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RESEARCH ARTICLE

A new species of *Amorphophallus* (Araceae) from Eastern D.R. Congo, and a new record of the genus from Rwanda

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Abstract

Background and aims – A new species of *Amorphophallus* (Araceae) is described from D.R. Congo in connection with preparing the family treatment for the Flore d'Afrique centrale. Another species is recorded for the first time from Rwanda.
Methods – Standard herbarium practices were applied.
Key results – *Amorphophallus dumboi* sp. nov. is related to *A. margretae*. The differences between these species are discussed and distribution maps for the taxa are presented. Both species are range-restricted in the Albertine Rift and preliminarily assessed as Critically Endangered. *Amorphophallus mayoi* is for the first time recorded for Rwanda. The taxon, originally described as a subspecies of *A. calabaricus*, is raised here to specific rank.

Keywords

Albertine Rift, *Amorphophallus dumboi*, *Amorphophallus mayoi*, Central Africa, endemism, taxonomy

INTRODUCTION

The genus *Amorphophallus* Blume ex Decne. (Araceae, Thomsonieae) comprises ca 230 species and is distributed in tropical and southern Africa, Madagascar, tropical and subtropical Asia to Western Australia (Claudel et al. 2017). A total of 31 species are recorded from continental Africa, and eight from Madagascar (Ittenbach 2003; Hetterscheid and Claudel 2014). For the Flore d'Afrique centrale (D.R. Congo–Rwanda–Burundi), the family Araceae has not yet been treated, but recent revisions of the genus *Amorphophallus* for Africa and Madagascar are available (Ittenbach 2003; Hetterscheid and Claudel 2014). There are 14 taxa recorded for the Democratic Republic of the Congo and one (*Amorphophallus lewallei* Malaisse & Bamps; Malaisse and Bamps 1993: 175) for Burundi. The latter is restricted to the Rusizi plain around Bujumbura and is assessed as Critically Endangered (CR) and possibly extinct (Ntore et al. 2018). Only few species are widespread in D.R. Congo, while most taxa are just known from few collections or even only from the type. *Amorphophallus abyssinicus* (A.Rich.) N.E.Br. (Richard 1850: 352; Brown 1901: 160) is represented by *A. abyssinicus* subsp. *abyssinicus* in the phytogeographical districts of Kasai, Forestier Central, Ubangi-Uele, Lac Albert, and Haut Katanga (names of phytogeographical districts after Robyns in Bamps 1982), while *A. abyssinicus* subsp. *unyikae* (Engl. & Gehrm.) Ittenb. (Engler 1911: 72; Ittenbach 2003: 81) is only found in Haut Katanga. *Amorphophallus angolensis* (Welw. ex Schott) N.E.Br. (Schott 1865: 35; Brown 1901: 156) occurs with *A. abyssinicus* subsp. *angolensis* in Bas Katanga and Forestier Central, and *A. abyssinicus* subsp. *maculatus* (N.E.Br.) Ittenb. (Brown 1901: 155; Ittenbach 2003: 90) in Bas Congo and Forestier Central. *Amorphophallus bequaertii* De Wild. (De Wildeman 1921: 174) is just known from two localities (Semliki in Forestier Central, May ya Moto in the Lacs Edouard et Kivu-District), *A. calabaricus* N.E.Br. (Brown 1901: 155) subsp. *mayoi* Ittenb. (Ittenbach and Lobin 1997: 159) from Yangambi (Forestier Central) and the montane forests of Uganda and western Kenya (see below), and *A. eichleri* (Engl.)

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Hook.f. (Engler 1883: 285; Hooker 1889: t. 7091) from the border to Angola (Ittenbach 2003). The Eastern African *Amorphophallus goetzei* (Engl.) N.E.Br. (Engler 1900: 355; Brown 1901: 150) just reaches Haut Katanga, where it was described as *A. petitianus* Malaisse & Bamps (Malaisse and Bamps 1993). *Amorphophallus hetterscheidii* Ittenb. & Lobin (Ittenbach and Lobin 1997: 152) is only known from Gabon and two localities in western D.R. Congo (Kasai), *A. mossambicensis* (Schott) N.E.Br. (Schott 1860: 132; Brown 1901: 150) is recorded in Central Africa from Kasai, *A. margretae* Ittenb. (Ittenbach and Lobin 1997: 156) from Forestier Central (Irangi), *A. mullendersii* Malaisse & Bamps (Malaisse and Bamps 1993: 176) from Kasai and Haut Katanga, *A. stuhlmannii* (Engl.) Engl. & Gehrm. (Engler 1905: 152; Engler 1911: 81) subsp. *congoensis* (A.D.Hawkes) Ittenb. (Hawkes 1951: 98; Ittenbach 2003: 226) only from the type from Lukolela (Forestier Central), and *A. teuszii* (Engl.) Mottet (Engler 1884: 2, t. 1142; Mottet 1892: 137) from two localities near the border to Angola in Kasai (Ittenbach 2003). Thus, *Amorphophallus lewallei* is endemic to Burundi, and *A. bequaertii*, *A. eichleri*, *A. margretae*, *A. mullendersii*, *A. stuhlmannii* subsp. *congoensis*, and *A. teuszii* are considered as endemics of the Democratic Republic of the Congo. No species of *Amorphophallus* has so far been recorded from Rwanda.

During recent fieldwork in Rwanda and the Eastern Democratic Republic of the Congo, two species could be observed. The one from Rwanda proved to be *Amorphophallus calabaricus* subsp. *mayoi* and thus constitutes a new country record, while the other taxon from Kahuzi-Biéga National Park could not be identified. After careful comparison with herbarium material and the relevant literature, it proved to be a species new to science that is described below.

MATERIAL AND METHODS

The present study is based on the investigation of living plants and dried herbarium specimens from the following herbaria: BR and K (acronyms according to Thiers continuously updated). Inflorescences were fixed in 70% ethanol to obtain details and measurements. The information about the habitat of the involved species, as well as their phenology and chorology were based on field observations. The majority of specimens studied can be consulted online from BR (https://www.botanicalcollections.be) and K (http://apps.kew.org/herbcat). Finally, the IUCN Red List Categories and Criteria (IUCN 2012, 2022) were applied to evaluate the conservation status of the new species and of *A. margretae* and *A. mayoi* comb. et stat. nov.

RESULTS AND DISCUSSION

New species of *Amorphophallus* from D.R. Congo

Amorphophallus dumboi Eb.Fisch., B.Dumbo & L.Dumbo, **sp. nov.**
urn:lsid:ipni.org:names:77304007-1
Figs 1–2, 5A; Table 1

Type. D.R. CONGO – **Lacs Edouard et Kivu** • S Kivu, Kahuzi-Biéga National Park, transitional rainforest at Mulolo, partially submerged along small stream; 2°29'06.42"S, 28°21'22.09"E; 1108 m; Dec. 2018; *B. Dumbo & L. Dumbo s.n.*; holotype: BR [BR0000015253569V].

Diagnosis. *Amorphophallus dumboi* differs from *A. margretae* in the leaves and inflorescences that appear at the same time on the same tuber (leaves appear after inflorescence in *A. margretae*), the peduncle about 4 times the length of the spathe (peduncle not exceeding 2 times the length of the spathe in *A. margretae*), and the inner base of spathe with irregular rounded to elongate smallpox-like projections of 0.2–1 mm in length, between and on the veins (inner base of spathe smooth, with shallowly elevated dark veins in *A. margretae*).

Description. Tuber irregular-globose to ovoid, 6–8 × 2.5–5.5 cm. Leaf with 3 pinnae, each 1-pinnate to 1-pinnatifid. Petiole 70–75 cm long. Lamina diameter up to 120 cm. Rachis of each pinna 35–37 (48) cm long, winged. Terminal leaflet up to 16.5 cm long and 4.5 cm wide, with long acumen of 2.5 cm length. Cataphylls 3, the inner one ca 9–10 × 1.5–2 cm, the outer ones much shorter, dark with darker veins. Inflorescence up to 125 cm tall, erect, appearing simultaneously on the same bulb with the leaf, smell very unpleasant. Peduncle smooth, 90–98(–105) cm × 1.5 cm, with small roundish spots. Spathe 18–25.5 (30) cm long, cylindrical, without a constriction, tube 11–12(–15) × 5.8–6.2 cm, interior (adaxial) side basally with irregular rounded to elongate smallpox-like projections of 0.2–1 mm length, between and on the veins, open limb erect, rim-shaped to elongate-triangular 15–16 × 6–8 cm, purple, margin entire. Spadix sessile, 25.5–32.5(–38) cm long, slightly longer than spathe, carpellate zone cylindrical, 2.5–5.2 × 2.5–2.8 cm, flowers mostly congested, staminate zone cylindrical, 4.8–5.3 × 2.5–2.8, flowers dense, appendix conical, 16–18 × 3.8–5 cm, smooth and velvet-like, basally with longitudinal furrows, staminodes absent, without a sterile zone between the carpellate and staminate zone. Carpellate flowers 4–4.6 mm long, ovaries elongate-ovoid, 3.5–4 × 3–4 mm, unilocular, style slender, 1–1.2 mm long, same colour as ovary, stigma 1.2–1.3 mm in diameter, usually unlobed and head-shaped. Staminate flowers 1–1.5 × 1.3–2.24 mm, with 3–4 stamens; anthers free, globose to cubic with rounded edges, filaments only 0.1–0.3 mm long, free or sometimes basally connate but not forming a columna,

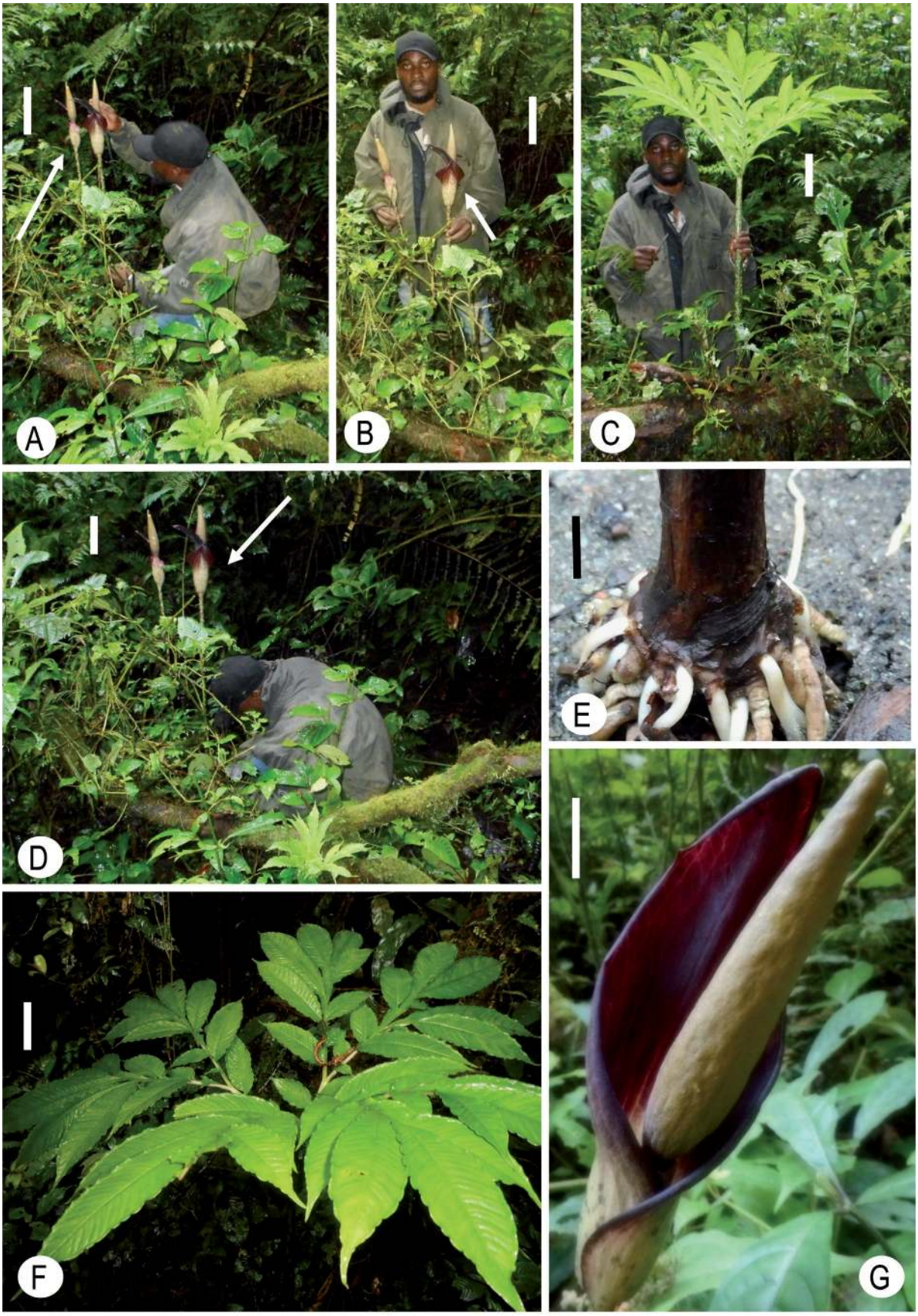


Figure 1. *Amorphophallus dumboi*. **A**–**B**, **D**. Habit with inflorescences showing the third author for comparison. **C**. Leaf, showing the third author for comparison. **E**. Base of plant showing roots and upper part of tuber. **F**. Leaf. **G**. Inflorescence. Scale bars: 20 cm (A–D), 1 cm (E), 5 cm (F–G). Photographs taken at the type locality on 10 Dec. 2018 by Bonny Dumbo.

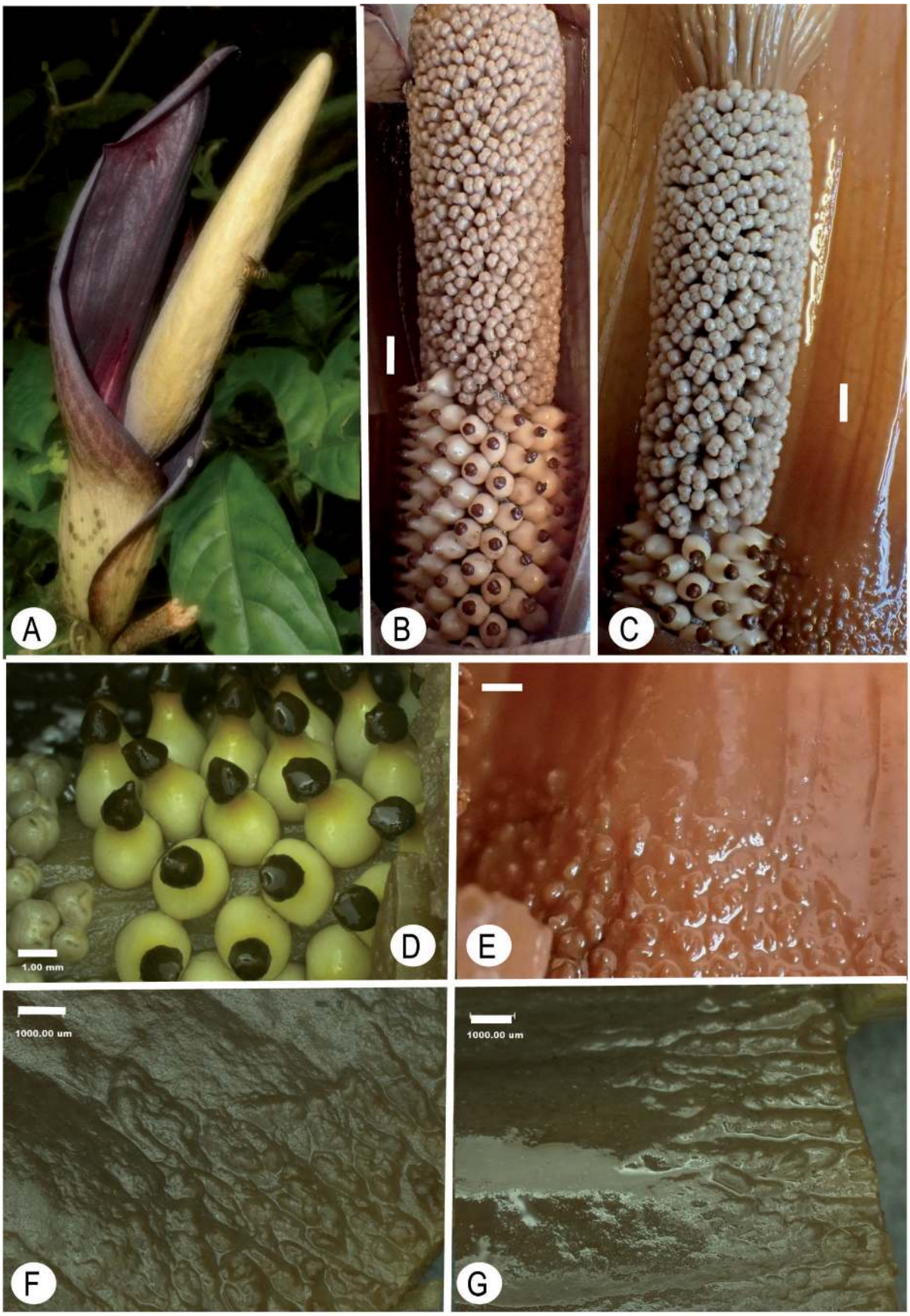


Figure 2. *Amorphophallus dumboi*. **A**. Inflorescence. **B–C**. Detail of spadix showing staminate (above) and carpellate zone (below). **D**. Carpellate flowers. **E–G**. Ornamentation on inner side of spathe. Scale bars: 5 cm (A), 5 mm (B–C), 1 mm (D–G). Photographs taken at the type locality on 10 Dec. 2018 by Bonny Dumbo (A), and in the laboratory by Eberhard Fischer (B–G).

Table 1. Comparison of the key characters for *Amorphophallus dumboi* and *A. margretae*.

Character	*Amorphophallus dumboi*	*Amorphophallus margretae*
Leaves	**appearing together with inflorescence on same tuber**	appearing after inflorescences
Inflorescence (cm)	**125**	78–82
Peduncle length (cm)	**90–98(–15) × 1.5**	50–52 × 0.6–1
Spathe length (cm)	18–25.5 (30)	24
Tube shape	cylindrical, not constricted	elongate-cylindrical, slightly constricted
Tube size (cm)	**11–12(–15) × 5.8–6.2**	8.5–9 × 3.5–4
Basal inside of tube	**irregular rounded to elongate projections of 0.2–1 mm length, between and on the veins**	**smooth, with shallowly elevated dark veins**
Open limb	15–16 × 6–8 cm, purple, margin entire	14.5–15 × 6–7 cm, purple, margin slightly undulate
Spadix	sessile, 25.5–32.5(–38) cm, slightly longer than spathe	sessile, 28–30 cm, slightly longer than spathe
Carpellate zone	**cylindrical, 2.5–5.2 × 2.5–2.8 cm, mostly congested**	cylindrical, 3 × 1.5 cm, flowers distant, only partly congested
Staminate zone	**cylindrical, 4.8–5.3 × 2.5–2.8 cm, flowers dense**	cylindrical, 7–8 × 0.6–1 cm, flowers distant
Sterile zone	Absent	Absent
Appendix	**conical, 16–18 × 3.5–5 cm, smooth, basally with longitudinal furrows**	conical, 16–17 × 0.6–2 cm, smooth, basally slightly constricted
Carpellate flowers length (mm)	4–4.6	5–6
Ovary (mm)	3.5–4 × 3–4	elongate-ovate, 3–4.5 × 2–3
Style (mm)	**1–1.2**	0.6-1
Stigma (mm)	**1.2–1.3**	2-humped or unlobed, 0.5–0.8 × 0.5
Staminate flowers (mm)	1–1.5 × 1.3–2.24	0.8–1 × 0.8–1.1
Anthers (mm)	free, rounded to cubic	free, rounded to cubic
Filament length (mm)	0.1–0.2	0.1–0.3

pores circular, one apical pore per theca. Infructescence unknown.

Distribution. Only known from the rainforests in the southern part of Kahuzi-Biéga National Park, Eastern Democratic Republic of the Congo (Fig. 5A).

Habitat. Transitional montane rainforest at Mulolo, partially submerged along small stream, 1108 m, together with numerous ferns and *Impatiens* species.

Phenology. Observed in flower from August to April.

Etymology. Named after Dumbo Kilundo (1 January 1930–18 September 2020), one of the most knowledgeable botanists from D.R. Congo, despite that he never received formal training. Born in Kisanga (Mulolo), Shabunda, he went to the Institut de Recherche Scientifique en Afrique Centrale (IRSAC) at Lwiro, today Centre de Recherche en Sciences Naturelles (CRSN). There he worked first with A.R. Christiaensen and later with G. Troupin. He made major contributions to the knowledge of the Flora of Central Africa, first for the IRSAC, later as Head of Irangi Forest Reserve and for the Herbarium of Lwiro.

Preliminary IUCN conservation assessment. Critically Endangered: CR B2ab(iii). *Amorphophallus dumboi* is only known from the type locality. The estimated AOO is 4 km² (assuming a 4 km² grid cell size). The habitat, a submontane rainforest, is under potential threat of illegal logging but is actually protected as part of Kahuzi-Biéga National Park.

Amorphophallus margretae Ittenb. (Ittenbach and Lobin 1997: 156)

Fig. 5A; Table 1

Type. D.R. CONGO – **Forestier Central** • Kivu, Terr. Kalehe, km 110 route Kavumu–Walikale, réserve IRSAC à Irangi, riv. Fulonko; 900 m; 6 Dec. 1956; *Christiaensen 1918*; holotype; BR [BR0000008261137].

Habitat. Dense rainforest in the water of the river [Forêt ombrophile dense dans l'eau de la rivière].

Preliminary IUCN conservation assessment. Critically Endangered: CR B2ab(iii) (possibly extinct). *Amorphophallus margretae* is only known from the type locality. The estimated AOO is 4 km² (assuming a 4 km² grid cell size). The habitat, a submontane rainforest, is under threat of illegal logging, and most of the area of the former Irangi Forest Reserve has been completely logged. Thus, the species might already be extinct.

Taxonomic notes for *A. dumboi* and *A. margretae*

Amorphophallus dumboi is one of the few species in the genus recorded from the Albertine Rift in Eastern D.R. Congo. The only other species known from that area is *Amorphophallus margretae*, which has been recorded only from the type locality in the former Irangi Forest Reserve. The first author could collect a specimen from this area in 1991, and study the vegetation (Fischer 1996). *Amorphophallus margretae* occurs on the forest floor in a *Gilbertiodendron dewevrei-Cynometra alexandri* rainforest near a stream and grows also in the water of a stream according to the collector of the type specimen A.R. Christaensen ("forêt ombrophile dans l'eau de la rivière"). Observations in the field and in cultivation at the Botanical Gardens of the University of Bonn revealed that it has, like most other species, a pronounced dormancy, confirmed also by A.R. Christiaensen ("herbe en fleurs, feuille absente"). The leaves appear after flowering and are only visible in March to April or October to December. Unfortunately, the individual in cultivation did not survive, and was also not documented as a voucher. Moreover, the forest at the type locality has now been logged. Thus, *Amorphophallus margretae* is considered as Critically Endangered (CR), possibly extinct. *Amorphophallus dumboi* grows in an inundated rainforest close to a stream. Observations at the type locality showed that it has no dormancy, and that inflorescences and leaves are present at the same time on one single tuber. The population of *Amorphophallus dumboi* has been visited four times and there have always been inflorescences and developed leaves on one single bulb. In the only known specimen of *Amorphophallus margretae* only the inflorescence with bulb is present indicating a marked dormancy. This is confirmed by a personal observation of the first author at the type locality at Irangi who recorded only leaves without inflorescences. Ittenbach (2003) showed that the basal inner (adaxial) side of the spathe is of special diagnostic value. He could distinguish 12 types of sculpture from verrucate or covered with hairy emergences to elevated veins or parallel ribs. *Amorphophallus gallaensis* and *A. margretae* have typical elevated veins that are usually dark. *Amorphophallus dumboi* has a unique kind of sculpture at the basal inner side that has not been described by Ittenbach (2003). It consists of irregularly rounded to elongate smallpox-like projections that have the same colour as the surrounding spathe interior. They are arranged longitudinally along and between the veins (Fig. 2).

First record of *Amorphophallus* for Rwanda

Amorphophallus mayoi (Ittenb.) Eb.Fisch., B.Dumbo & L.Dumbo, **comb. et stat. nov.**
urn:lsid:ipni.org:names:77304008-1
Figs 3–5

Amorphophallus calabaricus N.E.Br. subsp. *mayoi* Ittenb., Willdenowia 27(1–2): 159. 1997. (Ittenbach and Lobin 1997: 159)

Type. UGANDA – **U4** • Mengo Distr., Kajansi Forest Reserve, 16 m on road to Entebbe; April 1938; *Chandler 2433;* holotype: K [K000609683, K000609684].

Additional specimens studied. D.R. CONGO – **Forestier Central** • à 8 km à l'ouest du Village Yakombe (route Yangambi–Gazi), forêt secondaire lianeuse à l'emplacement d'un ancient village appelé "Elongo", endroit clairièré; 9 May 1940; *Germain 340*; BR [BR0000019942988] • Yangambi; Mar. 1949; *Germain 4768*; BR [BR0000019942995].

RWANDA – **Lacs Edouard et Kivu** • Western Province, Nyungwe National Park, Cyamudongo Forest, near Nyakabuye River; 1801 m; 1 Nov. 2019; *B. Dumbo & M. Harbusch s.n.;* KOBL.

UGANDA – **U2** • Bunyoro Distr., Budongo Forest; 28 June 1972; *Synnott 1080*; K • ibid.; Oct. 2005; *Fischer & Killmann s.n.*; KOBL • Mbale District, 10 km N of Busia, Oruchor Hill; 4 May 1951; *Wood 257*; K.

KENYA – **K5** • N Kavirondo Distr., Kakamega Forest; 12 Apr. 197; *O.J.Hansen 921*; K, EA • ibid.; Oct. 2005; *Fischer & Killmann s.n.*; KOBL.

Habitat. Closed canopy montane rainforest with dominating *Newtonia buchananii* (Baker) G.C.C.Gilbert & Boutique and *Entandrophragma excelsum* Sprague at 1801 m a.s.l.

Preliminary IUCN conservation assessment. *Amorphophallus mayoi* is widespread and known from at seven localities, four of them under protection as Forest Reserve or National Park. It is assessed here as Vulnerable (VU B1a2a).

Taxonomic notes. The leaves of a small *Amorphophallus* were discovered in 2016 during a botanical inventory of Cyamudongo Forest, a small isolated remnant forest of ca 300 ha that is protected as part of Nyungwe National Park. At the end of October 2019, a young inflorescence was discovered and it was subsequently identified as *Amorphophallus calabaricus* subsp. *mayoi*. This subspecies was originally described from Uganda, Kenya, and D.R. Congo, but had never been recorded for Rwanda. It is morphologically distinct from *Amorphophallus calabaricus* subsp. *calabaricus* that has a dark brown-purple upper spathe, a dark purple appendix that is at least 2 times as long as the spathe, and a longitudinal relation of carpellate and staminate area of 0.65 to 0.75. *Amorphophallus calabaricus* subsp. *mayoi* has an olive-green upper spathe, an olive-green to yellowish appendix that is not exceeding 1.5 of the length of spathe, and a relation of carpellate to staminate area of 0.7 to 1.3. While *A. calabaricus* subsp. *calabaricus* is restricted to coastal Nigeria and Cameroon in lowland rainforests of 50 to 500 m, *A. calabaricus* subsp. *mayoi* is found in Eastern D.R. Congo (Yangambi), Western Uganda (Budongo Forest, Entebbe), and Western Kenya (Kakamega Forest) in submontane to montane forests from 470 to 1801 m. These morphological, geographical, and ecological

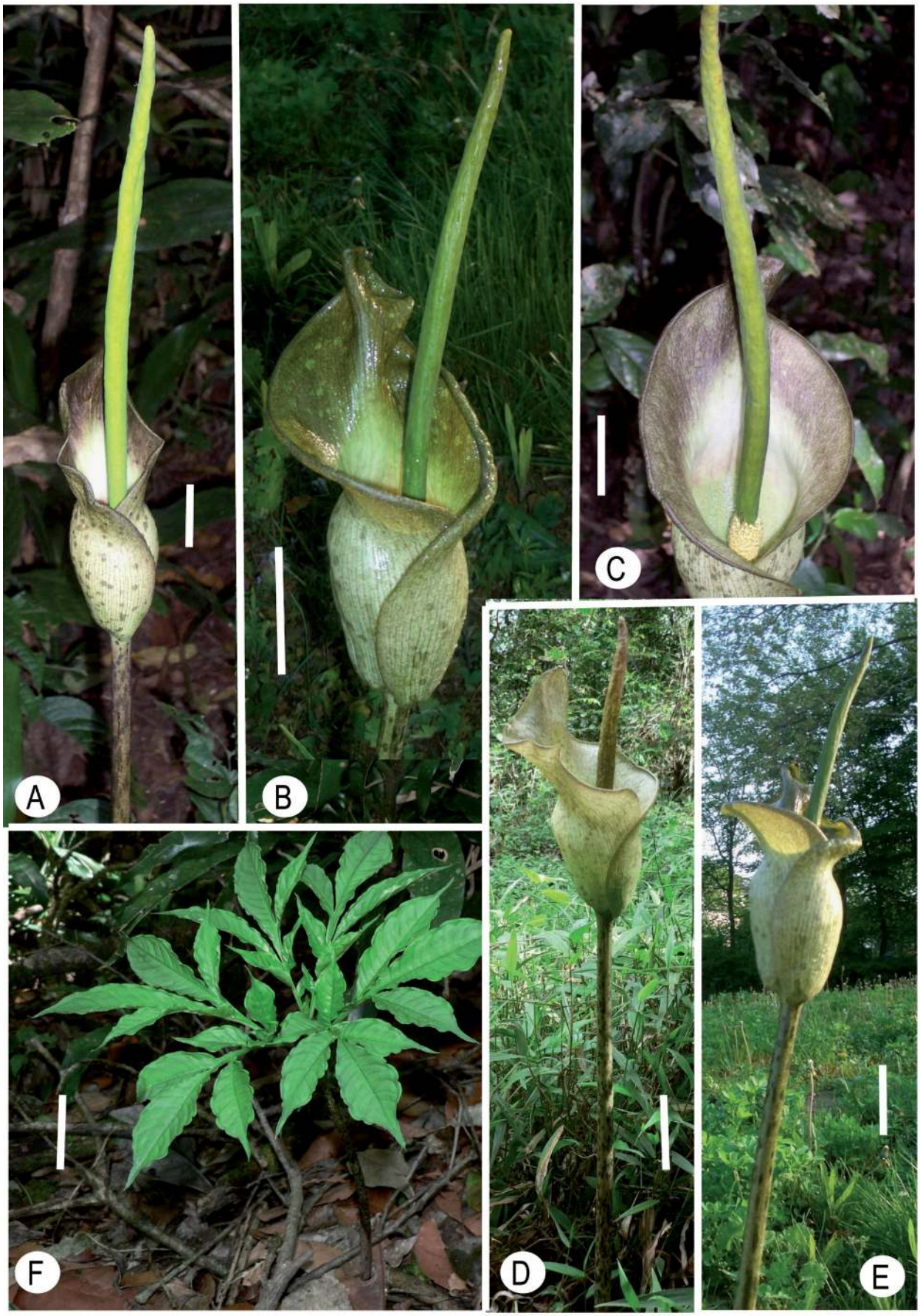


Figure 3. *Amorphophallus mayoi*. **A**–**E**. Inflorescences. **F**. Leaf. Scale bars: 5 cm (A, C–E), 10 cm (B). Photographs taken by Eberhard Fischer at Kakamega Forest in February 2007 (A, C–D) and on 10 Apr. 2009 (F), and at Budongo Forest in February 2006 (B).

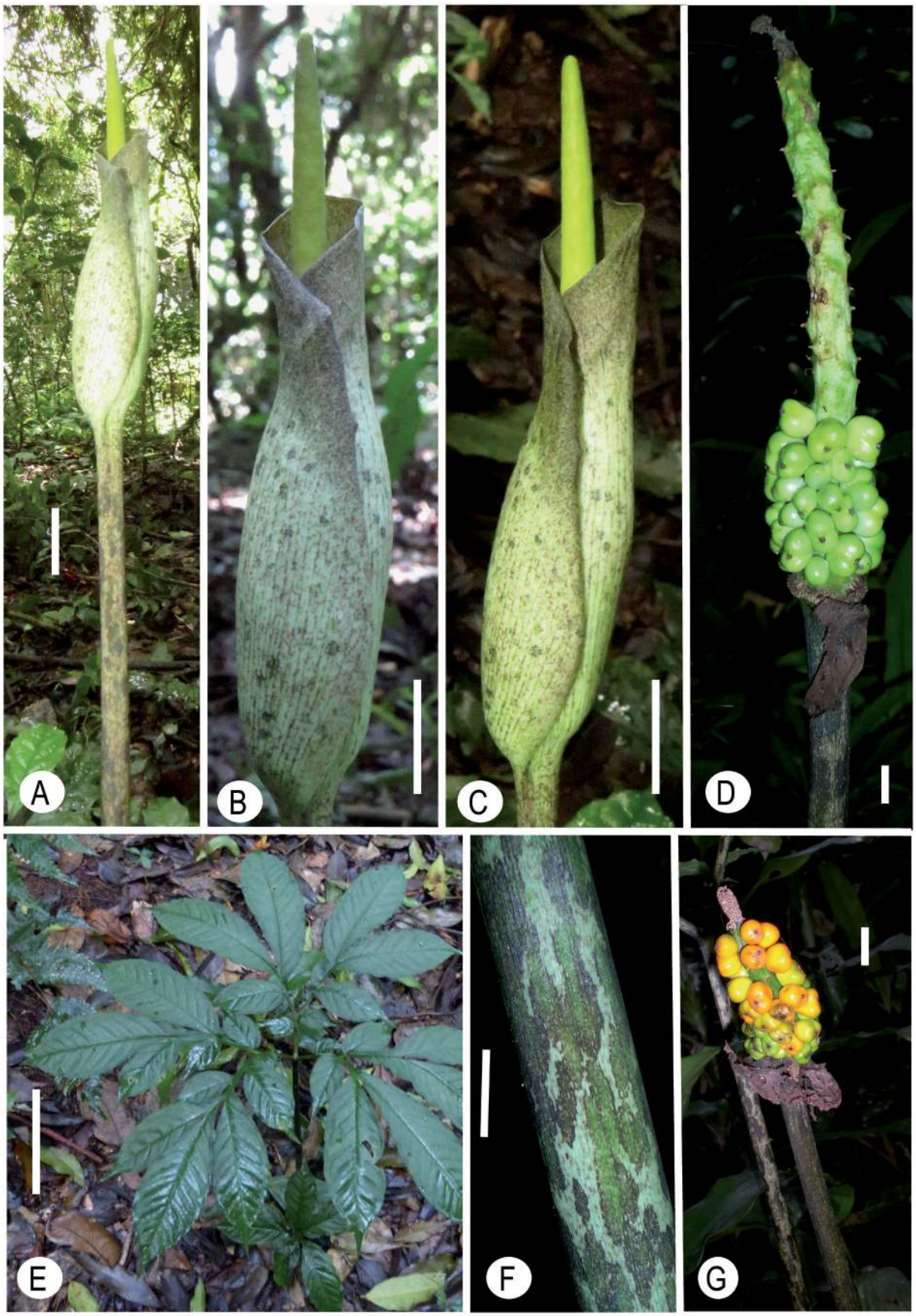


Figure 4. *Amorphophallus mayoi*. **A**–**C**. Inflorescences. **D**, **G**. Infructescences. **E**. Leaf. **F**. Detail of petiole. Scale bars: 5 cm (A–C), 1 cm (D, F–G), 10 cm (E). Photographs taken at Cyamudongo Forest on 1 Nov. 2019 by Bonny Dumbo (A–C) and on 31 Dec. 2017 by Eberhard Fischer (E), and at Budongo Forest on 11 Oct. 2005 by Eberhard Fischer (D, F–G).

differences seem sufficient to consider *Amorphophallus calabaricus* subsp. *mayoi* as a species of its own. *Amorphophallus mayoi* is recorded here for the first time for Rwanda. The plant produces inflorescences at the end of October to November, and the leaves are shed at the end of November and last until March. A pronounced dormancy is observed from April to October. As the only hitherto published illustration is a reproduction of the herbarium specimen *Wood 257* (Ittenbach 2003), we provide pictures from the two main localities (Budongo Forest, Uganda and Kakamega Forest, Kenya) showing full developed inflorescences (Figs 3, 4). The type at Kew consists of two sheets (sheet I, sheet II) under the number *Chandler 2433* (K000609683, K000609684). There is a third specimen under this collector number *Chandler 2433* (K000609685) from April 1939 and the original collector number is crossed out and Nr. *2433* is added. Thus, sheet III is not part of the type collection but was collected on the same place one year later.

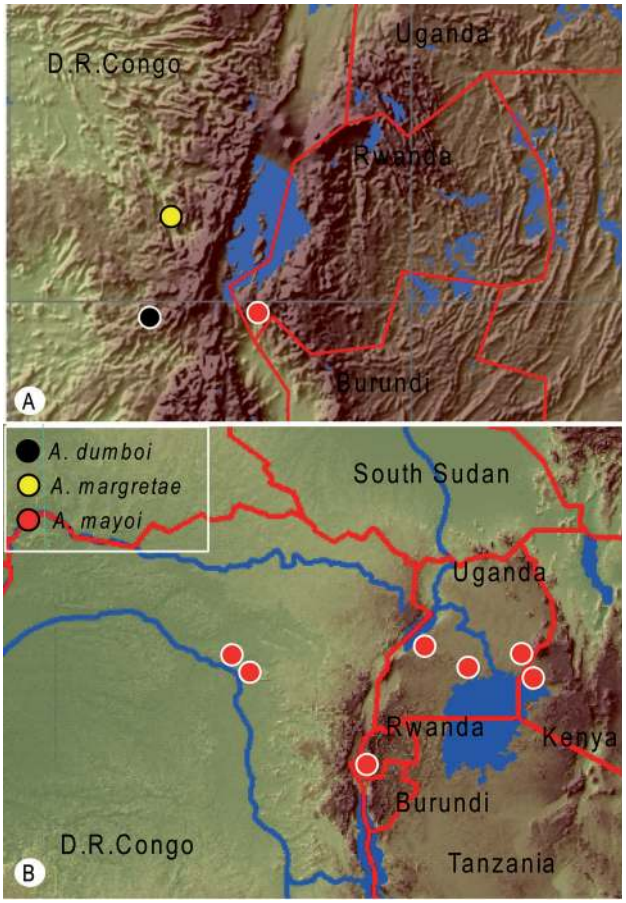


Figure 5. A. Distribution map of *Amorphophallus dumboi*, *A. margretae*, and *A. mayoi* in D.R. Congo and Rwanda. **B**. Distribution map of *A. mayoi*.

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REFERENCES

Bamps P (1982) Flore d'Afrique centrale (Zaïre – Rwanda – Burundi). Répertoire des Lieux de Récolte. Jardin botanique national de Belgique, 1–224.

Brown NE (1901) Aroideae. In: Thiselton-Dyer WT (Ed.) Flora of Tropical Africa 8: 144–160. London.

Claudel C, Buerki S, Chatrou L, Antonelli A, Alvarez N, Hetterscheid WLA (2017) Large-scale phylogenetic analysis of *Amorphophallus* (Araceae) derived from nuclear and plastid sequences reveals new subgeneric delineation. *Botanical Journal of the Linnean Society* 184: 32–45. https://doi.org/10.1093/botlinnean/box013

De Wildeman E (1921) Plantae Bequaertianae I. Ghent.

Engler A (1883) *Hydrosme eichleri* n. sp. Jahrbuch des Königlichen Botanischen Gartens und des Botanischen Museums zu Berlin 2: 285–286.

Engler A (1884) *Hydrosme teucszii* Engl. Gartenflora 33: 2–3.

Engler A (1900) Araceae. In: Engler A (Ed.) Die von W. Goetze und Dr. Stuhlmann im Uluguru-Gebirge, sowie die von W. Goetze in der Kisaki- und Khutu-Steppe und in Uhehe gesammelten Pflanzen. Botanische Jahrbücher fur Systematik, Pflanzengeschichte und Pflanzengeographie 28: 355–356.

Engler A (1905) Neue afrikanische Arten aus verschiedenen Familien. Botanischer Jahrbücher fur Systematik, Pflanzengeschichte und Pflanzengeographie 34: 151–160.

Engler A (1911) Araceae – Lasioideae. In: Engler A (Ed.) Das Pflanzenreich. Regni Vegetabilis Conspectus IV, 23C: 1–130. Wilhelm Engelmann, Leipzig.

Fischer E (1996) Die Vegetation des Parc National Kahuzi-Biéga/Zaïre. Erdwissenschaftliche Forschung 35: 1–240. Akademie der Wissenschaften und der Literatur. Franz Steiner Verlag, Stuttgart.

Hawkes AD (1951) Studies in Araceae I. Lloydia 14: 98–100.

Hetterscheid WLA, Claudel C (2014) Endemic *Amorphophallus* (Araceae) from Madagascar: a revised key, a new species and molecular phylogeny. Botanical Studies 55: 2. https://doi.org/10.1186/1999-3110-55-2

Hooker JD (1889) *Amorphophallus eichleri*. Botanical Magazine 115: t. 7091.

IUCN (2012) IUCN Red List Categories and Criteria. Version 3.1. Second edition. https://www.iucn.org/content/iucn-red-list-categories-and-criteria-version-31-second-edition [accessed 30.05.2022]

IUCN (2022) Guidelines for using the IUCN Red List Categories and Criteria. Version 15. https://www.iucnredlist.org/resources/redlistguidelines [accessed 30.05.2022]

Ittenbach S (2003) Revision der afrikanischen Arten der Gattung *Amorphophallus* (Araceae). Englera 25: 1–263. https://doi.org/10.2307/3776772

Ittenbach S, Lobin W (1997) Notes on the genus *Amorphophallus* (Araceae) – 6. Six new species and two new subspecies from Africa. *Willdenowia* 27(1–2): 147–160. https://doi.org/10.3372/wi.27.2713

Malaisse F, Bamps P (1993) *Amorphophallus* (Araceae) nouveaux d'Afrique centrale. Bulletin du Jardin botanique National de Belgique / Bulletin van de Nationale Plantentuin van België 62(1/4): 175–180. https://doi.org/10.2307/3668272

Mottet S (1892) *Amorphophallus Teutzii*. Dictionnaire pratique d'horticulture et de jardinage 1: 137. https://gallica.bnf.fr/ark:/12148/bpt6k62286973/f155

Ntore S, Fischer E, Sosef MSM (2018) Red List of the endemic and range-restricted vascular plants of Burundi. Scripta Botanica Belgica 58: 1–215.

Richard A (1850) Tentamen Florae Abyssinicae 2: 1–518. Arthus Bertrand, Paris.

Schott HW (1860) Prodromus systematis Aroidearum. Vindobonae, 1–602.

Schott HW (1865) Welwitschii Iter Angolense. III. Aroideae novae. Journal of Botany, British and Foreign 3: 34–35. https://www.biodiversitylibrary.org/page/16054818

Thiers B (continuously updated) Index Herbariorum: a global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium. http://sweetgum.nybg.org/science/ih/ [accessed 30.05.2022]