

Budongo Central Forest Reserve

UGATIPA1

Country: **Uganda**

Administrative region: **Western (Region)**

Central co-ordinates: **1.81328 N, 31.61038 E**

Area: **822km²**

Qualifying IPA criteria

A(i), A(iii), C(iii)

IPA assessment rationale

Budongo Central Forest Reserve qualifies as an Important Plant Area under criterion A and C. Sub-criterion A(i) is triggered by the presence of one Critically Endangered, four Endangered and 15 Vulnerable species, while A(iii) is triggered by the presence of highly restricted endemics, *Afrothimia winkleri* var. *budongensis* (DD). *Uvariopsis* sp. nov. 1 'Uganda' could also trigger this latter sub-criterion once fully described. Finally, Budongo CFR triggers sub-criterion C(iii), as the best site nationally for Lake Victoria drier peripheral semi-evergreen Guineo-Congolian rainforest (CR) and an important site for the conservation of Moist Combretum wooded grassland (EN).

Site description

Budongo Central Forest Reserve IPA covers an area of 822 km² and falls across Masindi and Hoima districts, in the Bunyoro region of west Uganda. Situated around 10 km east of Lake Albert and 10 km west of Masindi Town, the reserve lies on a gently rolling peneplain with altitudes ranging from 690 m at the edge of the Lake Albert escarpment to 1245 m on Igisi Hill in the northeast of the IPA. Much of the site is dominated by semi-deciduous, moist lowland forest.

However, towards the northeast this forest occurs in a mosaic with woodland and savanna, while along the northwest of the site, which largely follows the edge of the Lake Albert Escarpment, the vegetation is dominated by Combretum savanna.

This IPA was first designated as a Central Forest Reserve in 1932 and forms a continuous conservation corridor with neighbouring Murchison Falls National Park to the northeast. Formerly managed for forestry, Budongo consists of three forest blocks: the main Budongo block covers the central and largest block of forest, while the south westerly projection of the forest reserve is Siba Forest which is separated from the main Budongo block by the Masindi-Biso Road. The third forest block of Kaniyo-Pabidi sits adjacent to Murchison Falls National Park and was formerly outside Budongo Central Forest Reserve (Nangendo 2005).

Botanical significance

Budongo Central Forest Reserve is one of the most extensive and important mid-elevation forest blocks in both Uganda and East Africa, located at the eastern edge of the Guineo-Congolian centre of endemism (White 1983). Extensive botanical studies have been made of this site over several decades including by Eggeling (1947) and Synnott (1985) with the latter checklist consisting of 866 plant species known from the site.

Alongside a geographically unique position, Budongo is also of great conservation value as it hosts several rare and threatened species. Three species, for instance, have global distributions restricted entirely to Budongo CFR. The epiphytic orchid *Distylodon comptum* is endemic to the forests of Budongo and is only known from its type collection (Eggeling #5381). This species has been assessed as Critically Endangered, Possibly Extinct, having not been collected since 1943 (Amano et al., in press.). Similarly, *Afrothimia winkleri* var. *budongensis* (DD) is also endemic to Budongo and, at the species level, *A. winkleri* has been assessed as Critically Endangered. Even within the IPA itself, this variety is known to be rare. As a saprophytic herb, this species resides in the leaf litter and was first collected in 1940 from an area of closed forest at Budongo (Synnott 1985), with a more recent specimen from 1998 noting that this species occurred in unlogged forest (African Tropical Biodiversity Programme #653). Little is known of its ecology and, therefore, further research into the environmental conditions on which *A. winkleri* var. *budongensis* relies upon could help support the conservation of this rare variety.

A third species known only from Budongo, *Uvariopsis* sp. nov. 1 'Uganda', was collected at Budongo within the Nyakafunjo Nature Reserve at the site. This undescribed species was recognised as a novelty through phylogenetic analysis carried out by Dagallier (2021). The collection of more material, particularly the fruits and flowers of this species, which are currently unknown, is required to describe this species as new to science.

Alongside these site endemics, there are also four Endangered species known from within the IPA. The first of these, *Tiliacora latifolia*, is a liana endemic to Uganda that grows within the mixed forests of Budongo. *T. latifolia* is only known from one other locality globally, Kalinzu Central Forest Reserve around 150 km southwest of this IPA. A small number of collections have been made of this species at Budongo, although none in recent decades. Synnott (1985) stated that this liana was common in the "treated mixed forest blocks", referring to the forestry management practice at the time of planting desirable timber trees and clearing unwanted community species with herbicide. Further research is needed to confirm this species is still extant at Budongo.

In addition, the Endangered shrub *Oxyanthus ugandensis* occurs in the understorey of Siba Forest block, in the south-west of the IPA.

While this species is also known from Tanzania and possibly the D. R. Congo, in Uganda it is only known from this IPA and Semiliki National Park. Budongo IPA therefore represents a critical opportunity to conserve this species, especially as its Tanzanian locality at Bukoba is known to be threatened by ongoing habitat clearance (Ntore et al. 2019).

Commelina zenkeri (EN) has a highly disjunct known distribution, with a small number of specimens in western Uganda and Eastern and Central Cameroon. However, it is suspected that one of these Cameroonian localities is possibly extinct (Lovell & Cheek 2020). *Balsamocitrus dawei*, is the final Endangered species known from Budongo. Although this Ugandan endemic is known from a number of forest reserves across the country, many of these are poorly managed and *B. dawei* is likely threatened by habitat loss elsewhere (Amani et al. 2022; Kalema and Beentje 2012). Similarly, the Vulnerable Ugandan endemic *Dasylepis eggelingii* is known from a number of protected areas, including Budongo, but is threatened by illegal tree felling and charcoal production throughout its range, with *D. eggelingii* itself possibly used for charcoal production (Kalema et al. 2021).

Overall, there are 18 globally Vulnerable species known from Budongo forest, including three orchid species and six timber trees. Of the Vulnerable orchid species at this site, *Triceratorhynchus viridiflorus* is of particular note as Budongo is the only known location for this species nationally (Gereau et al. 2019).

Contrastingly, all six of the Vulnerable timber trees (*Entandrophragma cylindricum*, *E. utile*, *Khaya anthotheca*, *K. grandifoliola*, *K. senegalensis* and *Prunus africana*) known from this site are widespread across tropical Africa. However, for all but *Prunus africana*, a species that is largely found at higher altitudes, and *Khaya senegalensis*, which is more common in woodlands and riverine habitats, Budongo represents one of the five best sites for conserving these species nationally.

For all other Vulnerable species present at this site, Budongo represents one of the five best sites nationally and is an important opportunity for conserving these species that are threatened with extinction.

While Budongo is an important site for rare and threatened species, it also of great importance as a site at the very eastern edge of range for a number of Guineo-Congolian forest species. For example, Budongo represents the only known occurrences within the Flora of Tropical East Africa region for four orchid species, *Angraecopsis macrophylla*, *Habenaria buettneriana*, *Nervilia subintegra* and *Rhipidoglossum cuneatum* (*Diaphananthe cuneata*), (Summerhayes 1968; Cribb 1989; Budongo Conservation Field Station 2022). Budongo also represents the only known locality for the Ochnaceae species *Idertia axillaris* in this region (Sosef 2013). While all five of these species are also known throughout the Central Africa floral region, their presence at this site represents Budongo's unique position at the very edge of the Guineo-Congolian centre of endemism (White 1983). The forest itself is categorised as Lake Victoria drier peripheral semi-evergreen Guineo-Congolian rainforest, which is assessed as nationally Critically Endangered (Richards et al., In Review). Budongo is the most extensive site for this habitat nationally and critical in the conservation of this habitat that was once

more widespread in western Uganda (van Breugel et al. 2015). Alongside forest that is of conservation significance, the moist Combretum woodland, which occurs in the north and east of this IPA, has been assessed as a nationally Endangered habitat. Elsewhere, this habitat is threatened by conversion to agriculture with extensive habitat loss in central Uganda either side of Lake Kyogo (Richards et al., In review).

Habitat and geology

The soils of this site are primarily ferralitic sandy or sandy clay loams (Howard 1991). Budongo is underlain by pre-Cambrian granulite rock (Nangendo 2005).

The area experiences two peaks in the wet season, from April to May and September to October, while a strong dry season occurs from December to February (Synott 1985). Rainfall is on average between 1,397 and 1,524 mm annually with the southern and eastern parts of Budongo experiencing the highest rainfall (Nangendo 2005).

Much of the site is dominated by semi-deciduous, moist lowland forest. The climax community is described by Langdale-Brown et al. (1964) as *Cynometra-Celtis*, dominated by *Cynometra alexandri* and *Celtis philippensis*. This forest type is generally associated with poorer soils and, as a climax community, occurs only following long periods without disturbance.

Swamp forest occurs in wetter valleys with poor drainage and is dominated by *Calamus deerratus*. These areas are flooded during the wet seasons and remain waterlogged year-round (Reynolds et al. 2012). Most of these swamp forests are located within valleys along streams such as the Sonso and Weisoke, which flow through the main Budongo forest block northwards towards Lake Albert (Eggeling 1947). Siba forest block, although primarily *Cynometra-Celtis* forest, has some areas of gallery forest along the Siba and Waki River tributaries (Eggeling 1947).

In areas of better drainage, there are three types of sub-climax forest communities as recognised by Eggeling (1947). Two forms of colonising forest, "woodland forest" and *Maesopsis* forest, are both early stages in the successional gradient. *Maesopsis* forest occurs on areas with more fertile soils and is differentiated from the woodland forest by the presence of *Maesopsis eminii* and *Acanthus polystachyus*, the latter species forming a fire-resistant forest boundary (Nangendo 2005). The woodland forest is instead dominated by species such as *Albizia zygia*, *Caloncoba crepiniana*, *Croton sylvaticus*, *Dombeya* spp. and *Olea welwitschii* (Eggeling 1947; Synott 1985). Further along the successional gradient, a mixed forest type develops, featuring large trees of various species. This vegetation type is rich in valuable mahogany species such as *Entandrophragma* spp. and *Khaya anthotheca*. Other common trees include *Celtis zenkeri*, *Gambeya* spp. and *Cynometra alexandri* with shrubs of *Rinorea brachypetala* common in the understorey (Eggeling 1947; Nangendo 2005).

Areas of woodland occur primarily in the northern and eastern parts of the IPA, often in a mosaic with forest and savanna elements of the landscape. Compared to the forests of Budongo, the woodlands

are poorer in tree species, hosting around one sixth of the species total (Nangendo 2005). Nangendo (2005) noted that in Budongo closed woodland can be typified by the presence of *Terminalia schimperiana* and *Albizia grandibracteata*, while the most open woodland is dominated by *C. molle* and *Grewia mollis*.

Wooded grassland is located in areas most frequently disturbed by fire; it features trees of *Combretum collinum* subsp. *binderanum*, *C. gueinzii*, *Grewia bicolor* and *Philenoptera (Lonchocarpus) laxiflora* (Nangendo 2005). Immediately following burning, the grassy vegetation in these areas is dominated by *Setaria sphacelata*, while *Urochloa brizantha* is also frequent, but in time these shorter grasses are replaced by taller *Hyparrhenia cymbaria* (Eggeling 1947).

Conservation issues

Budongo IPA follows the boundary of Budongo Central Forest Reserve (CFR), managed by the National Forest Authority. Towards Kaniyo-Pabidi, spanning the forest and woodland in the north-east of the site, Budongo overlaps with two Wildlife Reserves: Bugungu, covering the woodland-forest mosaic in the west of this area, and Karuma, covering the eastern side including Kaniyo-Pabidi forest. These two Wildlife Reserves are run by the Uganda Wildlife Authority alongside neighbouring Murchinson Falls National Park and together these areas are referred to as the Murchinson Falls Protected Area (Rwetsiba & Nuwamanya 2010).

The site was previously subjected to a silvicultural regime from the 1920s onwards. Forestry operations included selective logging of timber species such as *Entandrophragma cylindricum*, *Khaya anthotheca* and *Milicia excelsa* and planting of these species to supplement supply, alongside the use of arboricide to remove species such as *Cynometra alexandri* that competed with the valuable timber species. It is estimated that over three-quarters of Budongo has been significantly impacted by forestry operations (Howard 1991). However, forestry at the site declined as timber became less profitable and, since the early 1990s, much of the activity at this site has been conservation focussed. Budongo Conservation Field Station (previously Budongo Forest Project) was established in 1990 to facilitate conservation and research, integrating forest-edge community livelihoods within this work. Much of the conservation effort at this site has been focused on the primate communities, particularly chimpanzees, although a herbarium storing specimens from the site has been established on-site for visiting botanists. Tree planting initiatives surrounding Budongo, pine plantations in particular, have previously been promoted under the 2003 Tree Planting Act to encourage the use of alternative sources of timber. This act also supported clearer demarcation of the site, and a survey of local people suggests there is a good understanding of the site boundaries (Twongyirwe et al. 2018).

However, poverty amongst local communities exacerbates threats to Budongo. Pitsaws are used to cut trees for firewood, charcoal and timber. While large-scale forestry operations have ceased at the site, there is still some illegal, selective logging of mahoganies such as

Khaya and *Entandrophragma* species. As recently as 2014, local forestry officials have observed that mahogany species are scarce in Budongo suggesting that, while the forest itself remains intact, there is a particular toll of harvesting on valuable species (Twongyirwe et al. 2018).

Succession at this site tends towards *Cynometra alexandri* (Ironwood) dominated forests, while disturbance is known to promote the establishment of invasive species *Broussonetia papyrifera*, or paper mulberry tree, which occurs in forest edges and gaps of Budongo (Kalema et al. 2021). However, there is a long history of local hunters systematically burning parts of the savanna-woodland mosaic in Budongo (Paterson 1991). Past management plans have stated that burns should be part of the management of the site, however, the National Forestry Authority have instead relied on local communities to undertake burns on their behalf. While these burns still occur to the northwestern edge of the CFR, local communities fear prosecution if caught burning in the UWA managed wildlife reserves around Kaniyo-Pabidi and so are reluctant to burn this area (Nangendo 2005). As a result, there has been significant forest expansion in the north-east of Budongo CFR with the main Budongo forest block becoming contiguous with Kaniyo-Pabidi forest in places. Only a few decades previously, the two blocks were separated by a woodland-savanna mosaic (Google Earth 2022). Field staff within Budongo observe that, without fire, closed woodland becomes too moist to burn and then develops unchecked into forest (Nangendo 2005). The succession of savanna-woodland mosaic to forest could be of concern as the moist *Combretum* savanna within this mosaic is a nationally Endangered habitat type.

There have, however, been a number of conservation successes at Budongo. From satellite imagery, it is evident that Budongo CFR is well protected from habitat clearance, with the forests in the south of the IPA contrasting starkly with the agricultural land outside the reserve (Google Earth 2022). Extensive areas of land surrounding Budongo has been given over to commercial sugarcane and tobacco farming (Atuhe 2010; Twongyirwe et al. 2018). Satellite data between 1985 and 2014 demonstrates that tree cover has remained significantly higher within Budongo CFR compared to the surrounding areas which have experienced a net loss in tree cover (Twongyirwe et al. 2015).

Budongo CFR has been proposed as a Key Biodiversity Area due to the presence of two Endangered faunal species, Chimpanzee (*Pan troglodytes*) and Nahan's Partridge (*Ptilopachus nahani*), as well as three plant trigger species including *Balsamocitrus dawei* (EN) and two other species which would no longer qualify due to expansions in known range. The site had already been recognised as an Important Bird Area, due to the presence of several rare and threatened bird taxa, including the entire Ugandan population of Yellow-footed Flycatcher (*Muscicapra sethsmithi*, LC) (Birdlife International 2022).

Site assessor(s)

Sophie Richards, Royal Botanic Gardens, Kew

IPA criterion A species

SPECIES	QUALIFYING SUB-CRITERION	≥ 1% OF GLOBAL POPULATION	≥ 5% OF NATIONAL POPULATION	1 OF 5 BEST SITES NATIONALLY	ENTIRE GLOBAL POPULATION	SOCIO-ECONOMICALLY IMPORTANT	ABUNDANCE AT SITE
<i>Tiliacora latifolia</i> Troupin	A(i)	✓	✓	✓	–	–	Common
<i>Distylodon comptum</i> Summerh.	A(i)	✓	✓	✓	✓	–	Unknown
<i>Oxyanthus ugandensis</i> Bridson	A(i)	✓	✓	✓	–	–	Unknown
<i>Afrothimia winkleri</i> (Engl.) Schltr. var. <i>budongoensis</i> Cowley	A(iii)	✓	✓	✓	✓	–	Scarce
<i>Dasylepis eggelingii</i> J.B.Gillett	A(i)	✓	✓	✓	–	–	Unknown
<i>Prunus africana</i> (Hook.f.) Kalkman	A(i)	–	–	–	–	✓	Occasional
<i>Balsamocitrus dawei</i> Stapf	A(i)	✓	✓	✓	–	–	Unknown
<i>Khaya anthotheca</i> (Welw.) C.DC.	A(i)	–	–	✓	–	✓	Frequent
<i>Khaya grandifoliola</i> C.DC.	A(i)	–	–	✓	–	✓	Frequent
<i>Khaya senegalensis</i> (Desv.) A.Juss.	A(i)	–	–	–	–	✓	Frequent
<i>Gambeya muerense</i> (Engl.) Liben	A(i)	✓	–	✓	–	–	Frequent
<i>Entandrophragma cylindricum</i> (Sprague) Sprague	A(i)	–	–	✓	–	✓	Frequent
<i>Entandrophragma utile</i> (Dawe & Sprague) Sprague	A(i)	–	–	✓	–	–	Unknown
<i>Psilotrichum majus</i> Peter	A(i)	✓	✓	✓	–	–	Unknown
<i>Aeglopsis eggelingii</i> M.Taylor	A(i)	✓	✓	✓	–	–	Unknown
<i>Mimusops bagshawei</i> S.Moore	A(i)	✓	–	✓	–	–	Unknown

SPECIES	QUALIFYING SUB-CRITERION	≥ 1% OF GLOBAL POPULATION	≥ 5% OF NATIONAL POPULATION	1 OF 5 BEST SITES NATIONALLY	ENTIRE GLOBAL POPULATION	SOCIO-ECONOMICALLY IMPORTANT	ABUNDANCE AT SITE
<i>Thunbergia bogoroensis</i> De Wild.	A(i)	–	✓	✓	–	–	Unknown
<i>Disperis aphylla</i> Kraenzl. ex De Wild. & T.Durand	A(i)	–	–	✓	–	–	Unknown
<i>Polystachya stauroglossa</i> Kraenzl.	A(i)	✓	✓	✓	–	–	Unknown
<i>Triceratorhynchus viridiflorus</i> Summerh.	A(i)	✓	✓	✓	–	–	Unknown
<i>Achyrosperrum axillare</i> E.A.Bruce	A(i)	✓	–	✓	–	–	Unknown
<i>Dicranolepis pyramidalis</i> Gilg	A(i)	–	✓	✓	–	–	Unknown
<i>Oxyanthus troupinii</i> Bridson	A(i)	✓	✓	✓	–	–	Unknown
<i>Commelina zenkeri</i> C.B.Clarke	A(i)	✓	✓	✓	–	–	Unknown

IPA criterion C qualifying habitats

HABITAT	QUALIFYING SUB-CRITERION	≥ 5% OF NATIONAL RESOURCE	≥ 10% OF NATIONAL RESOURCE	1 OF 5 BEST SITES NATIONALLY	AREAL COVERAGE AT SITE
Lake Victoria drier peripheral semi-evergreen Guineo-Congolian rainforest (CR)	C(iii)				433
Moist Combretum wooded grassland (EN)	C(iii)		–		181

General site habitats

GENERAL SITE HABITAT	PERCENT COVERAGE	IMPORTANCE
Forest - Subtropical/Tropical Moist Lowland Forest	–	Major
Savanna - Moist Savanna	–	Minor
Forest - Subtropical/Tropical Swamp Forest	–	Minor

Land use types

LAND USE TYPE	PERCENT COVERAGE	IMPORTANCE
Nature conservation	–	Major

LAND USE TYPE	PERCENT COVERAGE	IMPORTANCE
Tourism / Recreation	–	Major

Threats

THREAT	SEVERITY	TIMING
Biological resource use - Logging & wood harvesting	Low	Ongoing - stable
Natural system modifications - Fire & fire suppression	Unknown	Ongoing - stable
Human intrusions & disturbance - Recreational activities	Low	Ongoing - stable

Protected areas

PROTECTED AREA NAME	PROTECTED AREA TYPE	RELATIONSHIP WITH IPA	AREAL OVERLAP
Bugungu Wildlife Reserve	Wildlife Reserve	protected/conservation area overlaps with IPA	133
Karuma Wildlife Reserve	Wildlife Reserve	protected/conservation area overlaps with IPA	96
Budongo Central Forest Reserve	Forest Reserve (conservation)	protected/conservation area matches IPA	822

Conservation designation

DESIGNATION NAME	PROTECTED AREA	RELATIONSHIP WITH IPA	AREAL OVERLAP
Budongo Forest Reserve	Key Biodiversity Area	protected/conservation area matches IPA	822

Management type

MANAGEMENT TYPE	DESCRIPTION	YEAR STARTED	YEAR FINISHED
Protected Area management plan in place		–	–

Bibliography

White, A.F. 1983. *The vegetation of Africa. A descriptive memoir to accompany the UNESCO/AETFAT/UNSO vegetation map of Africa.*

Amani, C., Kalema, J., Nshutiyayesu, S., & Ntore, S. 2022.

Balsamocitrus dawei. The IUCN Red List of Threatened Species 2022: e.T154236128A154387881..

Amano, M., Beentje, H. J., Gereau, R. E., Kabuye, C., Kalema, J., Kelbessa, E., Kimeu, J. M., Kindeketa, W., Luke, W. R. Q., Malombe, I., Minani, V., Mwangoka, M., Ndangalasi, H. & Ntore, S. In press. *Distylodon comptum*. The IUCN Red List of Threatened Species..

Atuhe, G. 2010. *Utilisation of Raphia farinifera by the Biiso community in Budongo sub-county.*

- Birdlife International 2022. **Important Bird Areas factsheet: Budongo Forest Reserve.**
- Budongo Conservation Field Station 2020. **Illegal Activities in BFR during COVID-19 Pandemic.**
- Budongo Conservation Field Station 2022. **Budongo Herbarium Catalogue.**
- Cribb, P. 1989. **Orchidaceae (Part 3).** Flora of Tropical East Africa.
- Dagallier, L. P. 2021. **Diversification of the tropical African flora: spatial and temporal approaches.**
- Eggeling, W. J. 1947. **Observations on the Ecology of the Budongo Rain Forest, Uganda.** Journal of Ecology, Vol 34, page(s) 20–87
- Gereau, R., Beentje, H. J., Kabuye, C., Luke, W. R. Q., Nshutiyayesu, S. & Ntore, S. 2019. **Triceratorhynchus viridiflorus.** The IUCN Red List of Threatened Species 2019: e.T111332107A111332217.
- Howard, P. C. 1991. **Nature Conservation in Uganda's Tropical Forest Reserves.**
- Kalema, J., & Beentje, H. 2012. **Conservation Checklist of the Trees of Uganda.**
- Kalema, J., Simo-Droissart, M. & Tack, W. 2021. **Dasylepis eggelingii.** The IUCN Red List of Threatened Species 2021: e.T137580592A138015016..
- Nangendo, G. 2005. **Changing forest-woodland-savanna mosaics in Uganda with implications for conservation.**
- Ntore, S., Beentje, H.J., Fischer, E., Kabuye, C., Kalema, J., Kayombo, C., Luke, W.R.Q. & Nshutiyayesu, S. 2019. **Oxyanthus ugandensis.** The IUCN Red List of Threatened Species 2019: e.T103647046A103648377..
- Paterson, J. D. 1991. **The ecology and history of Uganda's Budongo Forest.** Forest & Conservation History, Vol 35, page(s) 179-187
- Plumptre, A. J., Ayebare, S., Behangana, M., Forrest, T. G., Hatanga, P., Kabuye, C., Kirunda, B., Kityo, R., Mugabe, H., Namaganda, M., Nampindo, S., Nangendo, G., Nkuutu, D. N., Pomeroy, D., Tushabe, H. & Prinsloo, S. 2019. **Conservation of vertebrates and plants in Uganda: Identifying Key Biodiversity Areas and other sites of national importance.** Conservation Science and Practice, Vol 1, page(s) 1-12
- Reynolds, V., Lloyd, A., & English, C. 2012. **Adaptation by Budongo Forest chimpanzees (*Pan troglodytes schweinfurthii*) to loss of a primary source of dietary sodium.** African Primates, Vol 7, page(s) 156–162
- Rwetsiba, A., & Nuwamanya, E. 2010. **Aerial surveys of Murchison Falls Protected Area, Uganda, March 2010.** Pachyderm, Vol 47
- Sosef, M. S. M. 2013. **The genus *Idertia* (Ochnaceae).**
- Summerhayes, V. S. 1968. **Orchidaceae (Part 1).** Flora of Tropical East Africa.
- Synnott, T. J. 1985. **A Checklist of the Flora of Budongo Forest Reserve, Uganda, with Notes on Ecology and Phenology.** C.F.I. Occasional Papers, Vol 27
- Tenywa, G. 2021. **Bitter-sweet exchange: forest cleared for sugarcane - Part 5 - New Vision Official.** New Vision
- Twongyirwe, R., Bithell, M., & Richards, K. S. 2018. **Revisiting the drivers of deforestation in the tropics: Insights from local and key informant perceptions in western Uganda.** Journal of Rural Studies, page(s) 105-119
- Twongyirwe, R., Bithell, M., Richards, K. S., & Rees, W. G. 2015. **Three decades of forest cover change in Uganda's Northern Albertine Rift Landscape.** Land Use Policy, Vol 49, page(s) 236–251
- van Breugel, P., Kindt, R., Lillesø, J., Bingham, M., Demissew, S., Dudley, C., Friis, I., Gachathi, F., Kalema, J., Mbago, F., Moshi, H., Mulumba, J., Namaganda, M., Ndangalasi, H., Ruffo, C., Védaste, M., Jamnadass, R. & Graudal, L. 2015. **Potential Natural Vegetation Map of Eastern Africa (Burundi, Ethiopia, Kenya, Malawi, Rwanda, Tanzania, Uganda and Zambia).**
- Richards, S., Kalema, J., Ojelel, S., Williams, J. & Darbyshire, I. In review. **Improving the application of Important Plant Areas to conserve threatened habitats: a case study of Uganda.** Conservation Science and Practice
- Lovell, R. & Cheek, M. 2020. **Commelina zenkeri.** The IUCN Red List of Threatened Species 2020: e.T110080112A110080114.