

## 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), *Clerodendrum sylviae*, plus several near endemics to Mt Gangan e.g. *Pitcairnia felicianae*, the only 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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# TIPAs Report: Mt Gangan Sandstone Mountain Chain, Kindia

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

## 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*, 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° 9' 55''N, 12° 57' 3''W | Area (km <sup>2</sup> ): 633 Km |
| Altitude minimum: 663m                           | Altitude maximum: 1111m         |

## SITE DESCRIPTION

The Mt Gangan Sandstone Mountains are located north east of the town of Kindia. The core area is 33.4km wide and 26.5km at its longest point. It is made up of a series of sandstone step hills intersected with valleys and surrounded by sandstone bowal habitat. The proposed IPA surrounds the top half of the reservoir at Samaya. Sandstone steps on the bowé have *Plectranthus sp nov*, and *Cyanotis ganganensis* both 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 sub-montane forest near summit, however, much was lost due to a previous banana plantation now disused, 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.

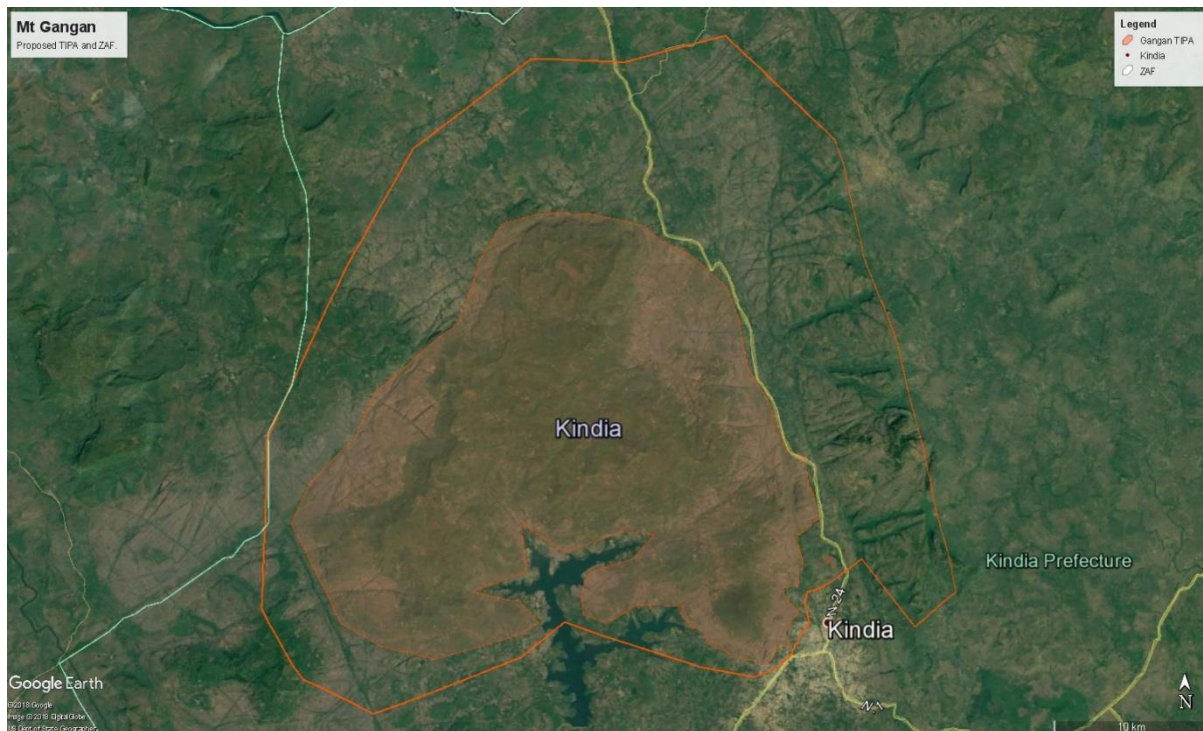


Image from Google Earth showing the proposed IPA site based on the existing protected area

#### BOTANICAL SIGNIFICANCE

The topographic features of the Mt Gangan Sandstone Mountains give rise to some unique habitats. Numerous genera endemic to Guinea are found on the cliffs, for example *Pitcairnia feliciana* (EN), the only member of the Bromeliaceae (Pineapple family), and *Fleurydora felicis* (VU) (Ochnaceae) and *Clerodendrum sylviae*. In 2018, a new genus to science was described from these cliff areas, *Kindia gangan* (Rubiaceae), also monospecific and endemic to Kindia. In addition, *Anisotes guineensis*, *Cyanotis ganganensis*, *Apodiscus chevalieri* are also present; all these species are threatened and have a very restricted distribution. The sandstone bowé dominant grass is *Anadelphia chevalieri*, globally endemic to the Kindia area and has globally threatened species including *Utricularia pobeguini*, *Mesanthemum auratum* (both unique to the environs of Kindia), *Plectranthus linearifolius* and an unusual variant of *Raphionacme caerulea*. *Baphia heudelotiana* (VU) and *Fegimanra afzelii* (NT), 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 sub-montane forest near 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 Guinée, 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 population as a medicament, 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      |                                                         |
| Subsistence agriculture: | Slash and burn techniques                               |
| Cattle grazing:          | Nomadic herders and by local population                 |
| Fire:                    | Fire used to clear for grazing, hunting and agriculture |

THREAT LEVEL: High

## Criterion A: Threatened Species

| Criterion A taxon present                                              | IPA sub-criterion | IUCN redlist assessment | Site contains...          |                             |                                 | For KBA compatibility: Site contains... |                                                | Species is of socio-economic importance | *Abundance at site |
|------------------------------------------------------------------------|-------------------|-------------------------|---------------------------|-----------------------------|---------------------------------|-----------------------------------------|------------------------------------------------|-----------------------------------------|--------------------|
|                                                                        |                   |                         | ≥ 1% of global population | ≥ 5% of national population | Is 1 of 5 best sites nationally | ≥ 10% of global population              | Entire global population (single-site endemic) |                                         |                    |
| [Genus, species, Author, [infra rank, infra name, infra Author]]       |                   | [category and criteria] | ○                         | ○                           | ○                               | ○                                       | ○                                              | N                                       |                    |
| <i>Pitcairnia feliciana</i> (A.Chev.) Harms & Mildbr.                  | A(i)              | EN                      | ⊙                         | ⊙                           | ⊙                               | ⊙                                       | ○                                              | N                                       | Frequent           |
| <i>Fleurydora felix</i> A.Chev.                                        | A(i)              | VU                      |                           | ⊙                           | ⊙                               | ⊙                                       |                                                | Y                                       | Infrequent         |
| <i>Kindia gangan</i> Cheek                                             | A(i)              | EN                      | ⊙                         | ⊙                           | ⊙                               | ⊙                                       | ⊙                                              | N                                       | Infrequent         |
| <i>Anisotes guineensis</i> Lindau                                      | A(i)              | EN                      |                           | ⊙                           | ⊙                               | ⊙                                       |                                                | N                                       | Infrequent         |
| <i>Apodiscus chevalieri</i> Hutch.                                     | A(iii)            | VU?                     |                           | ⊙                           | ⊙                               |                                         |                                                | ?                                       | Infrequent         |
| <i>Fegimanra afzelii</i> Engl.                                         | A(ii)             | NT                      | ⊙                         |                             |                                 |                                         |                                                | Y                                       | Infrequent         |
| <i>Baphia heudelotiana</i> Baill.                                      | A(i)              | VU                      | ⊙                         |                             | ⊙                               |                                         |                                                | ?                                       | Infrequent         |
| <i>Raphionacme caerulea</i> E.A.Bruce                                  | A(i)              | EN                      |                           |                             |                                 |                                         |                                                |                                         | Scarce             |
| <i>Plectranthus linearifolius</i> (J.K.Morton) B.J.Pollard & A.J.Paton | A(i)              | EN                      |                           |                             |                                 |                                         |                                                |                                         | Scarce             |
| <i>Bafodeya benna</i> (Scott-Elliot) Prance                            | A(i)              | VU                      |                           |                             |                                 |                                         |                                                |                                         | Scarce             |
| <i>Cyanotis ganganensis</i> Schnell                                    | A(iii)            | EN?                     |                           | ⊙                           | ⊙                               |                                         |                                                |                                         | Infrequent         |
| <i>Anadelphia pumila</i> Jacq.-Fél.                                    | A(i)              | VU?                     | ⊙                         |                             | ⊙                               |                                         |                                                |                                         | ?                  |
| <i>Dilophotriche occidentalis</i> Jacq.-Fél.                           | A(i)              | VU?                     | ⊙                         |                             | ⊙                               |                                         |                                                |                                         |                    |
| <i>Digitaria patagiata</i> Henrard                                     | A(i)              | EN?                     | ⊙                         |                             | ⊙                               |                                         |                                                |                                         |                    |
| <i>Dissotis humilis</i> A.Chev. & Jacq.-Fél.                           | A(iii)            | VU?                     |                           | ⊙                           | ⊙                               |                                         |                                                |                                         |                    |
| <i>Heterotis pygmaea</i> (A.Chev. & Jacq.-Fél.) Jacq.-Fél.             | A(iii)            | VU?                     |                           | ⊙                           | ⊙                               |                                         |                                                |                                         |                    |

|                                                      |        |     |   |   |   |   |  |   |            |
|------------------------------------------------------|--------|-----|---|---|---|---|--|---|------------|
| <i>Keetia susu</i> Cheek ined.                       | A(iii) | VU? |   | ⊙ | ⊙ |   |  | ? | Infrequent |
| <i>Bulbostylis guineensis</i> (A. Rich.) C.B. Clarke | A(i)   | EN  | ⊙ | ⊙ | ⊙ |   |  |   | Infrequent |
| <i>Utricularia pobeguini</i> Pellegr.                | A(i)   | EN  |   | ⊙ | ⊙ |   |  |   | Infrequent |
| <i>Clerodendron sylvae</i> J.-G.Adam                 | A(iii) | CR? | ⊙ | ⊙ | ⊙ |   |  |   | Scarce     |
| <i>Anadelphia chevalieri</i> Reznik                  | A(i)   | EN? | ⊙ | ⊙ | ⊙ | ⊙ |  | ? | Frequent   |

## 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 |
| [can add multiple habitats for B(ii)]                        | ⊙                                                    | ⊙                                                           | ○                                                                                                                    | ○                                                  | ○                                                                                                | ○                                                  |
| Sandstone cliffs                                             |                                                      |                                                             |                                                                                                                      |                                                    |                                                                                                  |                                                    |
| Low altitude sandstone bowl                                  | ⊙                                                    | ⊙                                                           |                                                                                                                      |                                                    |                                                                                                  |                                                    |

| *Criterion B taxon present [select from taxon look-up table]     | Sub-criterion under which species qualifies [populated automatically from taxon look up table] | For B(i) – indicator of habitat [habitat name and code populated automatically brought across from look-up table (b)] | *Abundance at site |
|------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|--------------------|
| [Genus, species, Author, [infra rank, infra name, infra Author]] | B(x) [could be more than one]                                                                  |                                                                                                                       |                    |
| <i>Pitcairnia feliciana</i> (A.Chev.) Harms & Mildbr.            | B(i)                                                                                           | Sandstone cliffs                                                                                                      | Frequent           |
| <i>Fleurydora felicis</i> A.Chev.                                | B(i)                                                                                           | Sandstone cliffs                                                                                                      | Infrequent         |
| <i>Kindia gangan</i> Cheek                                       | B(i)                                                                                           | Sandstone cliffs                                                                                                      | Infrequent         |
| <i>Anisotes guineensis</i> Lindau                                | B(i)                                                                                           | Sandstone cliffs                                                                                                      | Infrequent         |
| <i>Apodiscus chevalieri</i> Hutch.                               | B(i)                                                                                           | Sandstone cliffs                                                                                                      | Infrequent         |
| <i>Cyanotis ganganensis</i> Schnell                              | B(i)                                                                                           | Sandstone cliffs and Sandstone Bowl (low altitude)                                                                    | Infrequent         |
| <i>Keetia susu</i> Cheek ined.                                   | B(i)                                                                                           | Sandstone cliffs and Sandstone Bowl (low altitude)                                                                    | Infrequent         |
| <i>Dissotis humilis</i> A.Chev. & Jacq.-Fél.                     | B(i)                                                                                           | Sandstone cliffs and Sandstone Bowl (low altitude)                                                                    | Infrequent         |
| <i>Heterotis pygmea</i> (A.Chev. & Jacq.-Fél.) Jacq.-Fél.        | B(i)                                                                                           | Sandstone cliffs and Sandstone Bowl (low altitude)                                                                    | Infrequent         |

|                                |             |                                                     |            |
|--------------------------------|-------------|-----------------------------------------------------|------------|
| <i>Fegimanra afzelii</i> Engl. | B(i), (iii) | Sandstone cliffs and Sandstone Bowal (low altitude) | Infrequent |
|--------------------------------|-------------|-----------------------------------------------------|------------|

### Criterion C: Threatened Habitat

| *Habitat type    | IPA subcriterion (automatically populated from habitat look-up table) | IUCN redlist assessment (string automatically populated from look up table) | Site contains...                               |                                         | For KBA compatibility: Site contains...         |                                           |                                                        | Estimated area at site (if known) |
|------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------------|------------------------------------------------|-----------------------------------------|-------------------------------------------------|-------------------------------------------|--------------------------------------------------------|-----------------------------------|
|                  |                                                                       |                                                                             | ≥ 5% of national resource (for C(i) and C(ii)) | ≥ 10% of national resource (for C(iii)) | For CR and EN habitats: ≥ 5% of global resource | For VU habitats: ≥ 10% of global resource | For range restricted habitat: ≥ 20% of global resource |                                   |
| Sandstone bowal  | C (iii)                                                               |                                                                             | ○                                              | ⊙                                       | ○                                               | ○                                         | ○                                                      | 451km <sup>2</sup>                |
| Sandstone cliffs | C (ii)                                                                |                                                                             | ⊙                                              |                                         |                                                 |                                           |                                                        | 58.2km <sup>2</sup>               |

## Site in pictures



Low altitude sandstone bowl with *Anadelphia chevalieri*. Oct 2017 ©C. Couch, RBG Kew.



Sandstone Step Mountains, Mt Gangan, Kindia. June 2016. ©C. Couch, RBG Kew.





*Kindia gangan* Cheek ©M. Cheek, RBG Kew



*Utricularia pobeguinii* Pellegr. ©C. Couch, RBG Kew



*Fleurydora felicis* A.Chev. ©M. Cheek, RBG Kew



*Pitcairnia felicianae* (A.Chev.) Harms & Mildbr. ©M. Cheek, RBG Kew



Market gardening on edge of sandstone bowl, Mt Gangan, Kindia. ©C.Couch, RBG Kew