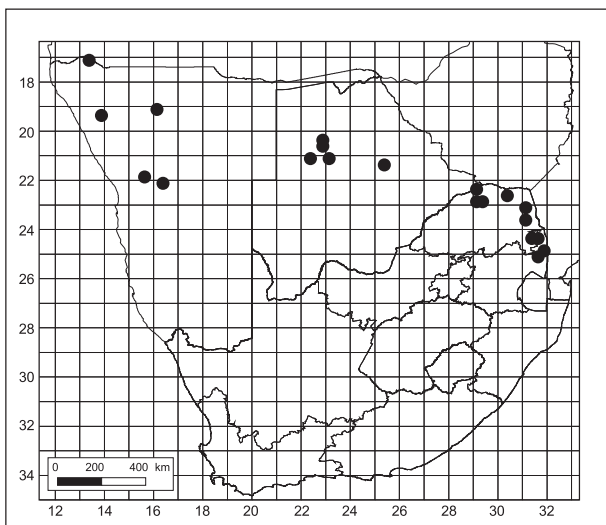


FIGURE 3.—Distribution of *Commicarpus helenae* var. *helenae* in southern Africa.

part of the southern African flora than was previously thought (Figure 3). It has been recorded from similar habitat types in Namibia and South Africa. Labels generally describe the habitat as rocky, in sandy, loamy or alluvial soil in calcrete or sandstone areas.

#### Specimens examined

**NAMIBIA.**—1713 (Swartbooisdrif): Omitengundi, 500 m north of road junction, (–AB), 09-04-1998, *Schulte 108530* (WIND). 1913 (Sesfontein): Khowarib Rest Camp, underneath *Acacia* and Mopani trees, (–BD), 09-02-2009, *Struwig 44* (PUC, WIND). 1916 (Gobaub): Etosha National Park, Charitsaubplain, near pan with *Acacia reficiens*, (–AA), 18-04-1973, *Le Roux 520* (WIND, PRE). 2115 (Karibib): Spitzkoppe, (–DC), 03-03-1985, *Craven 2022* (WIND). 2216 (Otjimbingwe): Okomitundu Farm, underneath *Acacia* trees in front of gate to house, (–AB), 12-04-2010, *Struwig 183* (PUC, WIND).

**BOTSWANA.**—2022 (Lake Ngami): Lake Ngami, Mwaku Pan near Sehitwa, slopes around Mwaku Pan, (–BD), 12-1969, *Van der Spuy 30* (PRE, UCBG); north of Ngwanalekau Hills, open areas (often termitaria) in *Terminalia prunioides* woodland, (–DB), 14-03-1969, *Burger 1149* (PRE, UCBG). 2122 (Kobe): ± 10 km past Kuke Village on road to Maun, (–AB), 06-03-1996, *Burgoyne & Snow 5283* (PRE, UCBG). 2123 (Pink Pan): central Kalahari, (–AA), 02-02-1991, *Barnard 586* (PRE, UCBG). 2125 (Lothlekane): Orapa, (–AD), 16-03-1975, *Kerfoot 7748* (PRE, UCBG).

**LIMPOPO.**—2229 (Waterpoort): Breslau Game Farm, base of koppie, (–AC), 05-05-2000, *Straub s.n.* (PUC); Breslau Game Farm, (–AC), 30-05-2000, *Straub 831* (PRE); Langjan Nature Reserve, (–CC), 12-1974, *Zwanziger 496* (PRE); Soutpan 193, thinly scattered in outer circle of salt pan, (–CD), 19-11-1932, *Obermeyer, Schweickerdt & Verdoorn 19* (PRE); Soutpan, west side of pan, (–CD), 21-01-1931, *Bremekamp & Schweickerdt 249* (PRE, PRU). 2230 (Messina): Tshipiza work station (Greater Kudu Land Safaris), (–CB), 06-12-1984, *Van Wyk 6887* (PRE, PRU). 2331 (Phalaborwa): 50 m west of Shingwedzi River, over cement drift on bank, (–AA), 11-03-2010, *Struwig 141* (KNP, PUC); 150 m west of cement drift over Shingwedzi River, upstream of Red Rocks, (–AA), 14-01-1994, *Zambatis 1954* (KNP, PRE); Letaba River, western border Mhlangene, (–CA), 01-12-1992, *Van Rooyen & Bredenkamp 582* (PRU). 2431 (Acornhoek): Kingfisherspruit, Timbavati, (–AD), 21-12-1962, *Biologiese Afdeling 4592* (KNP, PRE); Klaserie Nature Reserve, Farm Ross 55KU, (–AD), 16-12-1981, *Zambatis 1306* (PRE); Timbavati Private Nature Reserve, Hans Hoheisen Wildlife Reserve Station, Kempiana 90KU, (–AD), 18-12-1982, *Zambatis 1526* (PRE); Kruger National Park, Acornhoek, in grassland, (–BC), 03-1975, *Gertenbach 5042* (PRE).

**MPUMALANGA.**—2431 (Acornhoek): Kruger National Park, Nkuhlu Partial Exclosure, Sabie River, (–DD), 08-12-2010, *Van Coller*,

Siebert & Siebert, 4339 (PUC), 2531 (Komatipoort): N'watinwambu firebreak about 1 km from S114 road, (–BA), 05-12-2005, *Maurin & Van der Bank OM348* (KNP).

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## AIZOACEAE

### NEW COMBINATIONS IN *ANTIMIMA* AND *OCTOPOMA* (RUSCHIOIDEAE)

#### 1. A new combination in *Antimima* for *Ruschia paripetala* (L.Bolus) L.Bolus

*Antimima* is a large and still unrevised genus of ± 100 species (Dehn 1989; Hartmann 1998b). Many species, most of which were described by L.Bolus, were not compared with similar species, making it unclear to which species they were most similar.

Features by which species of *Antimima* may be recognized include 5(or 6)-locular fruits with large closing bodies and shallow locules, heterophyllous leaves, and 1(–3)-flowered inflorescences (rarely aggregated in well-developed cymes) (Dehn 1989; Hartmann 1998b).

In addition, the leaves in species of *Antimima* often have a papillate epidermal surface, whereas they are typically smooth in *Ruschia*. Notably, 6-locular fruits are rare in both *Ruschia* and *Antimima*.

A six-locular species of *Ruschia* from Namaqualand, *R. hexamera* L.Bolus, was recently found to be conspecific with *Antimima crassifolia* (L.Bolus) H.E.K.Hartmann and to represent the earlier name for the taxon (Klak 2010). A further collection by Pillans from Wallekraal near Hondeklip Bay in Namaqualand, described as *R. paripetala* by L.Bolus in 1927, is also very similar to *A. hexamera* (L.Bolus) Klak. The type specimens of both *A. hexamera* and *R. paripetala* pos-