

NEW RECORDS AND DISTRIBUTIONAL DISJUNCTIONS FROM SOUTH AFRICA, ZIMBABWE AND MOZAMBIQUE

INTRODUCTION

Floristic evidence for the continuity of vegetation types often lingers in the form of relicts which inhabit isolated refugia. This evidence can be ambiguous in families with adaptations to long distance dispersal. However, in a number of families, vicariance is the only logical explanation for distributional anomalies. This paper records disjunctions in Acanthaceae, Thymelaeaceae and Lamiaceae, all families renowned for the parochial dispersal of seeds and fruits.

ACANTHACEAE

Recent research (Edwards & Harrison 1998) revealed a distributional extension to the range of *Pseuderanthemum hildebrandtii* Lindau (Acanthaceae) which reiterates the floristic links between tropical East Africa and northern KwaZulu-Natal. This species is associated with woodlands and provides compelling evidence of the continuity of dense savanna and forest habitat between the eastern seaboard of South Africa and populations in Tanzania. Acanthaceae have explosive fruits with elastic

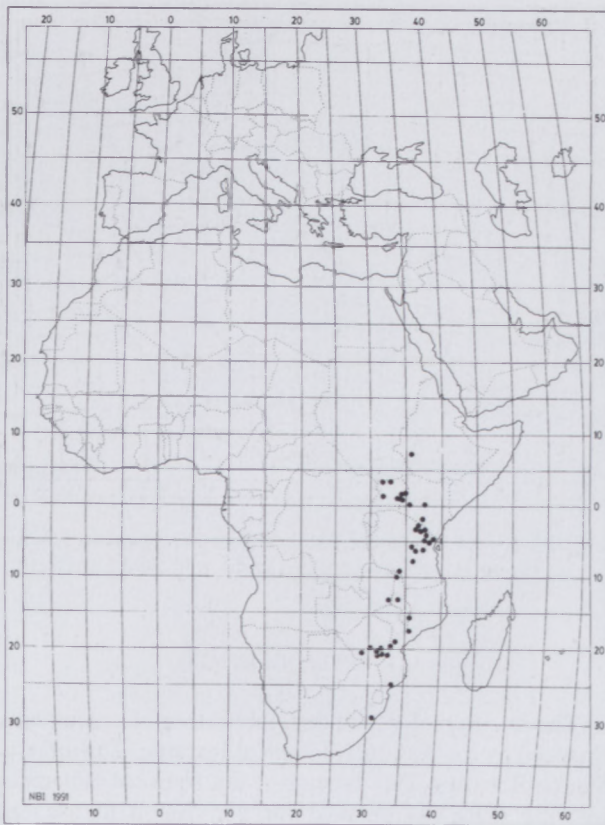


FIGURE 9.—Recorded distribution of *Metarungia pubinervia*.

funicles (retinaculæ) which are effective in local dispersal but are not suitable for long distance dispersal. It was therefore exciting to find another species of forest Acanthaceae, *Metarungia pubinervia*, which corroborates the above pattern.

According to Baden (1981) the genus *Metarungia* comprises three species, two of which, *M. galpinii* (Baden) Baden and *M. longistrobus* (C.B. Clarke) Baden, are endemic to the subcontinent and the type species, *M. pubinervia* (T. Anderson) Baden, is common in tropical East Africa, but has been recorded in southern Mozambique. The phytogeography of *Metarungia* is intriguing in its inconsistency. *M. longistrobus* occurs in association with forest patches in Mpumalanga, southwest Mozambique and Swaziland and, although the species occasionally ventures into stony grasslands with steep slopes, it is unable to survive fire. Similarly, *M. galpinii* is limited to forest habitats around East London, Eastern Cape, but in cultivation both species are more vigorous in exposed situations. There is no doubt that *M. galpinii* and *M. longistrobus* are sister species, the plants have very similar habit, creamy mustard corollas of similar size, similar androecia, gynoecia, inflorescence structure, fruits and seeds. The major differences which separate them relate to indumental differences, bract size, the loss of bracteoles in *M. galpinii*, and the much smaller calyces of *M. longistrobus*. If one accepts that these are vicarious sister species, then their current parochial distributions (Baden 1981) are remnants of the range of their hypothetical parent. This distributional disjunction provides compelling evidence of an ancient forest link between the afro-montane and riverine forests of Mpumalanga, in the north, and the coastal forests

around East London. Neither species has yet been recorded from the intervening forests of KwaZulu-Natal. Extending this line of reasoning to *M. pubinervia* (Figure 9), allows one to postulate past forest linkage between the southern (Krantzkloof) and northern (Tanzanian) populations.

***Metarungia pubinervia* (T. Anderson) Baden** in Kew Bulletin 39: 638 (1984). *Macrorungia pubinervia* (T. Anderson) C.B. Clarke: 255 (1900); Brenan & Greenway: 13 (1949); Dale & Greenway: 17 (1961); Agnew: 607 (1974); Baden: 148 (1981). *Rungia pubinervia* T. Anderson: 46 (1863). *Himantochilus pubinervia* (T. Anderson) Lindau: 373 (1895a). *Anisotes pubinervis* (T. Anderson) Heine: 189 (1966). Type: Malawi, Mt Chiradzulu, Kirk s.n. (K!, lecto.).

Himantochilus marginatus Lindau: 60 (1894); Lindau: 346 (1895b). Type: Tanzania, Usambara. Holst 9063 (HBG, lecto.; G, P, M, Z, W).

Shrubs 1–5 m tall; stems initially hairy, often with aerial roots. Leaves elliptic to narrowly obovate, 140–250 × 40–100 mm, sparsely strigose to glabrescent, apex acute to acuminate, veins sericeous when young, becoming glabrescent, acarodomatia present in vein axes; petiole 15–60 mm long. Inflorescences axillary, usually on leafless stems, 15–50 mm long; peduncles seldom exceeding 2 mm long, glabrescent; bracts tightly imbricate; lower bracts sterile, ovate to elliptic, 5–12 × 3–5 mm, apex slightly acuminate, margin slightly scarious; fertile bracts broadly ovate, 10–15 × 6–9 mm, apex acuminate, margin markedly scarious, pink to red; bracteoles absent. Calyx 9–12 mm long, membranous; lobes pink, 7–9 × 2–3 mm, midveins green, extending into an apiculus. Corolla cylindrical, red; tube 9–11 mm; upper lip 28–31 × 8 mm, cucullate; lower lip coiled at anthesis, 20 × 3 mm. Stamens 2; filaments 20 mm long, cream-coloured, epipetalous, attached in throat; anther thecae oblique, 2–3 mm long. Ovary 2.5–3.0 × 1.5 mm, glabrescent; style 27–30 mm long, glabrous; nectariferous cupule 1–2 mm tall.

In the Krantzkloof population bracteoles were not observed. However, Baden (1981) records the occasional occurrence of linear bracteoles in tropical populations of *M. pubinervia*. In a generic context, the fugitive occurrence of bracteoles in this species is interesting because this character is used to discriminate between *M. longistrobus* and *M. galpinii*.

Throughout its range *M. pubinervia* occurs between 500 and 2 000 m in riverine and evergreen forest, in light shade. The Krantzkloof population is limited to scree along the base of sandstone cliffs. This unstable substrate reduces the establishment of the tree canopy and maintains the higher light intensities in which the species thrives. This population is fairly large (several hundred adult individuals and an abundance of seedlings) and the plants, although conspicuous, are in a fairly remote section of the gorge and have consequently escaped detection.

Specimen examined

KWAZULU-NATAL.—2930 (Pietermaritzburg): Krantzkloof Nature Reserve, (–DD), Styles, Johnson & Edwards s.n. (K, NH, NU, PRE).

THYMELAEACEAE

The poor capacity for long distance dispersal is common to a number of families, including Thymelaeaceae. Most South African species of *Gnidia* are grassland inhabitants and, due to the continuity of this habitat, relatively few species display disjunct distributions. *Gnidia denudata* is anomalous in this regard. The species has a tree-like habit and occurs in forest margins, lacking the resprouting caudex which enables grassland taxa to survive fire. The remaining *Gnidia* species are shorter, multi-stemmed shrubs or herbs inhabiting fynbos, grassland or subalpine zones. Lindley (1823) described *G. denudata*, the specific epithet referring to the lack of lamina hairs, which usually distinguishes this species from *G. imbricata* L.

***Gnidia denudata* Lindl.**, Botanical Register 9: t. 757 (1823); Spreng.: 152 (1827); Meisn.: 441 (1840); Drège: 123 (1843); Meisn.: 585 (1857); C.H.Wright: 63 (1915). *G. tomentosa* sensu Hook.: t. 2761 (1827) non Thunb. Type: South Africa, in nemorosis prope George, IV. C. b., Drège (NY, iso!).

Shrub to small tree up to 3 m tall (Wright 1915). Branches slender, erect to laxly arching, and pilose when young, glabrescent with age. Leaves simple, exstipulate, 3–5-veined from base, clustered towards ends of branches, pilose when young. Inflorescences terminal or lateral clusters comprising 4–6 tubular, pale flowers; involucre bracts green, foliaceous, smaller than leaves, as long as hypanthia. Flowers 4-merous, sweetly scented at night; petaloid scales paired, narrowly oblong, alternating with calyx lobes. Stamens 8, in 2 rows in mouth and throat of tube.

The pilose young stems, leaves and flowers, together with the comparatively rare condition of broadly foliaceous leaves that are three to five-veined from the base, distinguish this species.

Some confusion has arisen regarding the nomenclature of *G. denudata* and *G. tomentosa*. Linnaeus (1753) described *G. tomentosa* from the mountains of the Cape Peninsula and Worcester areas. This shrub attains about 1 m in height and bears slightly scabrid, semi-coriaceous leaves which have verrucose surfaces: a result of raised epidermal cells around the bases of hairs. Flowers, ± 6 , are produced only in terminal inflorescences. Hooker (1827) misapplied *G. tomentosa* to plants of *G. denudata*. Leaves of *G. denudata* lack the coarse texture and verrucose surfaces typical to *G. tomentosa*. In addition, the narrowly oblong petaloid scales of *G. denudata* distinguish it from *G. tomentosa* which has broad fleshy scales.

The distribution of this species shows a clear disjunction (Figure 10). It occurs south of Oudtshoorn and in the Knysna District of Western Cape and in the Willowmore District of Eastern Cape, where it inhabits margins of afro-montane forest (Lubke & McKenzie 1996). Additional, less precise, distribution records (omitted from Figure 10) come from Western and Eastern Cape, the Swellendam Mountains; near Touws River, and the forest at Elands River, Tsitsikamma, Humansdorp (Wright 1915). The population from Inhaca Island,

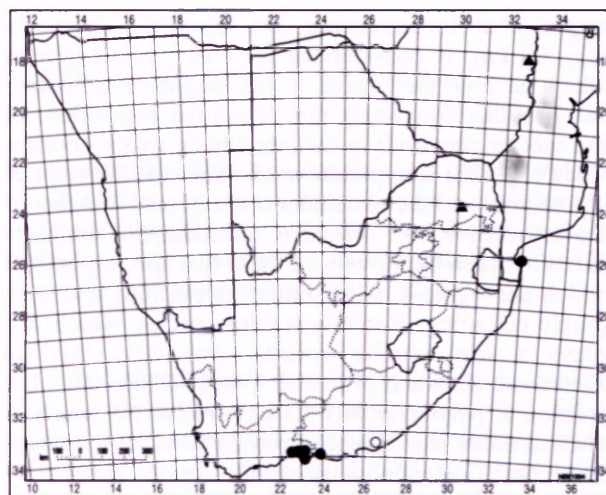


FIGURE 10.—Recorded distribution of *Gnidia denudata*, ● (O disputed record); *Plectranthus dolomiticus*, ▲.

Mozambique, is highly disjunct. A specimen housed in the Geneva Herbarium and apparently collected by Drège from Port Natal (Durban) is probably erroneously labelled, as this species does not appear in any of his listing of collections from the province (Drège 1843). The specimen *Coetzee s.n.*, collected in KwaZulu-Natal (and without any further locality details) in 1943, appears to be the only other collection from this province, which is curious in the light of the common occurrence of Cape relicts on the Natal Group Sandstone of the eastern seaboard (Van Wyk 1990). The species also appears to be absent from the mainland of Mozambique. Wright (1915) regarded the specimen, *Rogers 20682* (STE), collected near Grahamstown, as a doubtful record, but in the light of the Inhaca population, this may warrant further investigation.

Specimens examined

WESTERN CAPE.—3322 (Oudtshoorn): Saasveld Forestry College, (–DC), *Beaumont & Smith s.n.* (NU); Karatura River, (–DD), *Schlechter 5887* (C). 3323 (Willowmore): Diepwalle Forest Reserve, (–CC), *Bos 735* (STE). 3423 (Knysna): between Kruisfontein and Bracken Hill, (–AA), *Dahlgren & Peterson 1484* (GB).

EASTERN CAPE.—3323 (Willowmore): Camel Pile, (–DD), *Esterhuysen 27327* (GB). 3326 (Grahamstown): Grahamstown, (–BC), *Rogers 28682* (GRA).

KWAZULU-NATAL.—Precise locality unknown: *Coetzee s.n.* (J), *Drège s.n.* (G).

MOZAMBIQUE.—2632 (Bela Vista): Inhaca Island, (–BB), *Maguire 35* (J).

LAMIACEAE

Plectranthus dolomiticus was described in 1984 by Codd. At that time, and in the subsequent *FSA* account (Codd 1985), the species was known only from the type locality near Penge Mine in Mpumalanga. Recently, a second population of the species was recorded from granite domes in Zimbabwe (Figure 10). While the geology of the respective sites is different, the physical aspects are very similar. Both populations occur in arid woodland on rock outcrops where plants occur in humus-filled crevices. During the dry season the species withers aerially and the populations rely on subter-

ranean tubers for sustenance. The disjunction, approaching 700 km, is considerable for *Plectranthus* species which have no mechanism to aid long-distance dispersal. It is therefore likely that additional populations of the species occur(ed) in the intervening rocky savanna. Codd's (1985) interpretation of alliances, between *P. dolomiticus* and the remainder of the genus, was that its closest relative is *P. petiolaris*. Considerable similarity exists between the flowers of these two species, both of which are sigmoid, with similar proportions and deep purple colouring. Recently a third species, which displays a very similar corolla, was discovered in Zimbabwe (Edwards, Paton & Crouch 2000). This last species, *P. porphyranthus* T.J. Edwards & N. Crouch, is without doubt convergent in corolla form for it belongs to section *Coleoides*, whereas the former species are members of section *Plectranthus*. The convergence is probably being driven by widespread anthophorid bees, of the genus *Amegilla*, which are the primary pollinators. *Amegilla caelestina* (Cockrell), *A. fallax* (Smith) and *A. bothai* (Meadt-Woldo) were recorded on *P. porphyranthus*, and *A. caelestina*, *A. bothai* and *A. mimadvena* (Cockrell) are the primary pollinators of *P. petiolaris*. The proposed alliance of *P. dolomiticus* with *P. petiolaris* (Codd 1985), based on corolla characters, may need reviewing in light of the convergent corolla design of *P. porphyranthus*.

Specimens examined

Plectranthus dolomiticus

ZIMBABWE.—1832 (Juliasdale), Pine Lake Inn, (–BA), Vos 339 (NU).

Plectranthus porphyranthus

ZIMBABWE.—2029 (Harare), Masvingo, (–BB) Richmond Farm, Crouch 800 (E. K. NH, NU, PRE); Harare, 3 miles [4.8 km] east of Zimbabwe (ruins), Leach 8043 (PRE).

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