

Raphionacme lobulata (Periplocaceae), a new species from the eastern Cape Province, South Africa

H.J.T. Venter* and R.L. Verhoeven

Department of Botany, University of the Orange Free State, Bloemfontein, 9300 Republic of South Africa

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Raphionacme lobulata Venter & Verhoeven, a new species discovered in the Fish River Valley, in the eastern Cape, is described. This species is distinguished by its glabrous appearance, reddish glossy bark, glossy coriaceous leaves, hemispherical mucronate interpetiolar teeth, petiolar and blade prickles, and hemispherical corona lobules. *R. lobulata* mostly resembles *R. abyssinica* Chiov., *R. flanaganii* Schltr. and *R. monteiroae* (Oliv.) N.E. Br., especially with regard to the woody, perennial aerial stems. The habit of growth, bark and leaves also resemble *Petopentia natalensis* (Schltr.) Bullock, but the floral structure places this new species in *Raphionacme*. *R. lobulata* inhabits the dry euphorbiaceous scrub forest on the banks of the Fish River.

Raphionacme lobulata Venter & Verhoeven, 'n nuwe soort wat in die Visriviervallei in die oostelike Kaap gevind is, word beskryf. Hierdie soort is aan die haarloosheid, rooierige, glansende bas, glansende, leeragtige blare, halfseriese, gemukroneerde interpetiolêre tande, petiolêre- en blaarskyfstekels, en halfseriese bykroonlobbetjies onderskeibaar. *R. lobulata* stem die meeste met *R. abyssinica* Chiov., *R. flanaganii* Schltr. en *R. monteiroae* (Oliv.) N.E. Br. ooreen, veral ten opsigte van die houtagtige, meerjarige lugstingels. Die groeiwyse, bas en blare van *R. lobulata* vertoon ook met *Petopentia natalensis* (Schltr.) Bullock ooreenkoms, maar die bou van die blom plaas hierdie nuwe soort in *Raphionacme*. *R. lobulata* groei in droë euphorbiaryke struikwoud op die oewers van die Visrivier.

Keywords: Africa, Periplocaceae, *Raphionacme lobulata* sp. nov., taxonomy

*To whom correspondence should be addressed

Introduction

Fifty years ago the late taxonomist, R.A. Dyer came across a strange climber in the bank forest near the confluence of the Kap and Fish Rivers, about 6,4 km upstream from the Fish River mouth. Only one plant was found from which two specimens were collected. Both are housed in the National Herbarium Pretoria (PRE).

Attempts to identify the plant were made first by taxonomists at the National Herbarium, Pretoria (PRE) and later at the Herbarium of the Royal Botanic Gardens, Kew, London (K), without success. Tentative suggestions that the plant be referred either to the genus *Taczazea* or to the genus *Petopentia* were rejected, since it appears to be morphologically distinct from both these genera.

The senior author studied this material at PRE and discovered the typical *Raphionacme* characters in the flower, deep corolla tube, corona lobes arising from the corolla mouth and these lobes fused with the staminal filaments. It is undoubtedly a *Raphionacme* species, but a strange one indeed. The climbing habit, small hemispherical corona lobes, the glossy reddish stem bark and the glossy coriaceous leaves are a combination of characteristics new to *Raphionacme*. The specific epithet alludes to the small hemispherical corona lobes which are unique for *Raphionacme*.

The authors visited the locality where the plant was collected by Dyer. However, the search proved futile. The scrub forest is so dense that one could well have passed the plant within touching distance without recognizing it, especially since the ovate leaf form of *R. lobulata* is common in this forest. Dyer (pers. comm. 1987) puts it very aptly: 'It was not seen more than the once and was rather inconspicuous, so it would need luck to rediscover it'. Human influence on the local vegetation is very obvious and it may well be true that *R. lobulata* has disappeared from the vegetation that it inhabited half a century ago.

Description

***Raphionacme lobulata* Venter & Verhoeven, sp. nov.**

R. abyssinica Chiov., *R. flanaganii* Schltr. et *R. monteiroae* (Oliv.) N.E. Br. affinis sed plantis glabris, laminis nitidis et coriaceis, coronae lobis bilobularibus et haemisphaericis, distinguenda.

Perennis glabra planta scandens. *Caules* volubiles. *Folia* opposita; petiolus sulcatus et aculeatus; lamina lanceolata, coriacea, nitida; margo integer undulatus. *Inflorescentia* cymosa, pedunculus 5–15 mm longus, pedicelli 4–5 mm longi, bractae triangulatae. *Flos* actinomorpha, hermaphroditus. *Sepala* 5, discreta, late triangulata. *Corolla* campanulata; lobi 5, triangulati vel ovati, pagina adaxialiter hirsuta. *Corona* lobi 5, bilobulares, hemisphaerici, 0,5 mm longi. *Stamina* 5, exorientia basi coronae; antherae subsessiles, anguste ovatae; geruli pollinis lati ovati. *Ovaria* 2, gynostegium late angulariter ovoideum.

TYPUS. — Cape Province: Bathurst District, 6,4 km from Fish River mouth near Kap River, *Dyer 3381* (PRE, holotypus and isotypus).

Perennial climber. *Stems* twining, glabrous, reddish, up to 5 mm in diameter. *Leaves* simple, opposite, glabrous, with hemispherical mucronate interpetiolar teeth; petiole 8–10 mm long, grooved, with reddish prickles in groove; blade ovate, coriaceous, 60 × 20 mm, adaxially glossy and darker green with veins sunken and reticulate, abaxially pale green, with veins raised, margin entire and undulate, apex acute to acuminate and recurvate, base obtuse with reddish prickles. *Inflorescence* cymose with monochasial branches of up to 10 flowers, glabrous; peduncles 5–15 mm long, pedicels 4–5 mm long; bracts triangular, margins membranous and often ciliate. *Flowers* actinomorphic, bisexual, pentamerous. *Sepals* 5, free, broadly triangular, 2 × 1 mm, margins as in inflorescence bracts, apex acute. *Corolla* campanulate, green, 6 mm long; tube 2 mm long, glabrous; lobes 5, triangular to ovate, 4 × 2 mm, apex obtuse, outside glabrous, inside hirsute with white hairs. *Corona* of 5 dark

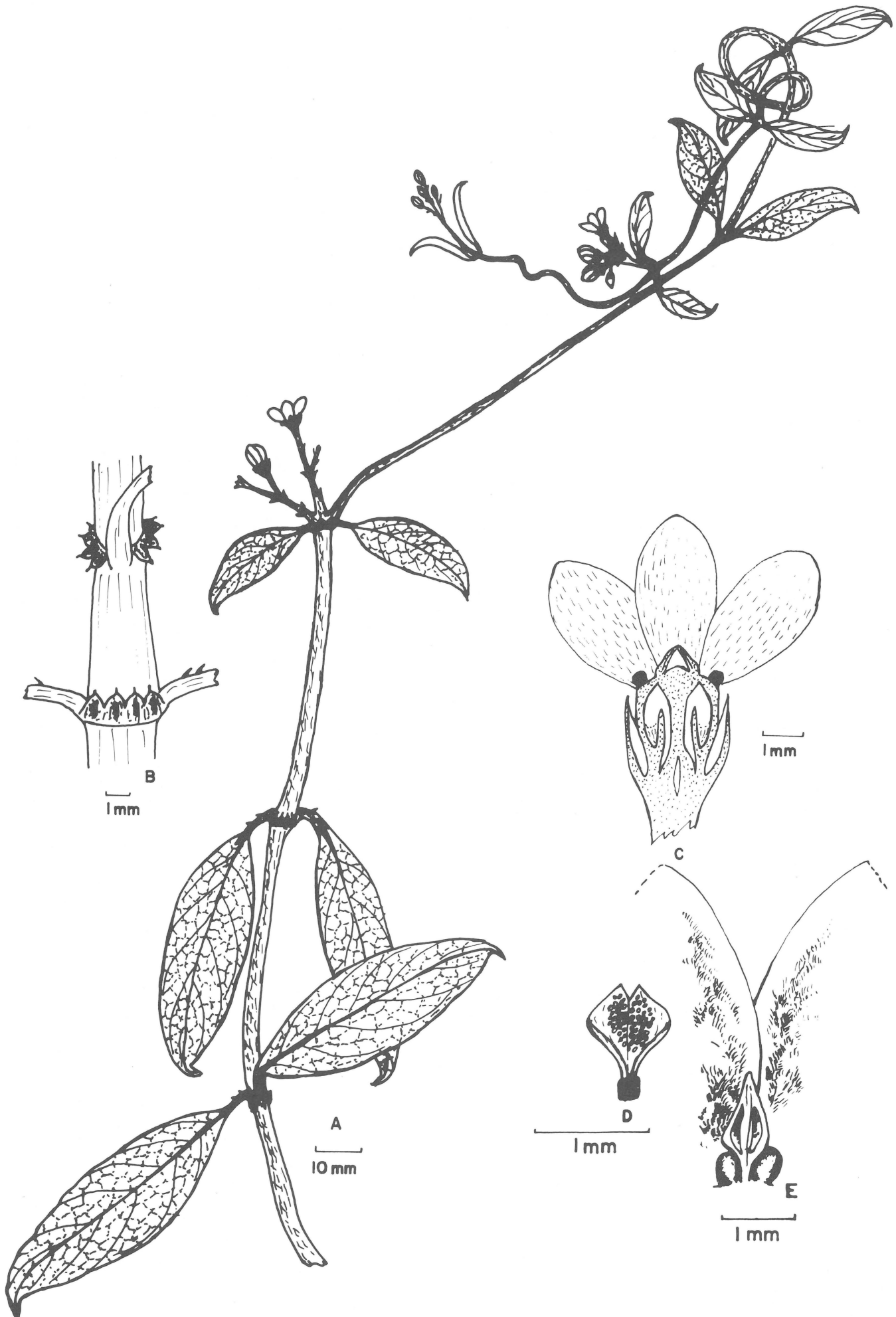


Figure 1 *Raphionacme lobulata*. A. Habit; B. part of stem with interpetiolar teeth and petiole prickles; C. longitudinal sectional view of flower with hemispherical corona lobules; D. pollen carrier; E. corona lobules and stamen [A-E from A.D. Dyer 3381 (PRE)].

green bilobed hemispherical lobules of 0,5 mm long arising from corolla mouth and alternating with corolla lobes. *Stamens* 5, inserted on inner face of corona lobes, subsessile; filaments adnate to corolla forming 5 vertical ridges on inner wall of corolla tube; vertical ridges fused at their bases forming pouches and erect radulate outgrowths around the style; anthers angular ovate, 1 mm long, apex mucronate; pollen carriers very broadly ovate and shortly stalked, 1 mm long; pollen grains united as tetrads; tetrads

arranged rhomboidally with a few tetragonally, $37 \times 36 \mu\text{m}$ (tetragonal) to $(39-42(-46) \times (32-40(-39) \mu\text{m}$ (rhomboidal); single grains 8-porate; pores restricted to junction area of adjacent grains, sometimes covered with a layer of exine material. *Ovaries* 2, semi-inferior, 0,5 mm long; style terete, 1,5 mm long; gynostegium broadly angular ovate, $0,5 \times 1 \text{ mm}$. *Fruit* and *seed* unknown. (Figures 1 & 3).

Distribution and ecology

R. lobulata was collected in one locality only (Figure 2). The plant grew in dry euphorbiaceous scrub forest that clothes the banks of the Fish River where it was found climbing into trees.

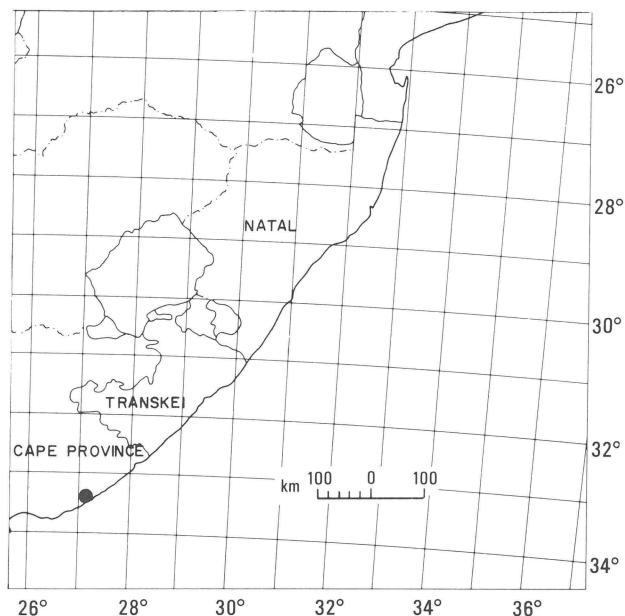


Figure 2 The known geographic distribution of *Raphionacme lobulata*.

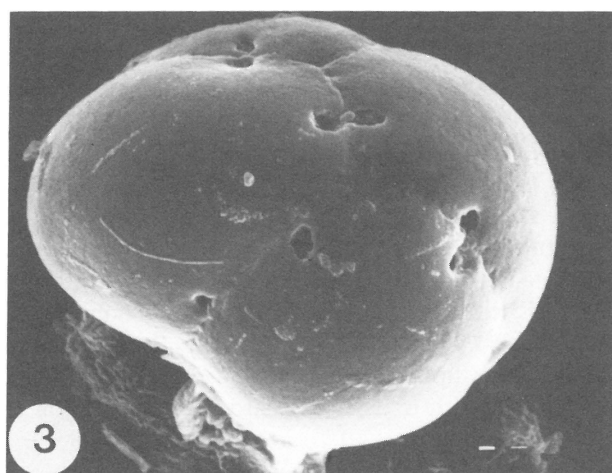


Figure 3 Scanning electron micrograph of rhomboidal pollen tetrad of *R. lobulata*. Scale = 1 μm .

Table 1 Similarities and differences between *Raphionacme lobulata*, the other species of *Raphionacme* and *Petopentia natalensis*

	Erect species	Habit of growth							
		Climbers							
		<i>R. longifolia</i>	<i>R. procumbens</i>	<i>R. welwitschii</i>	<i>R. abyssinica</i>	<i>R. flanaganii</i>	<i>R. lobulata</i>	<i>R. monteiroae</i>	<i>Petopentia natalensis</i>
Aerial stem									
1. Annual/perennial	annual	annual	annual	annual	perennial?	perennial	perennial	perennial	perennial
2. Length (up to in m)	0,5	1,2	0,5	1,0	1,5	3,0	3,0?	3,0	6,0+
3. Texture	herbaceous	herbaceous	herbaceous	herbaceous	woody	woody	woody	woody	woody
4. Bark	hairy, not glossy	hairy, not glossy	hairy, not glossy	hairy, not glossy	hairy, not glossy	hairy, not glossy	glabrous, glossy	hairy, not glossy	glabrous, glossy
Leaf									
1. Interpetiolar stipules	subulate	subulate	subulate	subulate	subulate	hemi-spherical	hemi-spherical	subulate or hemi-spherical	subulate + tuft of hairs
2. Petiolar prickles	absent	absent	absent	absent	absent	present	present	absent	absent
3. Blade texture	herbaceous	herbaceous	herbaceous	herbaceous	herbaceous	herbaceous	coriaceous	herbaceous	coriaceous
4. Venation	curving towards apex or divaricate	curving	divaricate	curving	curving	divaricate	curving	curving	divaricate
5. Surface	hairy, rarely glabrous and glossy	hairy	hairy	hairy	hairy	hairy	glabrous and glossy	hairy	glabrous and glossy
Flower									
1. Shape of bud apex	obtuse to acute	acute	obtuse	acute	obtuse	acute	obtuse	acute	apiculate
2. Corona	tripartite or simple, never lobular	tripartite	simple and serrate	tripartite	simple and trifid	tripartite	bilobular	tripartite	simple and filiform

Discussion

Raphionacme lobulata conspicuously differs from the other species of this genus, even from its climbing allies. It is clearly distinguished by the glabrous condition of the plants, the reddish glossy bark, glossy coriaceous leaves, hemispherical mucronate interpetiolar teeth, petiolar and blade prickles, and the hemispherical corona lobules (Table 1). It mostly resembles *R. abyssinica* Chiov., *R. flanaganii* Schltr. and *R. monteiroae* (Oliv.) N.E. Br. which are also woody climbers. This group of four species is very disjunctly distributed. *R. abyssinica* inhabits the dry scrub savanna in Ethiopia in north-east Africa, *R. monteiroae* is found in the dry scrub savanna of south-central and south-east Africa, *R. flanaganii* occurs in humid forest in southern Africa, while *R. lobulata* was collected in dry river bank forest of southern Africa.

Raphionacme lobulata may be confused with *Petopentia natalensis* (Schltr.) Bullock. However, *R. lobulata* has leaves in which the secondary veins curve towards the blade apex and the corona lobes are lobular. *P. natalensis*, in contrast has leaves with divaricate venation and the corona lobes are filiform.

Even though the insertion and fusion of the androecium and corona in the corolla mouth are similar in both *R. lobulata* and *P. natalensis*, this new species could not be classified in *Petopentia* Bullock since *R. lobulata* exhibits the obtusely to acutely tipped flower bud and deep corolla tube of *Raphionacme* with its very typical vertical ridges on the

inside of the tube. *P. natalensis*, in contrast, has the *Cryptolepis* type of bud with apiculate apex. Its corolla tube, furthermore, is very shallow and without any ridges.

Raphionacme lobulata has the smallest pollen grains (mean tetrad size $42 \times 40 \mu\text{m}$) of all *Raphionacme* species. In the other species the pollen tetrads vary in size from $56 \times 44 \mu\text{m}$ [*R. hirsuta* (E. Mey.) R.A. Dyer] to $93 \times 87 \mu\text{m}$ (*R. keayii* Bullock) (Verhoeff & Venter 1988).

Specimen examined

—3327 (Peddie): Cape Province, Bathurst District, 6,4 km from the Fish River mouth near the Kap River (–AC), Dyer 3381 (PRE, two sheets).

Acknowledgements

We are indebted to the late Dr R.A. Dyer for his assistance in tracing the original collecting locality of *R. lobulata*. Even though half a century has passed, his directions were clear and accurate.

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Reference

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