

A new species of *Afrothismia* (Burmanniaceae, tribe Thismieae) from Korup National Park, Cameroon

Authors: Sainge, Moses N., Franke, Thassilo, and Agerer, Reinhard

Source: *Willdenowia*, 35(2) : 287-291

Published By: Botanic Garden and Botanical Museum Berlin (BGBM)

URL: <https://doi.org/10.3372/wi.35.35209>

BioOne Complete (complete.BioOne.org) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at www.bioone.org/terms-of-use.

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

MOSES N. SAINGE, THASSILO FRANKE & REINHARD AGERER

A new species of *Afrothismia* (*Burmanniaceae*, tribe *Thismiaceae*) from Korup National Park, Cameroon

Abstract

Sainge, M. N., Franke, T. & Agerer, R.: A new species of *Afrothismia* (*Burmanniaceae*, tribe *Thismiaceae*) from Korup National Park, Cameroon. – Willdenowia 35: 287-291. – ISSN 0511-9618; © 2005 BGBM Berlin-Dahlem.

doi:10.3372/wi.35.35209 (available via <http://dx.doi.org/>)

Afrothismia korupensis, a new species of this genus of achlorophyllous, myco-heterotrophic herbs is described from evergreen Guineo-Congolese rain forest in the Korup National Park, Cameroon, and illustrated. It differs from all other species of the genus in the internal structure of its perianth tube with six radially arranged cuneate partitions at the base, the absence of an internal flange and the laterally winged staminal filaments, each with a conical projection.

Introduction

All species of the small African genus *Afrothismia* Schltr. are achlorophyllous, myco-heterotrophic herbs, receiving essential nutrients from root colonizing fungi (Leake 1994, Cheek & Williams 1999, Imhof 1999). *Afrothismia* and the related genera *Thismia* Griff., *Haplothismia* Airy Shaw and *Oxygyne* Schltr. form a natural unit, which holds a still unclear phylogenetic position within the *Dioscoreales* (Caddick & al. 2000a-b, Caddick & al. 2002a-b, Angiosperm Phylogeny Group 1998, 2003). Since Agardh (1853), the leading view oscillates between treating them as a separate family (*Thismiaceae*) or as a tribe within the *Burmanniaceae* (*Thismiaceae*). According to the Angiosperm Phylogeny Group (2003), they are currently considered to be part of the *Burmanniaceae*.

Afrothismia is known to occur in at least six countries of tropical Africa, with the highest diversity in southwestern Cameroon.

While performing phenological research at the Korup Forest Dynamic Plot (KFDP), a new species of *Afrothismia* was discovered. KFDP is a 50 hectare transect of evergreen Guineo-Congolese rain forest, which was established by the Center for Tropical Forest Science (CTFS), in order to monitor the composition and demography of woody plants in a tropical forest (Thomas & al. 2003). The plot is located in the southern Korup National Park in Cameroon's South West Province, which shelters one of Africa's highest plant diversities and is also the type locality of the recently described *Afrothismia hydra* Sainge & T. Franke (Sainge & Franke 2005).

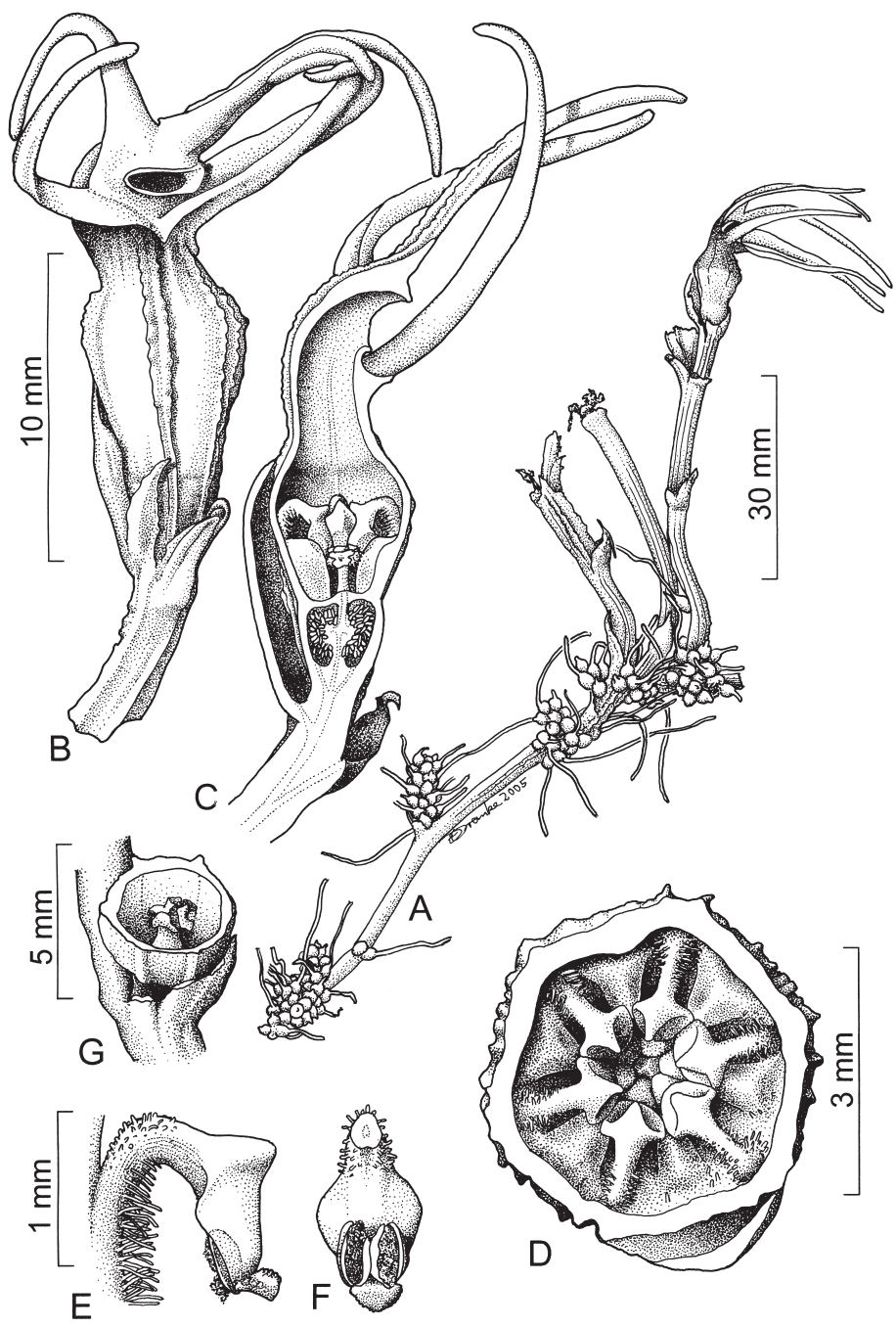


Fig. 1. *Afrothismia korupensis* – A: habit; B: flower; C: longitudinally sectioned flower, showing internal structures of perianth tube; D: transversely sectioned flower, showing arrangement of stamens; E: lateral view of stamen; F: ventral view of distal part of filament, anther and connective appendage; G: open fruit with stalked placentas (seeds lacking). – Drawn by T. Franke.

Until 2003 only three species and one variety of *Afrothismia* were published (Engler 1905, Schlechter 1906, Cowley 1988). In the following three years five new species were described and with the present contribution the number of species is tripled (Maas-van de Kamer 2003, Cheek 2003, Franke 2004, Franke & al. 2004, Sainge & Franke 2005).

***Afrothismia korupensis* Sainge & T. Franke, sp. nov.**

Holotypus: Cameroon, South West Province, Ndian Division, Southern Korup National Park, close to Chimpanzee Camp, Korup Forest Dynamic Plot (KFDP), 5°04'04"N, 8°51'21"E, c. 230 m, 9.7. 2002, *Sainge M. 991* (YA; isotypus: B) – Fig. 1.

Differt ab speciebus omnibus generis in structura interiore tubi perianthii cum 6 volvis longitudinalibus centrum tubi veines prominentibus, tubo sine limbo interio filamentis apiceus veines distincte dilatata, dorso processu conico provisus.

Dull white myco-heterotrophic herb. *Shoot* with clusters of proximally inflated roots and few scale-like leaves, epiterranean part distinctly ribbed and often branching, 25-120 mm long, 1-2 mm in diam.; *roots* with their proximally inflated part beige-coloured, tubercle-like, ellipsoid to ovoid, 1.2-1.7 mm long and 1-1.2 mm in diam.; distal elongated part whitish, up to 16 mm long and c. 0.3 mm in diam. *Scales* deltoid to triangular-lanceolate, 1.7-2.9(-4.4) × 2-3.3 mm (width measured at base). *Inflorescence* 1-2(-3)-flowered, flowers opening subsequently. *Floral bracts* deltoid, with two deep fissures at each side, therefore seemingly 3-lobed, 5.8-10 × 3.3-5.8 mm (width measured at base); floral bract and opposite scale forming an involucre-like structure. *Flowers* zygomorphic. *Perianth* basally fused, forming an upright, obpyriform tube with six free tepals; lower half of perianth tube and tepals white, upper half of perianth tube and area around mouth deep crimson. *Perianth tube* 10-12 mm long and 4.5-6.3 mm in diam. (at widest point), with six protruding veins, each crested with one or two knobbly ribs running from the base of the ovary to the proximal third of the tepals; lower part of tube obovoid, ± rugose to plicate, inner wall with six radially arranged, cuneate, fleshy processes, dividing the base into six cavities, each covered by a stamen; upper part of tube distinctly hood-shaped, inner wall smooth, without an internal flange; mouth circular to elliptic, oblique, with a white, protruding rim, 2.5-3.3 mm in diam. *Tepals* patent to slightly incurved, similar in shape and length, dorsiventrally flattened, narrow-lanceolate, 16-28 mm × 1.4-2 mm (width measured at the base); margins of adjacent tepals fused to each other c. 0.3 mm above point of insertion. *Stamens* six, inserted at the base of the perianth tube; proximal part of filaments c. 2.5 mm long, adnate to the perianth tube, ventrally densely pubescent; distal part of filaments free, c. 1.2 mm long and 0.4 mm in diam., reflexed, ventrally decreasingly pubescent to glabrous, dorsally papillose, distally provided with lateral, broadly deltoid wings and a dorsal fleshy, conical projection; anthers glabrous, c. 0.5 × 0.4 mm, distal connective appendage deltoid, dorsally papillose, firmly adnate to the stigmatic surface; thecae dehiscing longitudinally, half-way sunken into the fleshy connective, facing the perianth wall. *Ovary* unilocular, obovoid, 3.3-4.2 mm high and 3-3.3 mm in diam.; placentas 3, basally connate into a sterile central column; *style* glabrous, c. 0.7 mm long; stigma subspherical, densely papillose, c. 0.9 mm in diam., consisting of three stigmatic lobes fused to each other. *Fruit* a pyxidium, subspherical, 3.8-4.2 mm high and 3.3-3.8 mm in diam., sterile placental column not distended.

Etymology. – *Afrothismia korupensis* is named after the Korup National Park, where it was discovered.

Distribution and ecology. – *Afrothismia korupensis* is only known from the Korup National Park, where a small population of 12 individuals was discovered in 2002, growing in stony, very nutrient-poor soil on the floor of the evergreen Guineo-Congolese rain forest (for a comprehensive description of the vegetation see Thomas & al. 2003). The type locality is situated on a hill slope in the northeastern part of the Korup Forest Dynamic Plot (KFDP) at an altitude of c. 230 m. Rainfall in the area is high, exceeding an annual average of 5000 mm (Thomas & al. 2003). A

plant inventory of the type locality yielded the following woody plant species: *Amphimas ferrugineus* Pierre ex Pellegr., *Angylocalyx oligophyllus* (Bak.) Bak.f., *Araliopsis soyauxii* Engl., *Cola praeacuta* Brenan & Keay, *Deinbollia unijuga* D. W. Thomas, *Desbordesia glaucescens* (Engl.) Tiegh., *Diospyros preussii* Gürke, *Diospyros zenkeri* (Gürke) F. White, *Diogoia zenkeri* (Engl.) Exell & Mendonça, *Drypetes staudtii* (Pax) Hutch., *Hymenostegia afzelii* (Oliv.) Harms, *Klaineanthus gabonae* Pierre ex Prain, *Phyllanthus polyanthus* Pax, *Pierreodendron africanum* (Hook.f.) Little, *Strombosia pustulata* Oliv., *Symphonia globulifera* Linn.f., *Tapura africana* Oliv., *Trichoscypha patens* Engl., *Uapaca staudtii* Pax, *Xylopia aethiopica* (Dunal) A. Rich., *Zanthoxylum gillettii* (D. Wild.) P. G. Waterman.

Three specimens of *A. korupensis* were removed from the population in July 2002, almost at the peak of the rainy season. In June 2003 20 individuals were counted at the same spot. Other myco-heterotrophic herbs growing close by, were *Sciaphila ledermannii* Engl., *Burmannia hexaptera* Schltr. and *Gymnosiphon cf. longistylus* (Benth.) Hutch. & Dalziel.

Acknowledgements

This study was financially supported by the BIOLOG (Biodiversity and Global Change) programme (Grant 01LC0007) of the German Ministry of Education and Research (BMBF). The discovery of this remarkable new species would have been impossible without the support of the Center for Tropical Forest Science (CTFS) of the Smithsonian Tropical Research Institute and D. W. Thomas, G. B. Chuyong and D. Kenfack in particular. The authors are grateful for D. Podlech (Ludwig-Maximilians-Universität München) for preparing the Latin diagnosis and M. Cheek for reviewing a draft of the paper.

References

- Agardh, J. G. 1853: Theoria systematis plantarum. – Lund, etc.
- Angiosperm Phylogeny Group (APG) 1998: An ordinal classification for the families of flowering plants. – *Ann. Missouri Bot. Gard.* **85**: 531-553. [[CrossRef](#)]
- 2003: An update of the angiosperm phylogeny group classification for the orders and families of flowering plants: APG II. – *Bot. J. Linn. Soc.* **141**: 399-436. [[CrossRef](#)]
- Caddick, L. E. & Rudall, P. J. 2000a: Floral morphology and development in *Dioscoreales*. – *Feddes Repert.* **111**: 189-230.
- , —, Wilkin, P. & Chase, M. W. 2000b: Yams and their allies: systematics of *Dioscoreales*. – Pp. 475-487 in: Wilson, K. L. & Morrison, D. L. (ed.), *Monocotyledons: systematics and evolution*. – Melbourne.
- , Rudall, P. J., Wilkin, P., Hedderson, T. A. J. & Chase, M. W. 2002a: Phylogenetics of *Dioscoreales* based on combined analyses of morphological and molecular data. – *Bot. J. Linn. Soc.* **138**: 123-144. [[CrossRef](#)]
- , Wilkin, P., Rudall, P. J., Hedderson, T. A. J. & Chase, M. W. 2002b: Yams reclassified: A recircumscription of *Dioscoreaceae* and *Dioscoreales*. – *Taxon* **51**: 103-114. [[CrossRef](#)]
- Cheek, M. 2003: A new species of *Afrothismia* (*Burmanniaceae*) from Kenya. – *Kew Bull.* **58**: 951-955. [[CrossRef](#)]
- & Williams, S. 1999: A review of African saprophytic flowering plants. – Pp 39-49 in: Timberlake, J. & Kativu, S. (ed.), *African plants: biodiversity, taxonomy & uses*. Proceedings of the 1997 AETFAT congress, Harare, Zimbabwe. – Kew.
- Cowley, E. J. 1988: *Burmanniaceae*. – Pp 1-9 in: Polhill, R. M. (ed.), *Flora of Tropical East Africa*. – Rotterdam & Brookfield.
- Engler, A. 1905: *Thismia winkleri* Engl., eine neue afrikanische *Burmanniaceae*. – *Bot. Jahrb. Syst.* **38**: 89-91.
- Franke, T. 2004: *Afrothismia saingei* (*Burmanniaceae*), a new myco-heterotrophic plant from Cameroon. – *Syst. Geogr. Pl.* **74**: 27-33.

- , Sainge, M. N. & Agerer, R. 2004: A new species of *Afrothismia* (*Burmanniaceae*; tribe *Thismieae*) from the western foothills of Mt. Cameroon. – *Blumea* **49**: 451-456.
- Imhof, S. 1999: Anatomy and mycotrophy of the achlorophyllous *Afrothismia winkleri*. – *New Phytol.* **144**: 533-540. [[CrossRef](#)]
- Leake, J. J. 1994: The biology of myco-heterotrophic (“saprophytic”) plants. – *New Phytol.* **127**: 171-216. [[CrossRef](#)]
- Maas-van de Kamer, H. 2003: *Afrothismia gesnerioides*, another new species of *Afrothismia* (*Burmanniaceae*) from tropical Africa. – *Blumea* **48**: 475-478.
- Sainge, M. N. & Franke, T. 2005: A new species of *Afrothismia* (*Burmanniaceae*) from Cameroon. – *Nordic J. Bot.* **23**: 299-303.
- Schlechter, R. 1906: *Burmanniaceae* africanae. – *Bot. Jahrb. Syst.* **38**: 137-143.
- Thomas, D. W., Kenfack, D., Chuyong, G. B., Sainge, M. N., Losos, E. C., Condit, R. S. & Songwe, N. 2003: Tree species of southwestern Cameroon: Tree distribution maps, diameter tables, and species documentation of the 50-hectare Korup Forest Dynamic Plot. – Washington, D.C.

Addresses of the authors:

Moses N. Sainge, Korup Forest Dynamic Program, Korup National Park, P.O. Box 36, Mundemba, South West Province, Republic of Cameroon.

Thassilo Franke & Reinhard Agerer, Department Biology I and GeoBio-Center, Ludwig-Maximilians-University, Biodiversity Research: Systematic Mycology, Menzinger Str. 67, D-80638 München, Germany; e-mail: thassilo.franke@web.de