

RUBIACEAE

A NEW SPECIES OF *DIDYMOSALPINX* AND A NEW SPECIES OF *OXYANTHUS* FROM MOZAMBIQUE AND TANZANIA

Recent research into the flora of northeastern Mozambique has brought to light, from the Palma District of Cabo Delgado Province, two taxa of Rubiaceae which have yet to be described. Both these taxa have previously been recorded from the southeastern region of Tanzania but have only been known from a few specimens which lack either fruit or flower and have, therefore, remained un-named. Now that fruiting and flowering material of both these taxa has been collected from Mozambique, they are fully described below.

Didymosalpinx callianthus *J.E. Burrows & S.M. Burrows*, sp. nov., *D. norae* (Swynn.) Keay similis sed fruticex parvae usque ad 1 m altus, spinis nullis, lobis calycis maioribus 10–17 mm longis, floribus maioribus tubo corollae 75–85 mm longo differt.

TYPE.—Mozambique: Cabo Delgado Province, Palma District, 1.9 km from turnoff to Nhica do Rovuma on Palma-Pundanhar road, 10° 50' 55"S, 40° 12' 44"E, 140 m, 6 December 2008, *J.E. Burrows & S.M. Burrows 10998* (BNRH, holo.; K, LMA, PRE, iso.).

Didymosalpinx sp. A. Bridson & Verdcourt (1988: 526).

Woody, evergreen, glabrous shrub or treelet, 0.5–1 m tall, with 1–3 stems. *Branches* ± horizontal, spines absent. *Leaves* opposite, evenly spaced along branchlets, elliptic to broadly elliptic or oblanceolate, 65–130 × 25–50 mm, apex acuminate to apiculate, terminating in a fine mucro, base cuneate to broadly cuneate; margin entire, faintly rolled under, drying olivaceous, texture thinly coriaceous, shiny above, glabrous throughout, domatia absent or a few (1 or 2 per leaf) scattered in axils of stronger lateral veins, small, set with short, silky hairs; stipules 4–6 × 3.0–3.5 mm, limb broadly triangular with a narrow acumen 3–4 mm long, inner surface glabrous. *Flowers* pendulous, paired or single, arising 5–10 mm above leaf node; pedicel 20–28 mm long, glabrous. *Calyx*: limb broadly obconic, 2 mm long; lobes subulate, 10–17 × 2–3 mm, with a distinct midvein, glabrous within or with a few minute hairs. *Corolla* creamy white, tube obconical-campanulate, 75–85 mm long, distinctly 10-ribbed, lobes contorted to left in bud, spreading, broadly oblong-ovate, ± 20 mm long. *Stamens*: anthers sessile, attached to tube, ± 15 mm long. *Stigma*: style 50–60 mm long; pollen presenter narrowly ellipsoid to somewhat clavate, 25 × 4 mm, extending as far as mouth of tube, or just within mouth, not exerted. *Fruit* ellipsoid, 25 × 15 mm (dried), yellowish green, glabrous, strongly 5-ribbed, crowned with persistent calyx lobes ± 4 mm long. *Seeds* 6–8 per fruit, slightly flattened, 7–9 × 6–8 mm, pale cream-coloured, somewhat rugose. Figures 24, 25.

Distribution: confined to the southeastern corner of Tanzania and the extreme northeastern region of Mozambique. Figure 26.

This taxon was first collected by H.-J. Schlieben in January 1935 near Lake Lutamba in the Lindi District of southeastern Tanzania and initially identified at Berlin (B) as *Gardenia zanguibarica*. In 1959 Petit annotated the sheet at Kew as 'cf. *Didymosalpinx*'. In 1973, while preparing the account of the genus for the Rubiaceae part of *Flora of tropical East Africa*, Verdcourt recognised that this collection did not match *D. norae* (Table 4) and annotated the Kew sheet as *Didymosalpinx* sp. A. Since it was then only known from this single collection, and the Kew specimen bore only one flower, Bridson & Verdcourt (1988) treated this taxon without a specific epithet.

Habitat and ecology: the habitat of *Didymosalpinx callianthus* in Tanzania is unrecorded but in Mozambique it is only found in the deeply shaded understorey of small patches of semi-deciduous forest centred on old termitaria. These forest patches are locally abundant within a matrix of semi-deciduous woodland dominated by *Berlinia orientalis* (Caesalpinaceae), *Uapaca nitida* var. *nitida* (Euphorbiaceae) and *Parinari curatellifolia* (Chrysobalanaceae), occurring on sandy coastal soils ± 50 km from the sea and at ± 140 m a.s.l. Rainfall experienced at the Mozambique locality is about 1 100 mm per annum, received mostly from December to May. Flowering appears to occur from late November to January.

Didymosalpinx callianthus was seen in three of these forest patches, all deeply shaded and none exceeding a metre in height. Of particular interest is the abundance of the family Rubiaceae in the understorey of these small patches of forests. Apart from the *Didymosalpinx*, the authors also collected in these forest patches *Chasalia* sp. D. (cf. *C. umbraticola*), *Chazaliella abrupta* var. *abrupta*, *Coffea schliebenii*, *Coptosperma supra-axillare*, *CreMASpora triflora* subsp. *confluens*, *Gardenia transvenulosa*, *Ixora* sp., *Leptactina delagoensis*, *Oxyanthus latifolius*, *O. biflorus*, *Psychotria* sp. cf. *capensis*, *Psydrax micans*, *Triainolepis africana* subsp. *hildebrandtii*, *Tricalysia coriacea* subsp. *nyassae* and *T. semidecidua*.

Conservation status: a range-restricted species (extent of occurrence: 2 400 km², area of occupancy: 300 km²), known to occur at present at only two locations where they are both threatened by habitat loss due to rural development and, in the Mozambique location, by possible drilling of oil wells. None of the subpopulations

TABLE 4.—Comparison of characters between *Didymosalpinx norae* and *D. callianthus*

Character	<i>D. norae</i>	<i>D. callianthus</i>
Habit	Tree 3–8 m tall, sometimes scandent	Shrub or treelet 0.5–1 m tall
Spines	Usually present	Absent
Calyx lobe (mm)	3–6 × 1.0–1.5	10–17 × 2–3
Corolla tube length	37–60 mm	75–85 mm
Altitude (m)	± 700–± 1 500	140–240



FIGURE 25.—*Didymosalpinx callianthus* in habitat, Nhica da Rovuma, Palma District, Mozambique. Photographer: John Burrows.

occur within a protected area. We therefore recommend a status of EN B1ab(iii)+2ab (iii) (IUCN 2001).

Specimens examined

TANZANIA.—1039: Lindi District, Lutamba-See (Lake Lutamba), 240 m, fl. 10 January 1935, *Schlieben 5852* (B [†?], K!).

MOZAMBIQUE.—1040: Cabo Delgado Province, Palma District, 1.9 km from turnoff to Nhica do Rovuma on Palma-Pundanhar road, 10° 50' 55"S, 40° 12' 44"E, 140 m, fl. 6 December 2008, *J.E. Burrows & S.M. Burrows 10998* (BNRH, holo.; K, LMA, P, PRE, PRU, iso.); *ibid.*, fr. 22 March 2009, *J.E. Burrows & S.M. Burrows 11285* (BNRH, K, LMA, PRE).

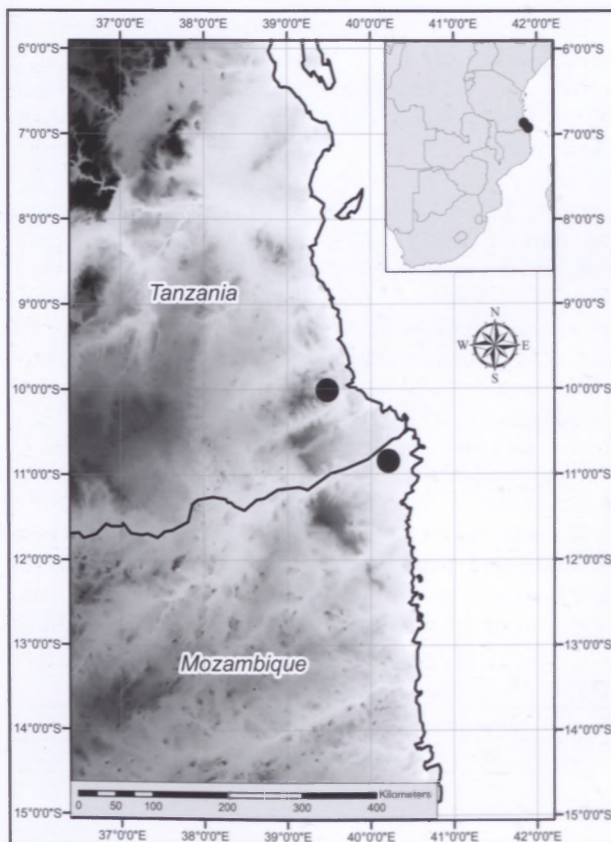


FIGURE 26.—Known distribution of *Didymosalpinx callianthus*.

Oxyanthus biflorus *J.E. Burrows & S.M. Burrows*, sp. nov., *O. zanguebarico* (Hiern) Bridson similis sed floribus solitariis vel binatis, lobis calycis parvis triangularibus 0.5 mm longis, antheris omnino inclusis, lobis corollae valde asymmetricis usque ad 40 × 11 mm, fructu anguste fusiformi 10–12 mm lato differt.

TYPE.—Mozambique, Cabo Delgado Province, Palma District, 1.9 km towards Palma from turnoff to Nhica do Rovuma on Palma-Pundanhar road, 10° 50' 55"S, 40° 12' 43"E, 140 m, 22 March 2009, *J.E. Burrows & S.M. Burrows 11286* (BNRH, holo.; K, LMA, PRE, PRU, iso.).

Evergreen shrub or treelet, 0.5–2.5 m tall, frequently suckering from base. *Bark* grey-brown, smoothish, faintly longitudinally ridged. *Branches* decussate. *Leaves* opposite, evenly spaced along branchlets, elliptic, 50–85 × 17–42 mm, apex acuminate, terminating in a fine mucro, base cuneate, slightly asymmetrical; surface shiny above, texture thinly coriaceous, domatia few, scattered, rather indistinct, set with a few sparse, stiff hairs; margin entire, flat; stipules subulate-lanceolate, 8–12 × 2.5 mm, glabrous on both surfaces. *Flowers* held ± erect from ± horizontal branchlets, borne alternately in axils at successive nodes, in pairs from short, common peduncle; peduncle subsessile, up to 2 mm long, partly obscured by stipules; inflorescence branches absent; pedicel 9–20 mm long, glabrous; bracteole borne at articulation between peduncle and pedicel, linear-subulate, 1–2 mm long, caducous. *Calyx* limb cupuliform, 2 mm long, subtruncate with 5 small short triangular teeth 0.5 mm long, glabrous. *Corolla* white, fragrant, tube straight, 100–115 × 2.0–2.5 mm, throat with scattered hairs extending 8 mm down inside tube; lobes 5, contorted to the left in bud, lanceolate asymmetric-dimidiate, up to 40 × 11 mm, spreading to reflexed. *Anthers* mostly included in throat, 5 mm long, sessile, dorsifixed almost at base, apex with a 1 mm long sterile, flattened apical point which just protrudes beyond throat at anthesis; pollen shed at time of flower opening when pollen presenter is still fully included within tube; stigma clavate, 2-lobed, eventually exerted by 3 mm. *Ovary* inferior, 7 mm long at anthesis, 2-locular, placentation axile.

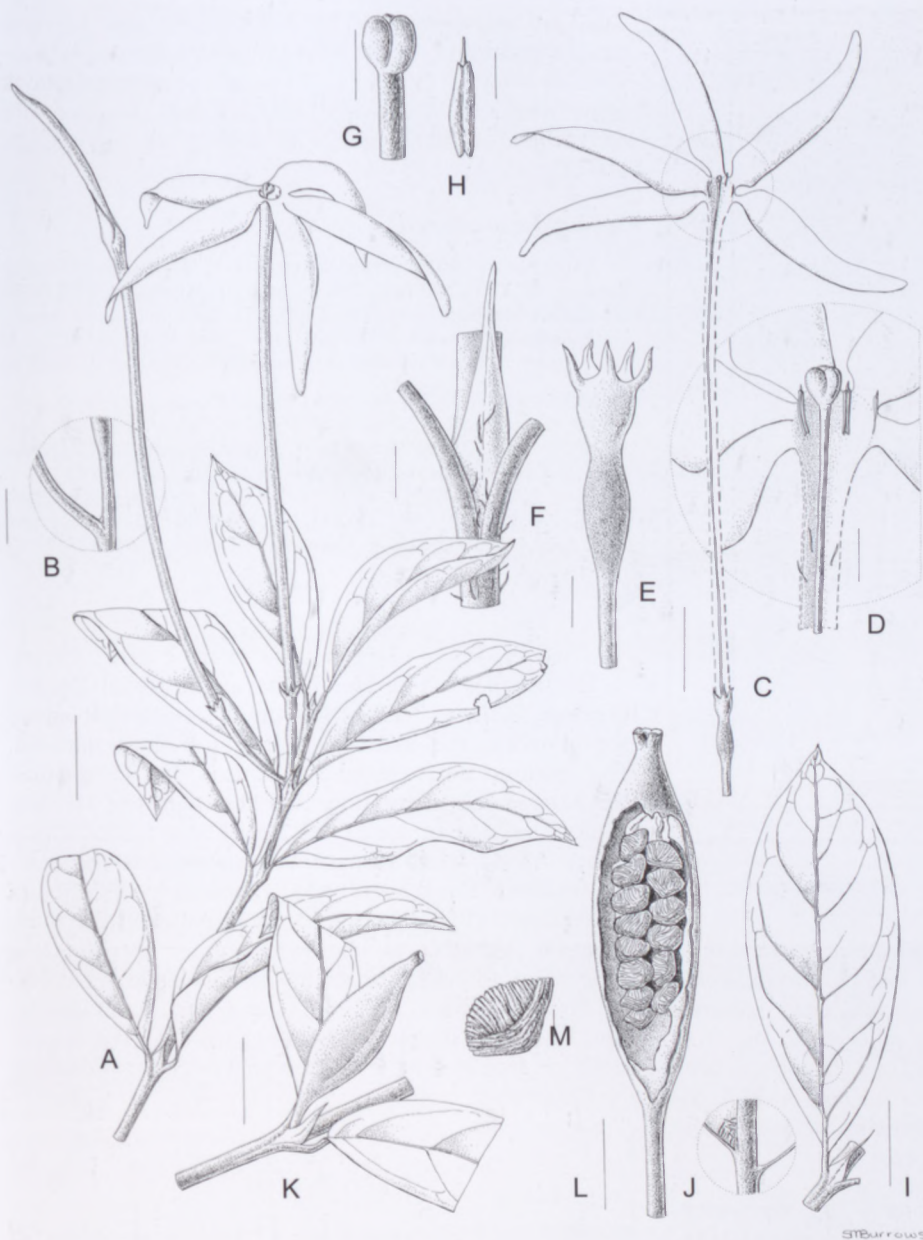


FIGURE 27.—*Oxyanthus biflorus*, Burrows & Burrows 11286. A, flowering branch; B, peduncle and pedicel base; C, flower with tube cut away; D, flower throat with anthers; E, calyx tube; F, stipule; G, stigma; H, anther; I, leaf; J, domatium; K, fruit; L, fruit with seed exposed; M, seed. Scale bars: A, C, I, K, 20 mm; L, 10 mm; B, D, 5 mm; E–H, 2 mm; M, 1 mm. Artist: Sandra Burrows.

Fruit narrowly ellipsoid-fusiform, 40–45 × 10–12 mm, glabrous, smooth or very faintly ribbed, yellowish green when ripe, crowned with the persistent ± truncate calyx. Seeds 3.0–3.5 mm diam., arranged in 4 rows of ± 8 seeds per row, brown, densely ridged, resembling a ball of string. Figure 27.

Distribution: coastal southeastern Tanzania and the Palma area of Cabo Delgado Province in Mozambique. Figure 28.

Although Clarke collected material of this taxon in bud in 1995, it was not until 2009 that a fully-opened flower of *Oxyanthus biflorus* was seen. Up until 2008

the taxon was not known to occur in Mozambique but it is not surprising that another species, previously thought to be confined to the Lindi Centre of Endemism (Clarke 2001), has now been recorded in the adjacent Cabo Delgado Province of Mozambique. *Oxyanthus biflorus* may be conspecific with *O. sp. A.* of *Flora of tropical East Africa*. *Oxyanthus biflorus* is most closely related to *O. zanguebaricus* (Table 5).

Bridson (2003: 687) states that *Oxyanthus querimbensis* Klotzsch, which she regards as an imperfectly known species, and the type of which has been destroyed in Berlin, could be conspecific with *O. zanguebaricus*. Now that *O. biflorus* has been described

TABLE 5.—Comparison of characters between *Oxyanthus zanguebaricus* and *O. biflorus*

Character	<i>O. zanguebaricus</i>	<i>O. biflorus</i>
Flowers per inflorescence	(3)–5–11	1 or 2
Calyx lobe shape and length	linear-subulate, (4)–5–8 mm	triangular, 0.5 mm
Corolla lobe (mm)	even, 10–22 × 3–5	asymmetric, up to 40 × 11
Fruit shape and width	pyriform, 24–32 mm	fusiform, 10–12 mm

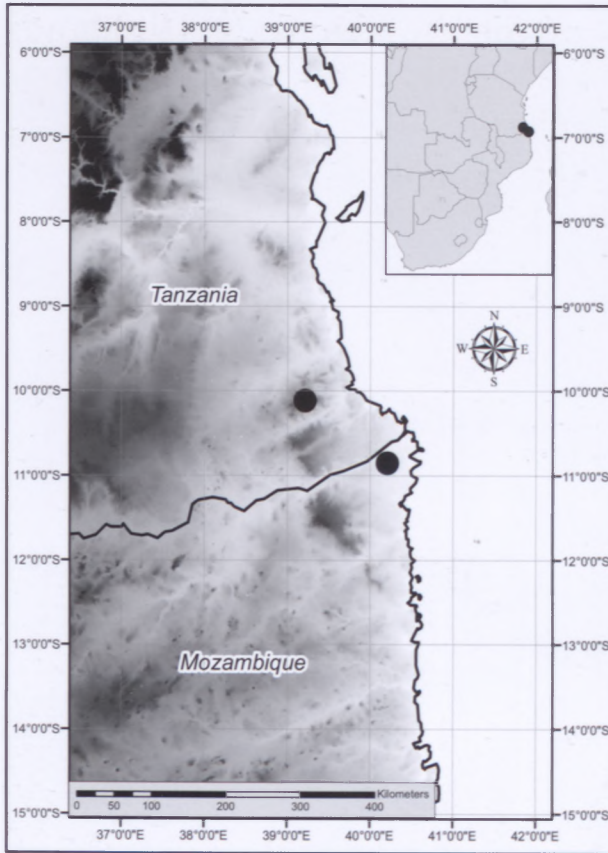


FIGURE 28.—Known distribution of *Oxyanthus biflorus*.

from the same general area of northern Mozambique, it too could be considered as the lost *O. querimbensis*. However, since *O. zanguebaricus* has been recorded from the coastal belt immediately adjacent to the Querimba Islands, and since *O. biflorus* has only been recorded from the slightly higher plateau woodlands further inland, *O. zanguebaricus* remains the most likely contender for the lost *O. querimbensis*.

Habitat and ecology: in seasonally dry, semi-evergreen forest with *Milicia excelsa*, *Dialium holtzii*, *Albizia* sp., *Pteleopsis myrtifolia*, *Uapaca nitida*, *Hymenaea verrucosa* and *Berlinia orientalis*. The plants grow in moderate to deep shade of forest and bush clumps, on sandy soils. Altitude ranges from near sea level to 850 m. Average rainfall recorded in its area of occurrence is 900–1 100 mm per annum, falling mostly from December to May. Flowering appears to take place from mid-December to the end of February.

Conservation status: a range-restricted species (extent of occurrence: 3 200 km², area of occupancy: 700 km²), known to occur at present at only five locations where

they are all threatened by habitat loss due to rural development and, in the Mozambique location, by possible drilling of oil wells. None of the subpopulations occur within an effectively protected area. We therefore recommend a status of EN B1ab(iii)+2ab (iii) (IUCN 2001).

Specimens examined

TANZANIA.—1039: Lindi District, Rondo Plateau, Rondo Forest Reserve, 10° 07'S, 39° 13'E, 750 m, imm. fr. 3 February 1991, *Bidgood, Abdallah & Vollesen 1341* (DSM, K!); *ibid.*, imm. fl. 6 February 1991, *Bidgood, Abdallah & Vollesen 1364* (DSM, K!); Rondo Plateau, 10° 07'S, 39° 12'E, 850 m, imm. fr. 16 June 1995, *Clarke 29* (DSM, K!).

MOZAMBIQUE.—1040: Cabo Delgado Province, Palma District, 1.9 km from turnoff to Nhica do Rovuma on Palma-Pundanhar road, 10° 50' 55"S, 40° 12' 43"E, 128 m, fl. & fr. 22 March 2009, *J.E. Burrows & S.M. Burrows 11286* (BNRH, holo.; K, LMA, PRE, PRU); *ibid.*, 10° 50' 55"S, 40° 12' 44"E, 140 m, imm. fl. 6 December 2008, *Burrows & Burrows 11016* (BNRH, K, LMA); *ibid.*, fl. 10 December 2008, *Müller 4125* (BNRH, K, LMA, P).

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