TIPA ASSESSMENT

MT GANGAN SANDSTONE MOUNTAIN CHAIN, KINDIA

ABSTRACT

The Mt Gangan sandstone table mountains form a unique environment within the local area of Kindia Prefecture. The sandstone cliffs, low altitude sandstone bowal and submontane forest are all recognised as threatened vegetation types of Guinea. Species globally endemic to Mt Gangan are *Kindia gangan* (newly described in 2018), *Phyllanthus felicis* and *Clerodendrum sylvae.* Several near endemics to Mt Gangan also occur, e.g. *Pitcairnia feliciana*, the only native bromeliad in Africa. There are numerous other rare and threatened species found on the sandstone bowal, including *Plectranthus linearifolius* and *Raphionacme caerulea*.

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TIPA Assessment: Mt Gangan Sandstone Mountain Chain, Kindia

IPA criteria under which the site qualifies: A (i,iii), B (i), C (iii)

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IPA assessment rationale

The Mt Gangan sandstone table mountains form a unique environment within the local area of Kindia Prefecture, the sandstone cliffs, low altitude sandstone bowal and submontane forest are all recognised as threatened vegetation types of Guinea. Species globally endemic to Mt Gangan are *Kindia gangan* (newly described in 2018), *Clerodendrum sylviae*, *Phyllanthus felicis,* plus several near endemics to Mt Gangan e.g. *Pitcairnia feliciana*, the only bromeliad in Africa. There are numerous other rare and threatened species found on the sandstone bowal, including *Plectranthus linearifolius* and *Raphionacme caerulea*. The area also includes some disturbed lowland forest on Mt Gangan itself.

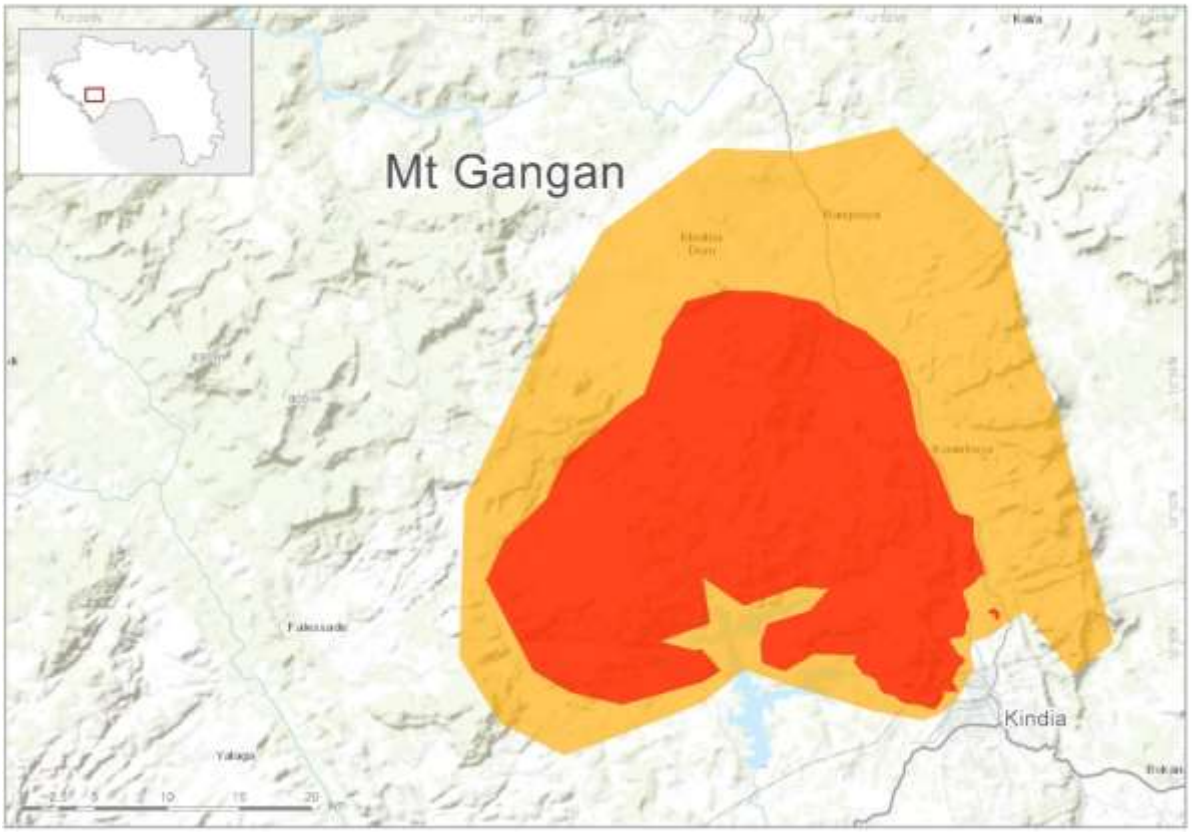
Site overview

Site Name: Mt Gangan Sandstone Mountains	
Country: Republic of Guinea	Administrative region: Kindia
Central co-ordinates: 10°09’55’’N, 12°57’03’’W	Area: 633 km^2
Altitude minimum: 663 m	Altitude maximum: 1111 m

Site description

The Mt Gangan Sandstone Mountains are located north east of the town of Kindia. The core area is 33.4 km wide and 26.5 km at its longest point. It is made up of a series of sandstone step hills intersected with valleys and surrounded by sandstone bowal. The proposed TIPA surrounds the top half of the reservoir at Samaya. Sandstone steps on the bowal have *Plectranthus* sp. nov., and *Cyanotis ganganensis* both nearly endemic to Mt Gangan. The sandstone bowal is often used for small-scale cultivation of vegetables and herbs. The crevices and cracks in the cliffs are home to numerous endemic species and new species have been recently discovered here.

Mt Gangan itself has patches of remnant submontane forest near the summit, however, much was lost due to a now disused banana plantation, and part of the summit area is cleared and littered by tourists from Kindia as a picnic spot. Part of this area was previously designated as a Classified Forest, but there has been little practical protection in recent years. The low altitude sandstone bowal, submontane forest and sandstone cliffs are recognised as threatened vegetation types in Guinea.



Map showing the proposed area for protection as a TIPA. Core area in red, buffer zone in yellow.

Botanical significance

The topographic features of the Mt Gangan Sandstone Mountains give rise to some unique habitats. Numerous species endemic to Guinea are found on the cliffs, for example *Pitcairnia feliciana* EN, the only native African member of the Bromeliaceae (pineapple family), and *Fleurydora felicis* VU (Ochnaceae) and *Clerodendrum sylvae* EN (Lamiaceae). In 2018, a new genus to science was described from these cliff areas, *Kindia gangan* (Rubiaceae), also monospecific and endemic to Mt Gangan. In addition, *Anisotes guineensis* (Acanthaceae), *Cyanotis ganganensis* (Commelinaceae), *Apodiscus chevalieri* (Phyllanthaceae) are also present; all these species are threatened and have a very restricted distribution.

The sandstone bowal dominant grass is *Anadelphia chevalieri*, globally endemic to the Kindia area. Globally threatened species include *Utricularia pobeguinii* (Lentibulariaceae), which are also unique to the environs of Kindia, *Plectranthus linearifolius* (Lamiaceae) and an unusual variant of *Raphionacme caerulea* (Apocynaceae). *Baphia heudelotiana* VU (Leguminosae-Papillionoideae) and *Fegimanra afzelii* NT (Anacardiaceae), small trees are found in the deeper cracks of the bowal.

General habitat and geology description

Sandstone table mountains, cliffs and valleys with crevices and cracks. The valley vegetation can be quite high and dense. Sandstone bowal with seepage areas, temporary waterways. Mt Gangan itself has patches of remnant submontane forest near the summit, however, much was lost due to a previous banana plantation (now disused). In the local language of Susu, gangan means ‘Sisal’. The mountain takes its name from this plant species. Ordovician sandstone layered with younger Silurian

and Devonian argillite and siltstone; differential weathering gives rise to steps in the mountains (Source: Carte des Minéraux de la Guinee, Ministry of Mines, Government of Guinea, 2006).

Conservation issues

There are several threats to this area. Fires from the cattle herders are an issue in the lowland bowal area and potentially they can move up valleys and onto the cliffs. Cattle herds of large numbers have been observed in this area and this can cause damage through trampling and overgrazing. Cultivation of market garden produce is a threat to the bowal. This is currently quite localised and small scale, but threatens some areas where *Raphionacme caerulea* has been observed. There is also a threat from lowland forest being cleared for charcoal production. *Fleurydora felicis* is used by the local people as a medicine, but the level of collection and utilisation is not known.

Protected area status and management

Mt Gangan Classified Forest was designated in 1942 and will be encompassed by the proposed TIPA. Not all Classified Forests are given protected area status in Guinea. There is no known management plan for this area.

Threats

Settlement:	Settlement expansion inside the area
Market gardening:	Production of vegetables for Kindia
Charcoal production:	Excessive wood cutting
Subsistence agriculture:	Slash and burn techniques
Cattle grazing:	Nomadic herders and by local people
Fire:	Fire used to clear for grazing, hunting and agriculture

Threat level: High

Criterion A: Threatened Species

			Site contains…					
Criterion A taxon present	IPA sub-criterion	IUCN redlist assessment	**≥ 1% of global population**	**≥ 5% of national population**	**Is 1 of 5 best sites nationally**	Entire global population (single-site endemic)	Species is of socio-economic importance	*Abundance at site
Pitcairnia feliciana (A.Chev.) Harms & Mildbr.	A(i,iii)	EN	⊙	⊙	⊙	○		Frequent
Fleurydora felicis A.Chev.	A(i,iii)	VU	⊙	⊙	⊙		⊙	Infrequent
Kindia gangan Cheek	A(i,iii)	EN	⊙	⊙	⊙	⊙		Infrequent
Anisotes guineensis Lindau	A(i,iii)	EN	⊙	⊙	⊙			Infrequent
Apodiscus chevalieri Hutch.	A(iii)	EN	⊙	⊙	⊙			Infrequent
Baphia heudelotiana Baill.	A(i)	VU	⊙	⊙	⊙			Infrequent
Cyanotis ganganensis Schnell	A(iii)	EN	⊙	⊙	⊙			Infrequent
Anadelphia pumila Jacq.-Fél.	A(i)	CR	⊙	⊙	⊙	⊙		Unknown
Dilophotriche occidentalis Jacq.-Fél.	A(i)	VU	⊙	⊙	⊙			Infrequent
Digitaria patagiata Henrard	A(i)	EN?	⊙	⊙	⊙			Unknown
Dissotis humilis A.Chev. & Jacq.-Fel.	A(iii)	VU?	⊙	⊙	⊙			Infrequent
Heterotis pygmea (A.Chev. & Jacq.-Fél.) Jacq.-Fél.	A(iii)	EN	⊙	⊙	⊙			Infrequent
Dissotis leonensis Hutch. & Dalz	A(i,iii)	EN	⊙	⊙	⊙			Infrequent
Keetia susu Cheek i	A(iii)	EN	⊙	⊙	⊙			Infrequent
Bulbostylis guineensis (A. Rich.) C.B. Clarke	A(i)	EN	⊙	⊙	⊙			Infrequent
Utricularia pobeguinii Pellegr.	A(i)	EN	⊙	⊙	⊙			Infrequent
Utricularia macrocheilos (P.Taylor) P.Taylor	A(i,iii)	VU	⊙	⊙				Infrequent
Utricularia tetraloba P.Taylor	A(i,iii)	VU	⊙	⊙	⊙			Infrequent
Clerodendron sylviae J.-G.Adam	A(iii)	EN	⊙	⊙	⊙	⊙		Scarce
Anadelphia chevalieri Reznik	A(i)	EN?	⊙	⊙	⊙			Frequent

Phyllanthus felicis J.F.Brunel	A(i)	CR(PE)	⊙	⊙	⊙	⊙		Scarce
Schizachyrium penicillatum Jacq.-Fél	A(i)	EN	⊙	⊙	⊙			Unknown
Schizachyrium radicosum Jacq.-Fél.	A(i,iii)	EN	⊙	⊙	⊙			Unknown
Anadelphia macrochaeta (Stapf) Clayton	A(i,iii)	VU	⊙	⊙				Infrequent
Anadelphia trichaeta (Reznik) Clayton	A(i)	VU	⊙	⊙				Infrequent
Napoleonaea alata Jongkind	A(i)	EN	⊙	⊙	⊙			Infrequent

Key: IUCN category: CR Critically Endangered, EN Endangered, VU Vulnerable. Abundance: Abundant, Common, Frequent, Infrequent, Scarce, Unknown

Criterion B: Botanical Richness

B(i) exceptional botanical richness within a defined habitat			B(ii): exceptional number of species of conservation importance - site recording table (from nationally agreed list)		B(iii): exceptional number of useful / culturally valuable species (from nationally agreed list)	
*Habitat code and name	**Site is part of the top 10% of the national resource**	**Site is one of the 5 best sites nationally for that habitat**	**Site contains ≥ 3% of the species on the national list**	**Site is one of the 15 richest locations nationally**	**Site contains ≥ 3% of the species on the national list**	**Site is one of the 15 richest locations nationally**
Sandstone cliffs	⊙	⊙	○	○	○	○
Low altitude sandstone bowal	⊙	⊙				

*Criterion B taxon present	Sub-criterion under which species qualifies	For B(i) – indicator of habitat	*Abundance at site
Pitcairnia feliciana (A.Chev.) Harms & Mildbr.	B(i)	Sandstone cliffs	Frequent
Fleurydora felicis A.Chev.	B(i)	Sandstone cliffs	Infrequent
Kindia gangan Cheek	B(i)	Sandstone cliffs	Infrequent
Anisotes guineensis Lindau	B(i)	Sandstone cliffs	Infrequent
Apodiscus chevalieri Hutch.	B(i)	Sandstone cliffs	Infrequent
Cyanotis ganganensis Schnell	B(i)	Sandstone cliffs and Sandstone Bowal (low altitude)	Infrequent
Keetia susu Cheek ined.	B(i)	Sandstone cliffs and Sandstone Bowal (low altitude)	Infrequent
Dissotis humilis A.Chev. & Jacq.-Fel.	B(i)	Sandstone cliffs and Sandstone Bowal (low altitude)	Infrequent
Heterotis pygmea (A.Chev. & Jacq.-Fél.) Jacq.-Fél.	B(i)	Sandstone cliffs and Sandstone Bowal (low altitude)	Infrequent

Fegimanra afzelii Engl.	B(i)	Sandstone cliffs and Sandstone Bowal (low altitude)	Infrequent
Raphionacme caerulea E.A.Bruce	B(i)	Sandstone Bowal (low altitude)	Infrequent
Plectranthus linearifolius (J.K.Morton) B.J.Pollard & A.J.Paton	B(i)	Sandstone Bowal (low altitude)	Scarce
Utricularia pobeguinii Pellegr.	B(i)	Sandstone Bowal (low altitude)	Scarce

Key: Abundance: Abundant, Common, Frequent, Infrequent, Scarce, Unknown

Criterion C: Threatened Habitat

			Site contains…		
*Habitat type	IPA subcriterion	IUCN redlist assessment	**≥ 5% of national resource (for C(i) and C(ii))**	**≥ 10% of national resource (for C(iii))**	Estimated area at site (if known)
Sandstone bowal	C (iii)		○	⊙	451km^2
Sandstone cliffs	C (iii)			⊙	58.2km^2

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D Molmou and T Seny Dore, Oct 2017 : Rapport Darwin de la mission a Kebe Friguia et environs, Kindia.

C Couch, Oct 2017: Darwin TIPAs Report Field expedition to Friguiagbé and Kindia area 26-29 October 2017

Site in pictures

Low altitude sandstone bowal with *Anadelphia chevalieri*, October 2017 (Photo: ©C. Couch, RBG Kew)

Sandstone Step Mountains, Mt Gangan, Kindia, June 2016 (Photo: ©C. Couch, RBG Kew)

Kindia gangan (Photo: ©M. Cheek, RBG Kew)

Utricularia pobeguinii (Photo: ©C. Couch, RBG Kew)

Fleurydora felicis (Photo: ©M. Cheek, RBG Kew)

Pitcairnia feliciana (Photo: ©M. Cheek, RBG Kew)

Market gardening on edge of sandstone bowal, Mt Gangan, Kindia (Photo: ©C. Couch, RBG Kew)