Raphionacme moyalicus (Periplocaceae), a new species from Kenya

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Received 24 June 1996; revised 2 February 1997

Raphionacme moyalicus Venter & R.L. Verh., a new species from Moyale, Northern Frontier Province, Kenya, is described and figured. A map with its known distribution is also provided. *R. moyalicus* shows affinity with *R. michelii* De Wild., *R. borenensis* Venter & M.G. Gilbert and *R. arabica* A.G. Mill. & Biagi. These species all have in common filiform corona lobes and stamens with fleshy, laterally dilated filament bases. All are erect to spreading, single- or few-stemmed, geophytic herbs. *R. moyalicus* is distinguished by its long corona lobes, twice as long as the corolla lobes, the small flowers and the dense, scaberulous indumentum.

Keywords: Africa, Kenya, Periplocaceae (Asclepiadaceae), *Raphionacme moyalicus*, protologue, taxonomy.

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Introduction

Raphionacme Harv. is a genus of herbaceous geophytic species. Most are small, erect to spreading plants, a number are climbers and a few are prostrate in habit. All species have root tubers, mostly turnip-shaped, and hence the name *Raphionacme*. These tubers are often utilized as a food source or for their water, but in certain species they may be very poisonous.

Raphionacme species occur in a variety of habitats. The large majority inhabit grassland or savanna. A number are present in semi-desert environments, one in true desert and a few in swamps. The species of *Raphionacme* are rarely common, although they may be widely distributed geographically. Some of the species are so rare that they are only known from a single specimen, or at most a few specimens. However, adverse climatic conditions are often the cause of the scarcity of a species and once found under favourable conditions such a species may prove to be quite common (Bruyns 1994, Venter & Verhoeven 1996).

Raphionacme, with its 38 species, is almost entirely endemic to Africa. Only one species occurs outside Africa in Arabia (Miller & Biagi 1988). *Raphionacme* species are found under summer rainfall conditions, never under mediterranean climate.

R. moyalicus Venter & R.L. Verh. was discovered by J.B. Gillett in October 1952 whilst collecting plants at Moyale in the Northern Frontier Province of Kenya. His specimen was identified as belonging to the genus *Raphionacme*, but never to species level. In the Kew Herbarium, it was placed with *R. abyssinica* Chiov. [= *Triodoglossum abyssinicum* (Chiov.) Bullock], but never named as such. The first author found it amongst these *R. abyssinica* specimens and later listed it under the specimens of *R. borenensis* Venter & M.G. Gilbert. Closer examination showed this specimen, *Gillett 14021*, to be a new species.

Materials and Methods

External morphology was studied with a Zeiss Stereo Microscope. Pollen and pollen translators were obtained from the herbarium specimen, *Gillett 14021* (K). For light microscopy (LM), pollen was acetolysed according to the method of Erdtman (1960), mounted in glycerine jelly and sealed with paraffin wax. All measurements were made with the light microscope. For scanning electron microscopy (SEM), pollen was acetolysed, air-dried on stubs, coated with gold and examined with a Jeol Winsem 6400 microscope. The pollen translators were mounted on stubs with double-sided tape, coated with gold and examined with the Jeol Winsem 6400 microscope.

Pollen and translators

The pollen grains of *R. moyalicus* are united in tetrads with the grains arranged rhomboidally (Figure 1) or decussately. The

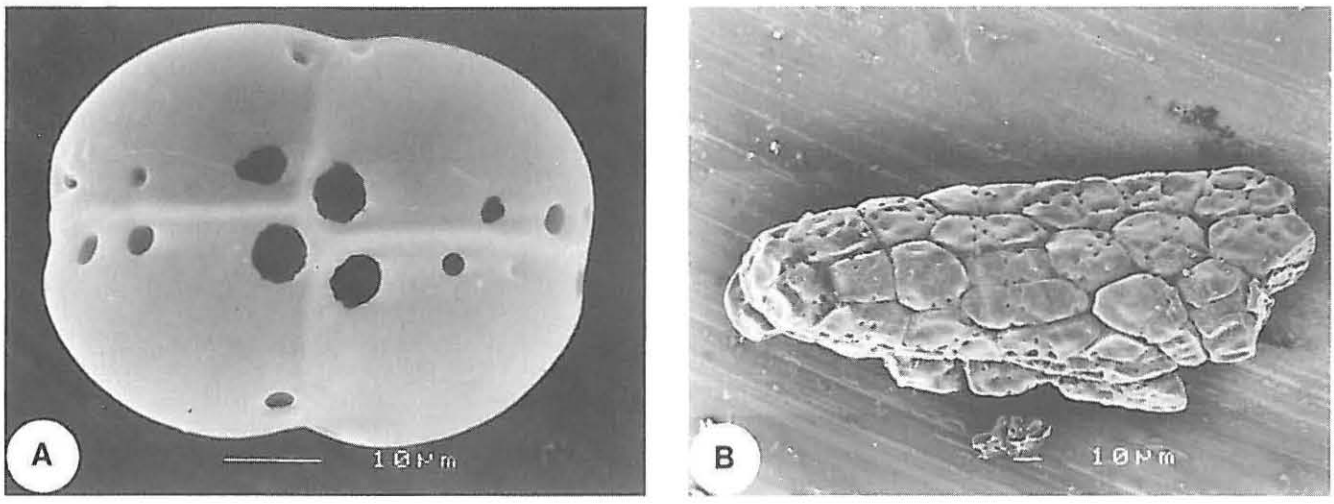

Figure 1 SEM micrographs of: **A**. rhomboidal tetrad of *Raphionacme moyalicus* [*Gillett 14021* (K)] and **B**. pollinium of *R. abyssinica* [*de Wilde 4121* (WAG)].

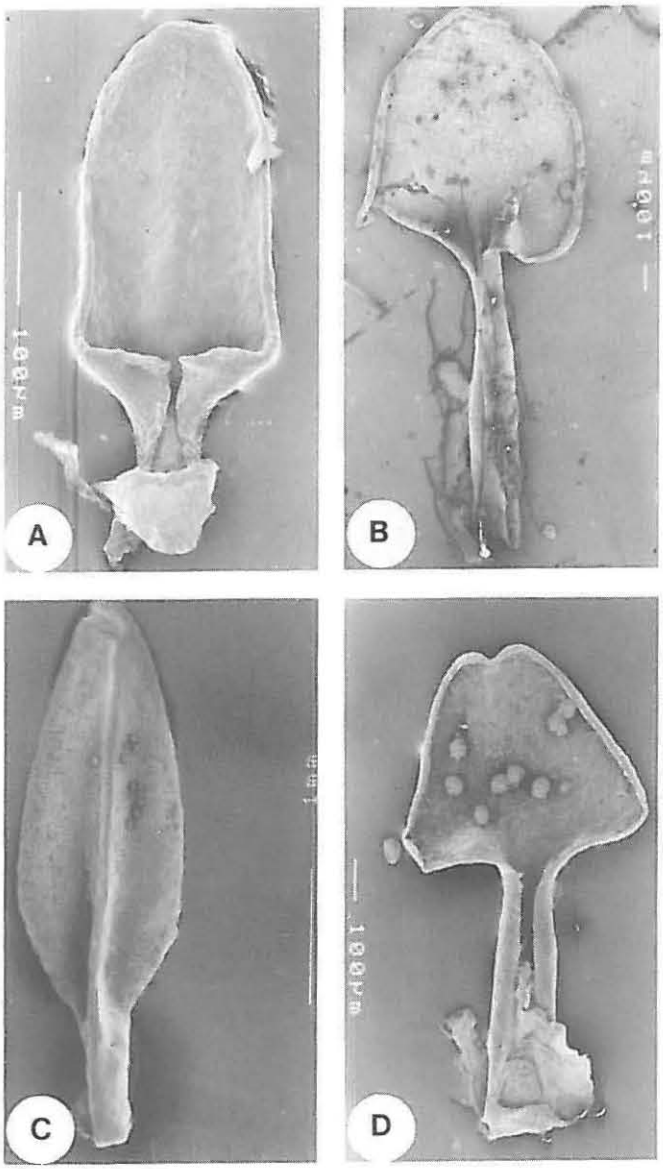

Figure 2 SEM micrographs of translators of: **A.** *Raphionacme abyssinica* [*de Wilde 4121* (WAG)]; **B.** *R. borenensis* [*Gilbert & Jones 66* (K)]; **C.** *R. michelii* [*Troupin 2119* (BR)] and **D.** *R. moyalicus* [*Gillett 14021* (K)].

rhomboidal tetrads ranged in size from 54.0–75.0 µm with an average of 63.5 ± 5.4 µm in length and 49.0–59.0 µm with an average of 53.2 ± 3.5 µm in width. Eight to ten pores occur per grain. The pores are round to elliptical, varying in size from 0.9–6.5 µm in diameter. The exine is smooth.

R. moyalicus (63.5 × 53.2 µm) can be distinguished from *R. borenensis* (75.0 × 64.0 µm) and *R. michelii* De Wild. (93.0 × 86.5 µm) by the average size of the rhomboidal tetrads (Verhoeven & Venter 1988). It can also be distinguished palynologically from *R. abyssinica* in which the pollen tetrads are united into pollinia (Figure 1).

The translator morphology of *R. moyalicus* and *R. borenensis* is quite similar (Figure 2). However, they differ in size, being 1.0–1.2 mm long in *R. moyalicus*, and 2.0–2.8 mm long in *R. borenensis*. The translator spoon in *R. michelii* is lanceolate and in *R. abyssinica* ovate, both differing from the broadly angular ovate spoon in *R. moyalicus*. Unfortunately, no material of the closely related *R. arabica* A.G. Mill. & Biagi was available and a comparison thus impossible.

Description

Raphionacme moyalicus Venter & R.L.Verh., *sp. nov.*

Raphionacme moyalicus similis *R. arabicae* A.G. Mill. & Biagi, *R. borenensis* Venter & M.G. Gilbert et *R. michelii* De Wild. lobis filiformis coronae et succulentis lateraliter dilatatis filamentis staminеis. Differt magnitudine florum, longitudibus coronae loborum, indumento.

TYPUS.— Kenya, Northern Frontier Province, Moyale, *Gillett 14021* (K, holo)

Erect herb of *ca.* 0.1 m tall. *Root* napiform tuber, 130 × 65 mm. *Underground stem* erect, 40 × 5 mm. *Aerial stems* erect, annual, 100 × 3 mm, branching laterally, brown, scaberulous. *Leaves* sessile to sub-sessile, interpetiolar colleters dentate, reddish; *blade* very narrowly ovate to very narrowly elliptic or obovate, scaberulous, margin undulate, laxiflorous, base cuneate, apex acute. *Inflorescence* paniculate, with 2–3 monochasial branches, each branch *ca.* 5-flowered, terminal and axillary, densely scaberulous, primary peduncle 15–20 mm long, secondary peduncles 5–10 mm long, pedicels 3–5 mm long; bracts ovate to broadly ovate, 0.5 mm long. *Sepals* sub-orbicular, scaberulous, *ca.* 0.6 × 0.6 mm, violet-maroon. *Corolla* 6.0–7.0 mm long, gynostegium just exserted from corolla mouth; *tube* campanulate, 2.5–3.0 mm long, outside scaberulous, inside conspicuously veined, vertically fluted and with nectar pockets at the base; *lobes* spreading, ovate, 3.5–4 × 1.5–2.0 mm, maroon-violet, abaxially densely scaberulous, adaxially glabrous, apex rounded. *Corona* at mouth of corolla-tube, lobes antesepalous, 5, free, filiform with base fleshy, dilated and concave, maroon-violet, 7.0–5.0 mm long, upper half tortuous. *Stamens* epipetalous, at base of corona, 5; *filaments ca.* 0.5 mm long, lower half fleshy, broadly sub-conical; *anthers* fused to stigmatic head at their bases, conniving in a cone, ovate, *ca.* 1.0–1.2 mm long, white with violet connective, apex acute; pollen tetrads rhomboidal or rarely decussate. *Pistil, ovaries* 2, sub-inferior, hemi-spherical, *ca.* 0.5 mm long; *style* terete, 1.5–2.0 mm long; *stigmatic head* pentangular

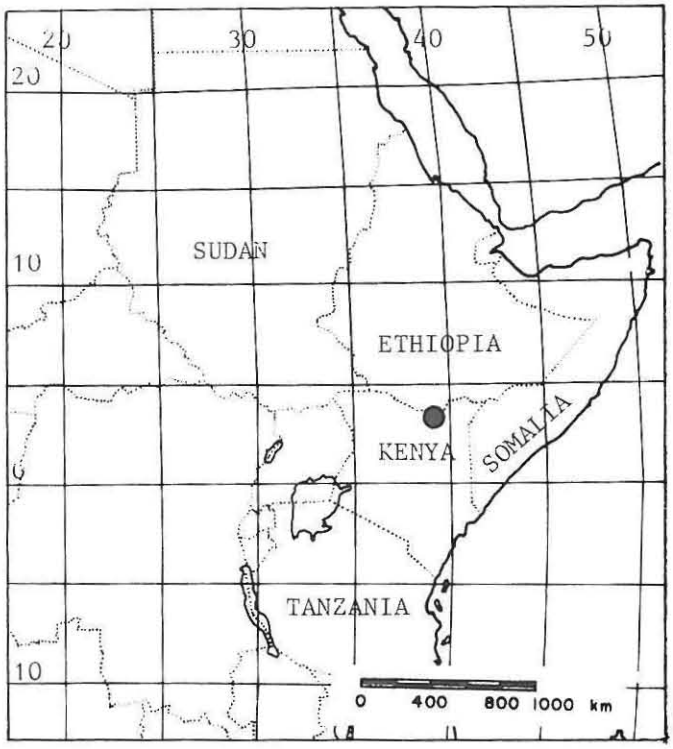

Figure 3 Known geographic distribution of *Raphionacme moyalicus*.

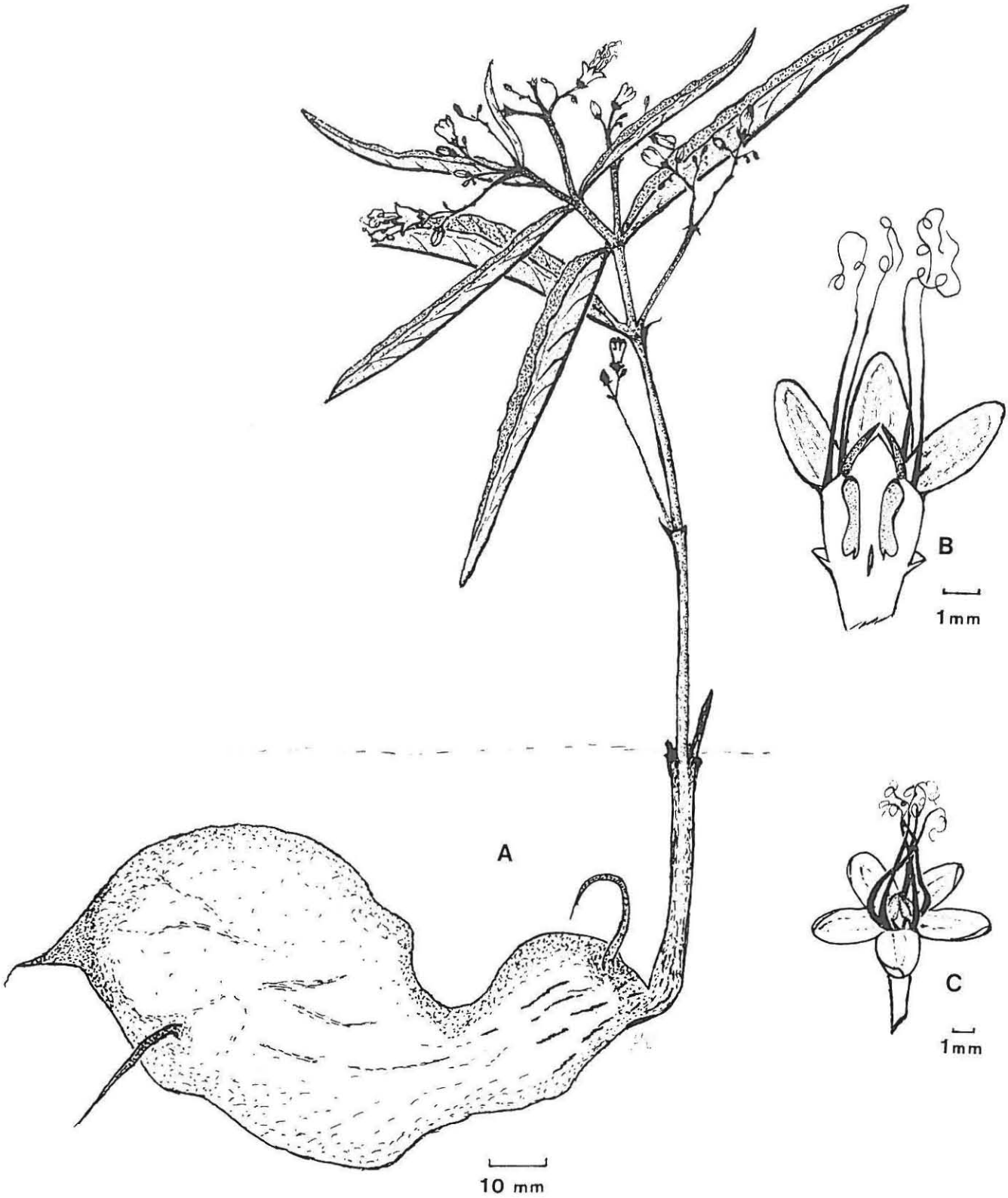

Figure 4 *Raphionacme moyalicus.* **A.** Plant with tuber, stems, leaves and flowers; **B.** part of opened flower revealing corolla, filiform corona lobes and gynostegium; **C.** flower with corolla lobes, filiform corona lobes and stamens visible.

ovoid, 1.0–1.2 × 0.7 mm, apex acute; *translators ca.* 1.0–1.2 mm long, spoon broadly angular ovate, 0.6 × 0.5 mm, stalk linear-terete, 0.6 mm long, adhesive disc orbicular. *Follicles* and *seeds* unknown. (Figures 1,2 & 4).

R. moyalicus is related to *R. arabica*, *R. borenensis*, and *R. michelii* in the fleshy, sub-conical staminal filaments and in the filiform corona lobes. *R. moyalicus* is distinguished from *R. borenensis* by its narrow leaves, laxiflorous inflorescences, smaller flowers and corona lobes twice as long as the corolla lobes. *R. moyalicus* is distinct from *R. arabica* by its narrow leaves and long, terminally entire corona lobes. *R. moyalicus* differs from *R. michelii* in its smaller flowers, longer corona lobes, small pollen tetrads and different, smaller translators. *R. moyalicus* is different from *R. abyssinica* in its erect plant form, corolla

colour, corona lobes which are long, free and filiform, and pollen in tetrads.

Distribution and ecology

The single, known specimen was collected at Moyale, Northern Frontier Province, in the escarp area of Kenya (Figure 3). It was found on a stony ridge in degraded mountain scrub. This vegetation includes, amongst others, species of *Cussonia, Ficus, Acacia, Dichrostachys, Combretum* and *Commiphora*.

Corrections

In Verhoeven & Venter (1988), an article on the pollen of *Raphionacme*, specimen *Gillett 14021* is listed under *R. abyssinica*. This specimen, however, must be regarded as representative of *R. moyalicus* in that article. In Venter & Verhoeven (1989) *Gillett 14021* is listed under *R. borenensis*. It must be deleted from that article.

Representative specimen

Kenya: —03°32′N,39°03′E: Moyale, Northern Frontier Province, *Gillett 14021* (K).

Acknowledgements

We thank the following institutions and persons: The University of the Free State, Bloemfontein, and the Foundation for Research Development, Pretoria, for their financial support of our revision of the Periplocaceae in Africa. The Kew Herbarium, London, for kind permission to study their material of *Raphionacme*. Mr. L.F. van Ryneveld, Department of Latin, University of the Free State, for translating the diagnosis into Latin.

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