

## The identity of *Pachystigma bowkeri* (Rubiaceae, tribe Vanguerieae)

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Since its publication the name *Pachystigma bowkeri* Robyns has not been taken up and various authors suggested that the taxon to which it was applied might be conspecific with *P. macrocalyx* (Sond.) Robyns. In a recent study of the genus in southern Africa it was established that *P. macrocalyx* constitutes a heterogeneous taxon. Two species should be recognized with *P. bowkeri* Robyns being the correct name for one of these. The name *P. bowkeri* Robyns is therefore reinstated.

Sedert sy publikasie is die naam *Pachystigma bowkeri* Robyns nooit gebruik nie en verskeie outeurs het voorgestel dat die spesie waarop die naam betrekking het gelyksoortig met *P. macrocalyx* (Sond.) Robyns is. Tydens 'n onlangse studie van die genus in suidelike Afrika is vasgestel dat *P. macrocalyx* 'n heterogene takson verteenwoordig. Twee spesies moet erken word met *P. bowkeri* Robyns die korrekte naam vir een van hierdie spesies. Die naam *P. bowkeri* Robyns word dus heringestel.

**Keywords:** *Pachystigma*, Rubiaceae, taxonomy, Vanguerieae

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### Introduction

The demarcation of *Pachystigma macrocalyx* (Sond.) Robyns and *P. bowkeri* Robyns is considerably confused. Since its publication by Robyns in 1928 the name *P. bowkeri* has not been taken up. Various authors including Coates Palgrave (1977), Palmer & Pitman (1973), Gibbs Russell *et al.* (1984) and von Breitenbach (1986), relegated *P. bowkeri* to the synonymy of *P. macrocalyx* and thus contributed to the disuse of the name. Notes on some species covers in herbaria also state that the two species cannot be separated by the hairiness of the leaves owing to the existence of intermediate specimens. To add to the confusion, the same specimen (Pegler 702) was apparently cited under both *P. macrocalyx* and *P. bowkeri* by Robyns (1928). However, a study of Pegler collections showed that the number 702 was assigned to at least three different gatherings — two belonging to *P. macrocalyx* and the third to *P. bowkeri*.

*Pachystigma macrocalyx* was first described in the genus *Vangueria* Juss. by Sonder in 1850. In 1865 Sonder used the hairiness of the leaf to distinguish this species from the other species of *Vangueria* that also had long calyx lobes and in the description, 'young branches, leaves and flowers tomentose' were printed in italics. Reference was made to the following specimens: *Ecklon & Zeyher Ebenac 17*; *H. Bowker s.n.* and *Gerrard & McKen 1344*.

Robyns (1928) reinstated the genus *Pachystigma* Hochst. to accommodate *Vangueria macrocalyx* and a few other species. In the same year Robyns described *P. bowkeri* and designated *Bowker s.n.* [the same specimen cited by Sonder (1865) under *Vangueria macrocalyx*] as the type of the new name. Although some of the differentiating characters mentioned in the diagnosis may also be found in other species of the genus, it is evident that the newly described species was separated from *P.*

*macrocalyx* mainly by its hairless leaves and calyx.

When referring to some of the diagnostic features of *P. macrocalyx* (shrub with small densely velvety leaves), Palmer & Pitman (1973) drew attention to the presence of tall trees with large almost smooth leaves in the forests of Zululand. They speculated that although these trees were also at that stage referred to *Pachystigma macrocalyx*, they may in future be treated as a different taxon.

A recent investigation, Boshoff (1987), revealed that *P. macrocalyx* represents a heterogeneous taxon comprising at least two distinct species, namely *P. macrocalyx* and *P. bowkeri*. The differences between the two species are summarized in Table 1.

In evaluating the taxonomic significance of the characters differentiating between the two species, it is evident that in the Rubiaceae they are being used by various authors at different hierarchical levels. For example, the size of the leaf blade was used to distinguish between species of *Alberta* E. Mey. (Puff *et al.* 1984) *Calycosiphonia* Pierre ex Robbrecht (Robbrecht 1981b) and *Vangueria* (Verdcourt 1982). Habit and leaf texture,

**Table 1** Selected distinctions between *P. macrocalyx* and *P. bowkeri*

	<i>P. macrocalyx</i>	<i>P. bowkeri</i>
Habit	Shrubs or small trees	Small to medium-sized trees
Leaf blade		
Surface	Velvety	Glabrous, rarely hairy
Texture	Coriaceous	Chartaceous
Length	(20–)25–45(–50 mm)	(25–)65–145(–215 mm)
Width	(15–)18–25(–30 mm)	(20–)30–70(–85 mm)
Peduncle (length)	0–3 mm	2–8 mm
Habitat	Savanna, rarely forest	Forest

together with other features, were considered as practical key characters to separate *Alberta* and *Nematostylis* Hook. (Puff *et al.* 1984).

Bridson (1987) also employed the texture of the leaf to differentiate between species of *Multidentia* Gilli. Characters of the leaf indumentum, in particular hairiness, are extensively used in the demarcation of taxa in the Rubiaceae. The two varieties of *Otiophora lebruniana* (Bamps) Robbrecht & Puff are distinguished on this basis (Robbrecht & Puff 1981), whereas in *Argocoffeopsis* Leb. (Robbrecht 1981b), *Tricalysia* A. Rich. ex DC. (Robbrecht 1981a) *Vangueria* (Verdcourt 1987), *Psydrax* Gaertn. (Bridson 1985) and many other genera, hairiness of the leaf serves as a differentiating character between species. Moreover, the genus *Tapiphyllum* Robyns is separated from related genera mainly on the

basis of the velvety-tomentose character of most parts of the plant (Verdcourt 1987). In the genus *Pachystigma* the presence or absence of hairs on the leaves was also used by Verdcourt (1982) to differentiate between *P. kenyense* Verdc. and *P. burttii* Verdc. Peduncle length is also considered a distinguishing character between taxa, and it has for example been used in the genera *Psydrax* (Bridson 1985) and *Vangueria* (Verdcourt 1982).

### Description

***Pachystigma bowkeri*** Robyns in Bulletin du Jardin Botanique de L'Etat Bruxelles 11: 129 (1928). Type: Queenstown, Kreilis, *Bowker s.n.* (K, holo.!).

*Vangueria macrocalyx* Sonder 14 (1865), pro parte, quoad *Bowker s.n.*

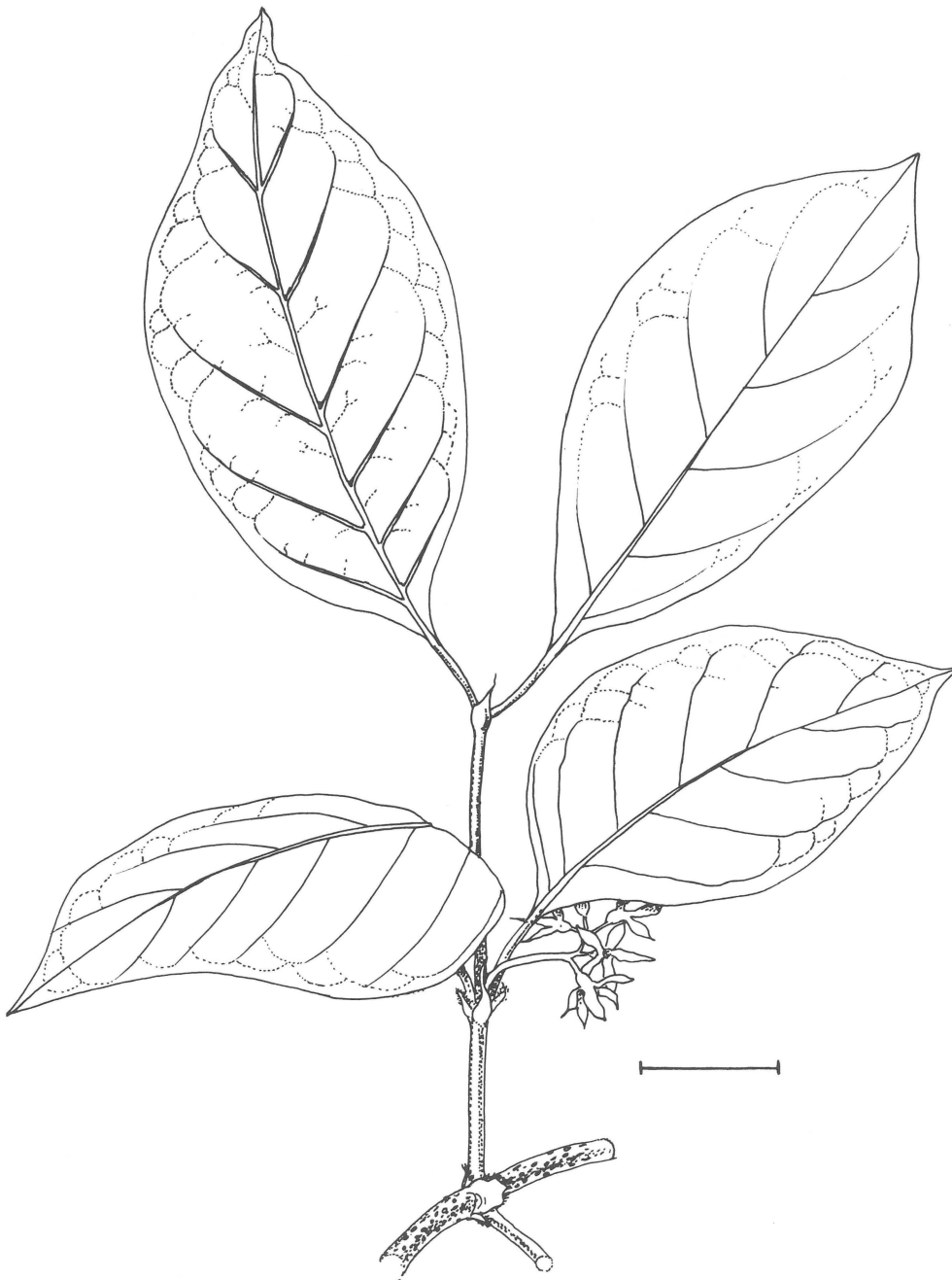


Figure 1 *Pachystigma bowkeri*. Flowering branchlet, scale line = 20 mm. Ward 7331.

Small to medium-sized tree, semi-deciduous to deciduous; bark dark grey, longitudinally fissured. *Young twigs* glabrous or with a few fine hairs, often with conspicuous lenticels. *Leaves* opposite, located towards the apices of branches but not clustered; petiole 2–8 mm long; lamina obovate, (25–)65–145(–215) × (20–)30–70(–85) mm, base cuneate, apex obtuse to ± rotund or slightly acute, chartaceous, glabrous or occasionally sparsely hairy; midrib slightly raised above, prominently below, principal lateral veins alternate, (2–)3–5 pairs; stipules broadly based and tapering to a fine point, up to 5 mm long. *Inflorescences* 3–5-flowered, cymous, axillary, peduncle up to 8 mm long; pedicels up to 2 mm long; bracts inconspicuous. Flowers bisexual, actinomorphic, epigynous and pentamerous. *Calyx* green, glabrous to slightly hairy outside, glabrous inside, tube short, campanulate, lobes lanceolate, 7–10 long. *Corolla* pale green to greenish-yellow, tube cylindrical, widening somewhat towards the mouth, glabrous outside, mouth of tube with a fringe of whitish hairs, lobes triangular, 3–5 mm long, becoming reflexed with age. *Stamens* alternipetalous, inserted below the rim of the corolla tube; filaments shorter than the anthers, exerted; anthers with apex acute, base sagittate. *Disc* annular, entire. *Ovary* obconical, 5-locular, with one ovule in each locule; style 4 mm long, terete, exerted; stigma conical. *Fruit* a pyrene, ripening to dark brown or blackish, 5-seeded (Figure 1).

The geographical distribution of *P. bowkeri* (Figure 2) corresponds with that of several other woody rubiaceaceous species, for example *Psychotria capensis* (Eckl.) Vatke, *Rothmannia capensis* Thunb., *Tricalysia lanceolata* (Sond.) Burt Davy and *Canthium suberosum* Codd. These characteristically sparse and widely disjunct distribution patterns may be indicative of a previous wider distribution.

Except for *P. macrocalyx* (Figure 3), *P. bowkeri* is not closely related to any other species of *Pachystigma* in southern Africa. In the protologue of *P. kenyense*, a

species confined to Kenya, Verdcourt (1982) stated 'affinis *P. bowkeri* Robyns'. *P. kenyense* is regarded as a synonym of *P. gillettii* (Tennant) Verdc. (Verdcourt 1987). The treatment of *P. bowkeri* as a separate species by Verdcourt (1982) lends support to the recognition of *P. bowkeri*.

If indeed this is the case, the resultant discontinuity in distribution recalls the distribution pattern of *Tricalysia africana* (Sim) Robbrecht, a Pondoland endemic separated by a wide interval from its putative Guineo-Congolese relatives (Robbrecht 1985).

#### Specimens examined

- 2230 (Messina): Tate Vondo Forest Reserve, Sibasa (–CD), *Hemm 347* (PRE).
- 2329 (Pietersburg): Blaauwberg (–AA), *Codd & Dyer 9124* (PRE).
- 2430 (Pilgrim's Rest): Mariepskop (–DB), *Van der Schijff 4735* (PRE), 5852 & 6276 (both PRE, PRU); Pilgrim's Rest (–DD), *Van der Schijff 6113* (PRE).
- 2527 (Rustenburg): Breedts Nek, Magaliesberg (–CD), *Botha 2079* (PRE); Brits, Jacksonstun (–DA), *Van Vuuren 464* (PRE).
- 2632 (Bela Vista): Jilobi Forest (–CA), *Kemp 1337* (PRE).
- 2731 (Louwsburg): Louwsburg (–CD), *Gerstner 4488 & 5182* (PRE) both; Ngome State Forest, Ntendeka (–CD), *Jordaan 602* (NH), *MacDevette 502* (NH), *Van Wyk 7019* (PRU).
- 2732 (Ubombo): Ingwavuma (–AA), *Gerstner 4069* (NH); Mkanes Pont (–AB), *Garland s.n.* (PRE); Emagwaliweni (–AC), *Gerstner 3772* (NH); Gwalaweni Forest (–AC), *Moll 4481* (NH, PRE), *Vahrmeijer & Hardy 1676* (PRE).
- 2831 (Nkandla): Hluhluwe Game Reserve (–BB), *Ward 1710* (NH), *Ward 2970* (NH, PRE), *Wells 2134* (PRE); Eshowe (–CD), *Thode A1239* (NH, PRE); Nkandla (–DC), *Jordaan 399* (NH).
- 2930 (Pietermaritzburg): Seaton Park (–CC), *Schrire 1473* (NH); Camperdown (–DA), *Morris 557* (PRE); Pigeon Valley, Durban (–DD), *Edwards 3183* (PRE), *Nichols 451*

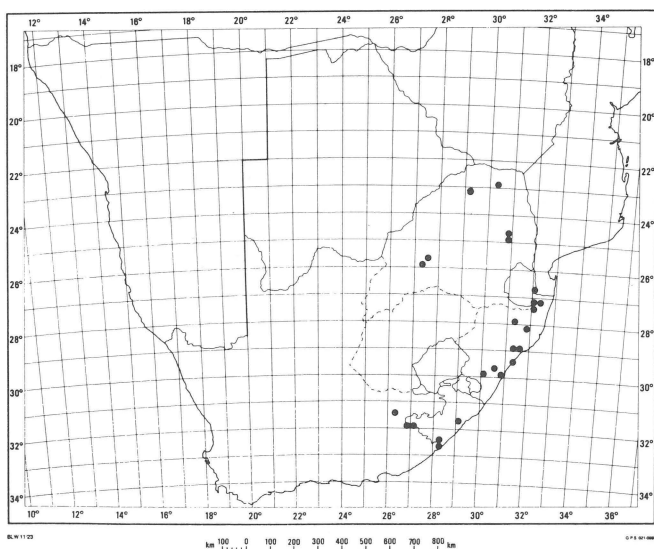


Figure 2 The known geographical distribution of *Pachystigma bowkeri*.

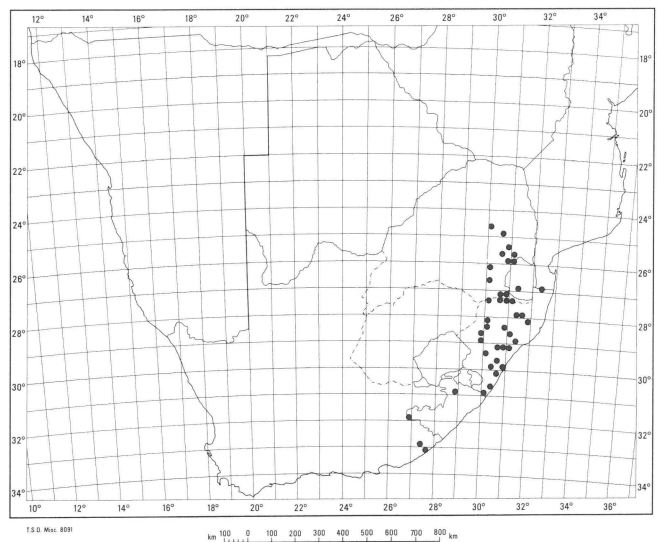


Figure 3 The known geographical distribution of *Pachystigma macrocalyx*.

(NH), *Schrire 692* (NH); Durban (-DD), *Thorns & Strey 5342* (NH); University of Natal (-DD), *Ward 7331* (PRE).  
 —**2931** (Stanger): Hlogweni (-AD), *Moll 3341 & 3342* (both PRE).  
 —**3126** (Queenstown): Kreilis (-AD), *Bowker s.n.* (K, holo.); Queenstown (-DD), *Galpin 2559* (PRE).  
 —**3127** (Lady Frere): Glen Grey (-CC); *Galpin 2505* (GRA, PRE).  
 —**3129** (Port St. Johns): Port St. Johns (-DA), *Flanagan 2519* (PRE).  
 —**3128** (Butterworth): Kentani (-AD), *Pegler 702* (1901) (PRE); Kei Mouth (-CB), *Flanagan 876 & 1891* (both PRE); Between Kentani and Qolara (-CB), *Van Wyk 3236* (PRU).

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