WEBBIA Journal of Plant Taxonomy and Geography

Firenze University Press
https://oaj.fupress.net/index.php/webbia

OPEN ACCESS

Citation: van der Burgt X., Tchatchouang E.N., Tchiengué B. (2025). *Haplocoelum aurantium*, Sapindaceae, a new tree species from submontane forest in Cameroon. *Webbia. Journal of Plant Taxonomy and Geography* 80(2): 239-244. doi: 10.36253/jopt-17848

Received: May 16, 2025

Accepted: June 20, 2025

Published: July 18, 2025

Data Availability Statement: All relevant data are within the paper and its Supporting Information files.

Competing Interests: The Author(s) declare(s) no conflict of interest.

Editor: Carel C. Jongkind

Haplocoelum aurantium, Sapindaceae, a new tree species from submontane forest in Cameroon

Xander M. van der Burgt[1,*], Eric Ngansop Tchatchouang[2], Barthélemy Tchiengué[2]

[1] *Herbarium, Royal Botanic Gardens, Kew, Richmond, TW9 3AE, United Kingdom*
[2] *IRAD – National Herbarium of Cameroon, PO Box 1601, Yaoundé, Cameroon*
*Corresponding author. Email: x.van.der.burgt@kew.org

Abstract. *Haplocoelum aurantium* Burgt, Ngansop & Tchiengué, Sapindaceae, is described and illustrated. It is a tree, to 18 m high, with a stem to 50 cm diameter, often overhanging. On mature trees the leaves usually have 8–18 leaflets; 40% of leaves have 14 or 16 leaflets. 28% of leaves have an odd number of leaflets. The leaflets are opposite, sub-opposite, or alternate. The flowers are unknown. The fruits are indehiscent, orange and globular, 1.5–2.3 cm diameter. *Haplocoelum aurantium* occurs in submontane forest, at 700–1400 m elevation. The tree species is endemic to Cameroon, in parts of the Littoral Region, Southwest Region and West Region. Twelve herbarium collections have been made, in an area of 7500 km^2. *Haplocoelum aurantium* is provisionally assessed as Vulnerable.

Keywords: Africa, endemic, *Haplocoelum*, Sapindaceae, vulnerable.

INTRODUCTION

Haplocoelum Radlk. is a genus in the Sapindaceae family, of small to medium sized trees, occurring in tropical Africa and southern Africa. There exist six accepted taxa: four species, one of which is divided into three subspecies (GBIF 2025; POWO 2025). *Haplocoelum acuminatum* Radlk. ex Engl. occurs in Congo (Kinshasa) and Northeast Angola, *Haplocoelum inopleum* Radlk. occurs in Somalia, Kenya, Tanzania and Mozambique, and *Haplocoelum intermedium* Hauman occurs in Gabon, Congo (Brazzaville), Congo (Kinshasa) and Western Tanzania. *Haplocoelum foliolosum* (Hiern) Bullock occurs from Cameroon to Ethiopia and to South Africa and is divided into three subspecies. Two formerly accepted species of *Haplocoelum, H. mombasense* Bullock and *H. strongylocarpum* Bullock, were ranked to subspecies of *H. foliolosum* (Friis et al. 1996; Davies and Verdcourt 1998), without providing evidence to support this. *Haplocoelum mombasense* was named to *H. foliolosum subsp. mombasense* (Bullock) Verdc. and *H. strongylocarpum* was named to *H. foliolosum subsp. strongylocarpum* (Bullock) Verdc.

Nine sterile herbarium specimens from Cameroon, seen at BR, K, P, WAG and YA were determined by the authors of the present study to belong to the genus *Haplocoelum*. Only two of these sterile specimens had already been named to this genus before, most specimens had been named to genera in other families. The authors were able to collect fruiting specimens in 2016 and 2019, when they visited the areas where two of the sterile specimens had been collected more than 10 years earlier. The authors have not seen any flowering plants. The authors also could not find an existing flowering herbarium collection of this species. The leaves of the two fruiting specimens differ from those of the other species of *Haplocoelum*. The new species of *Haplocoelum* is here described.

MATERIALS AND METHODS

Herbarium sheets from the herbaria BR, K, MO, P, WAG, YA were studied. All cited material was seen, as an herbarium specimen and/or as an image. Herbarium collections without co-ordinates on their labels were georeferenced with Google Earth (2025). The distribution map was made with Simplemappr (Shorthouse 2010). The morphological terminology follows that of Beentje (2016). All measurements of leaves were made on the two fertile collections only, *Burgt* 2383 and *Tchiengue* 3767. The number of leaflets per leaf, and the size of the leaflets of juvenile trees and saplings may be different from those of mature trees. Specimens made from juvenile trees and saplings were therefore not used in the descriptions, but they are still cited and appear in the distribution maps. A preliminarily IUCN extinction risk category was determined following IUCN criteria (2012, 2024).

RESULTS AND DISCUSSION

Haplocoelum aurantium Burgt, Ngansop & Tchiengué **sp. nov.** (Figure 1).

Type: Cameroon, Littoral Region, Ebo Proposed National Park, Bekob, 4° 21’ 30” N, 10° 25’ 00” E, 900 m, fr., 17

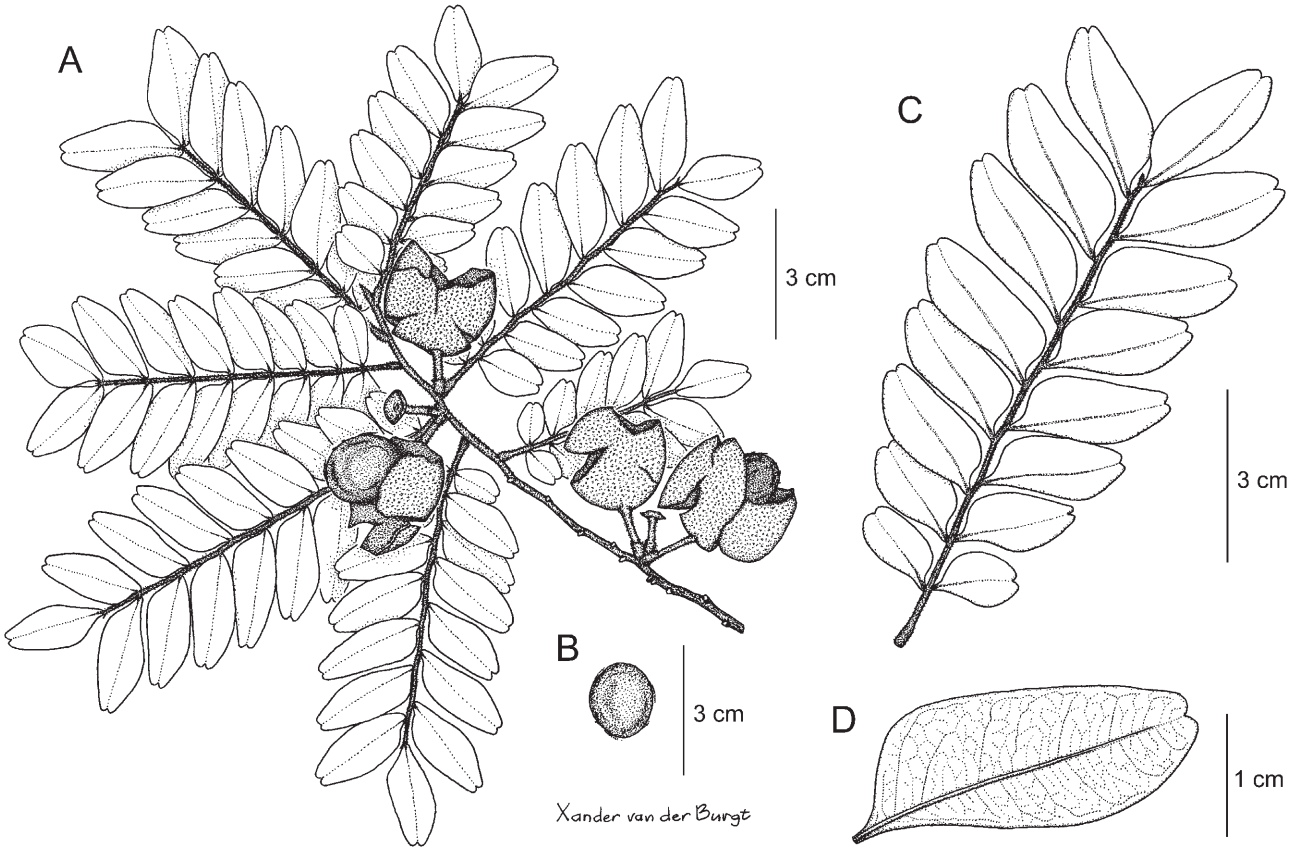


Figure 1. *Haplocoelum aurantium*. A Branch with leaves, fruits and seeds. B Seed. C. Leaf upper side. D Leaflet upper side. A – D from *Tchiengue* 3767 (K, YA). Drawing by Xander van der Burgt.

Figure 2. Stem of *Haplocoelum aurantium*. From *Burgt* 2383. Photo: Xander van der Burgt.

Figure 3. Leaves of *Haplocoelum aurantium*. From *Burgt* 2383. Photo: Xander van der Burgt.

Sep. 2016, *Tchiengue & Ekwoge* 3767 (holotype YA, isotype K001243774). (Figs. 1–4).

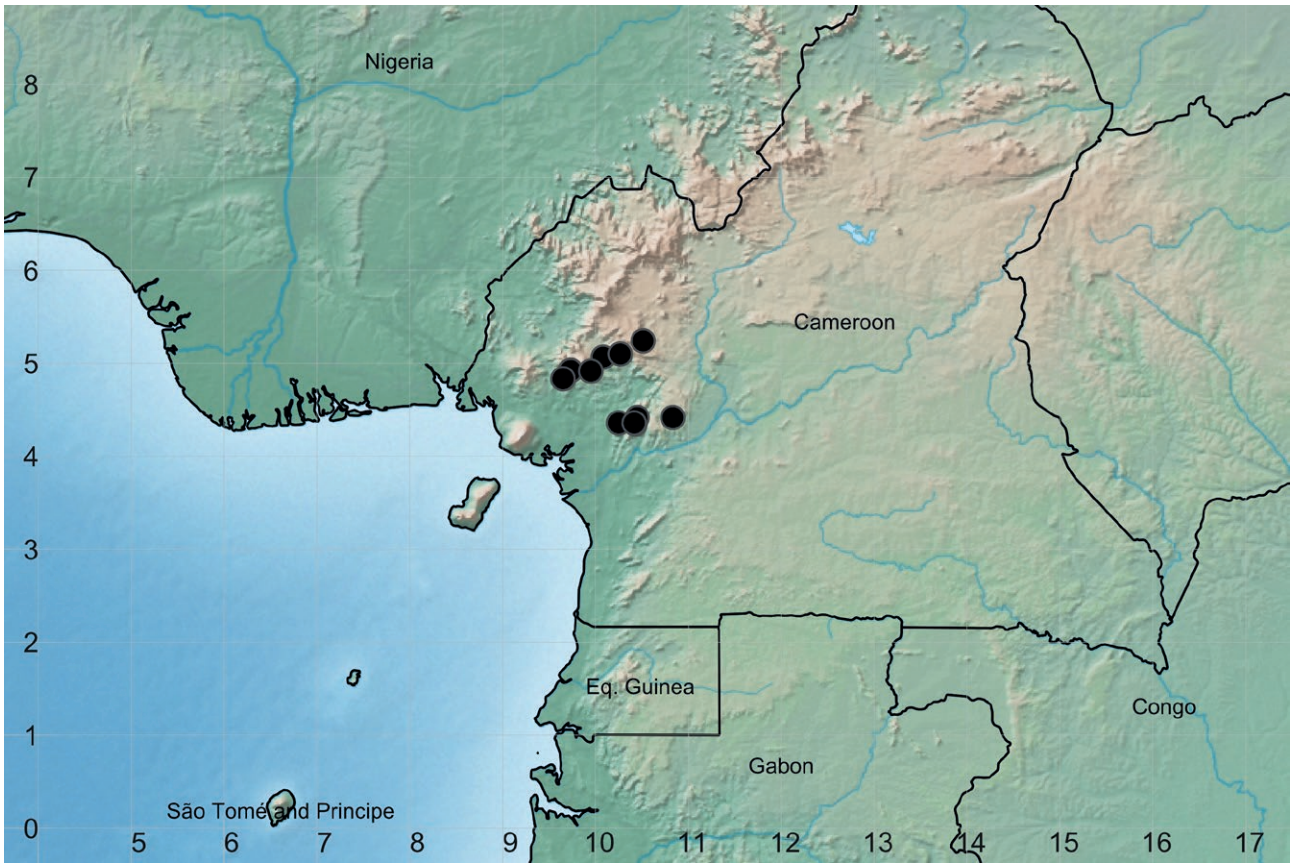
Diagnosis

Haplocoelum aurantium morphologically resembles *Haplocoelum intermedium* Hauman; a species from lowland forest in southern Gabon, Congo Republic and Democratic Republic of Congo. The largest leaflets of *H. aurantium* are 2–3.2 cm long, and they are located in the middle or the top of the leaf. The largest leaflets of *H. intermedium* are 2.5–5 (–7.1) cm long, and they are always located at the top of the leaf.

Description

Tree, to 18 m high, stem to 50 cm diameter, often overhanging. Bark smooth, grey-brown, lenticels numerous, same colour. Twigs densely pubescent with hairs to 0.3 mm long, older twigs glabrescent. Internodes 0.5–1.5 cm long. Leaves alternate, distributed evenly along the twig. Stipules absent. Leaves on mature trees 5–11.5 × 3–5 cm, petiole 0.7–1.2 cm long, rachis 2.5–7 cm long, narrowly winged, wings erect, 0.2 mm high, petiole and rachis densely hairy on both sides with hairs to 0.3 mm long, rachis wings glabrous; leaves paripinnate or imparipinnate; leaflets opposite, sub-opposite, or alternate, leaflets on mature trees (6–) 8–18 (–19), on juvenile trees to 26 leaflets, on mature trees 40% of leaves have 14 or 16 leaflets, 28% of leaves have an odd number of leaflets; petiolules up to 0.5 mm long or leaflets subsessile, densely hairy; leaflets obliquely oblong, apex deeply emarginate, margin entire and inrolled; largest, upper and middle leaflets 2–3.2 × 0.8–1.2 cm, smallest, lowest leaflets 1–1.6 × 0.6–1 cm; leaflet blade glabrous on both sides, midrib sparsely hairy to glabrescent on both sides; venation prominent on both sides, 8–12 pairs of secondary veins. Inflorescence and flowers unknown. Infructescence axillary, in leaf axils of extant and recently fallen leaves, 1–4 fruits; peduncle 2–6 mm long, 2 mm diameter, pedicel 4–7 mm long, 1.5 mm diameter, pubescent; fruit indehiscent, orange, globular, 1.5–2.3 cm diameter, glabrous, smooth, lenticels numerous; fruit not stipitate, remnants of sepals at base, apex apiculate, 0.5–1 mm long; epicarp woody, brittle, 0.3–0.5 mm thick; fruit probably developed from a 3-locular ovary, containing a single seed; seed ellipsoid, 14–18 × 12–15 × 7–9 cm, arillode almost completely covering the seed. Seedling epigeous, first pair of leaves opposite, with 10 leaflets each, leaflets 2–2.7 × 0.8–1 cm.

Figure 4. Old infructescence of *Haplocoelum aurantium* with the remains of four fruits. From *Burgt* 2383. Photo: Xander van der Burgt.



Map 1. Distribution of *Haplocoelum aurantium*.

Etymology

The genus *Haplocoelum* is named after the fruit haplo, simple and koilos, cavity (Fouilloy and Hallé 1973). The species *aurantium* is named after the orange colour of the fruits.

Distribution

Haplocoelum aurantium occurs in Cameroon, in parts of the Littoral Region, Southwest Region and West Region. The species is predicted to occur also in the western part of the Central Region, where there exist several hundreds of square km of submontane forest habitat within the extent of occurrence of the 12 collection localities, at distances between 5 km and 40 km to some of these 12 collecting localities.

Habitat

Haplocoelum aurantium occurs in submontane forest, at 700 – 1400 m altitude. The collection *Burgt* 2383 was made on steep bedrock at the edge of an inselberg (Fig. 2).

Ecology

Three old chimpanzee nests were seen in neighbouring trees at the collecting locality of *Burgt* 2383. Chimpanzees may be amongst the seed dispersers of *Haplocoelum aurantium*.

Conservation status

The extent of occurrence of the 12 herbarium collections of *Haplocoelum aurantium* is 7500 km^2. The area of occupancy of these 12 collections is 44 km^2. The extent of occurrence and area of occupancy should not only include the actually known sites, but also inferred or projected sites (IUCN 2024: p. 53). *Haplocoelum aurantium* occurs without doubt in many more localities, since there exist large areas of potentially suitable submontane forest habitat within and near the extent of occurrence (Google Earth 2025). The actual extent of occurrence may be estimated as more than 10000 km^2, but less than 20000 km^2. The actual area of occupancy may be estimated as more than 500 km^2, but less than 2000 km^2.

When comparing the 12 collection localities of *Haplocoelum aurantium* with a map of Cameroon's Forest Estate (MINFOF & WRI 2024), it appears that none of the 12 collection localities of *H. aurantium* is clearly located within a protected area. Several of the collections from the northern part of the distribution (Map 1) are close to one or more of the c. 10 forest reserves in this area. It is therefore likely that *H. aurantium* occurs in one or more of these forest reserves. The southern part of the distribution (Map 1) consists of an expanse of lowland and submontane forest of c. 110 km × 20 – 30 km. In this area there are no protected areas at all anymore. Four collections were made in the Ebo Proposed National Park. Two years ago, the Ebo Proposed National Park was converted into two logging concessions; this is not yet recorded on the map of Cameroon's Forest Estate (MINFOF & WRI 2024). *Haplocoelum aurantium* occurs in several IPA's (Important Plant Areas) in Cameroon (Murphy et al. 2023): in the Ebo Forest, in Mt Nlonako, and probably also in Mt Kupe and Mt Mwanenguba. This publication advises increased protection of the forest in these areas, by local communities as well as the Cameroon government.

Five mature trees of *Haplocoelum aurantium* were seen during the collecting of *Burgt* 2383, in the Ebo Proposed National Park, in sub-montane forest on steep bedrock at the edge of an inselberg (Fig. 2). Although an old logging road was seen at less than 1 km distance, the logging probably did not reduce the number of mature individuals of *H. aurantium* growing in an area too steep and rocky for logging vehicles. The tree species is not targeted by loggers, because the trees are too small to produce timber. This population of *Haplocoelum aurantium* is also safe from farming, because the nearest farmland is 10 km away and the area is far too rocky to be suitable for farming. Three other collections were made in the Ebo Proposed National Park, in remote areas with large expanses of closed forest (Google Earth 2025). However, eight of the 12 collecting localities are closer to farmland, near villages and roads, in forest that appears secondary on Google Earth (2025). It is likely that there has been decline in quality of habitat and in the number of mature individuals. Therefore, *Haplocoelum aurantium* is here preliminarily assessed as Vulnerable B1(iii,v)+B2(iii,v).

Notes

There occur no other species of *Haplocoelum* in the region where *H. aurantium* is found. The only other species of *Haplocoelum* occurring in Cameroon is *H. foliolosum*, a widespread species. This is a species from dry wooded grassland habitats, which occurs in Cameroon in the North Region, where the annual rainfall is much lower than in the distribution area of *H. aurantium*.

Flowers of *Haplocoelum aurantium* have not yet been collected. The flowers probably have the same morphology as those of the other species of *Haplocoelum* (as described in Davies & Verdcourt 1998; Exell et al. 1966; Fouilloy & Hallé 1973). If so, these flowers are small, about 0.5 cm long, with 5 to 6 sepals, no petals, and 5 or 6 stamens.

Sterile specimens of *Haplocoelum aurantium* have been confused with several species in the Leguminosae subfamily Detarioideae. Several sterile collections were found named, often with hesitation, to *Tessmannia anomala* (Micheli) Harms, *Tessmannia lescrauwaetii* (De Wild.) Harms, *Copaifera mildbraedii* Harms, *Hymenostegia* Harms, and *Plagiosiphon* Harms. Species of *Tessmannia* and *Copaifera* have numerous translucent dots in the leaflets; but species of *Haplocoelum* do not have translucent dots in the leaflets. Species of *Hymenostegia* and *Plagiosiphon* have opposite leaflets (the lower leaflets sometimes sub-opposite); while the leaflets of *H. aurantium* are often alternate. The leaflets of *H. aurantium* often have a slightly concave lower leaflet edge, which these species of Leguminosae-Detarioideae do not have. Sterile specimens of *Rourea obliquifoliolata* Gilg, Connaraceae, may also be confused with *H. aurantium*, but lower leaflet edge of *R. obliquifoliolata* is never concave, and the microscopic structure of the leaflet surfaces is different.

Additional specimens examined

CAMEROON. Littoral Region. Ebo Proposed National Park, hill 2 km northeast of Njuma Camp, 4° 21' 29.9" N, 10° 15' 0.4" E, 850 m, fr., 11 Dec. 2019, *Burgt, Alvarez & Ngansop* 2383 (B, BR, EA, FT, G, K, LISC, MO, P, PRE, SCA, SING, WAG, YA); Ebo Proposed National Park, Yingui, Ndokbaembi on N-S ridge, 4° 20' 52" N, 10° 25' 40" E, 820 m, sterile, 21 April 2005, *Cheek* 12465 (K); Ebo Proposed National Park, Iboty to Bekob village, 4° 25' N, 10° 27' E, 680 m, sterile, 14 Feb. 2006, *Cheek* 12910 (K); Nonn, route Ndom, Pont de Kikok, 45 km south of Ndikinimeki, sterile, 10 Dec. 1971, *Letouzey* 10728 (BR, P, YA); West slopes of Mont Nlonako, 5 km SSE Nkongsamba, sterile, 17 Mar. 1976, *Letouzey* 14453 (BR, K, YA); **Southwest Region**. Abang, Ngomboku, 4° 55' N, 9° 44' E, 850 m, sterile, 11 Dec. 1999, *Cheek* 10312 (K, P, WAG); same loc., 1000 m, sterile, 15 Dec. 1999, *Cheek* 10381 (K); Slopes NW of Ngusi, 15 km NNW of Tombel, sterile, 21 April 1976, *Letouzey* 14655 (K, P, YA); **West Region**. near Mounko, 20 km SW of Bafang, sterile, 21 Nov. 1974, *Letouzey* 13274 (P, YA); Badoumkassa to Balam, 12 km

ESE Bafang, sterile, 24 Nov. 1974, *Letouzey* 13316 (YA); Nde Department, Bangang Fokam Village, sterile, 2018, *Ngansop & Nana* 392 (K, P, WAG, YA).

ACKNOWLEDGEMENTS

This paper is a result of the partnership between Kew Gardens and the National Herbarium of Cameroon (MINRESI-IRAD). We thank the former directors Dr Jean Michel Onana, Florence Ngo Ngwe, Eric Nana and Jean Lagarde Betti. The Cameroon government gave permission to carry out research and permission to export the herbarium collections. The field research was partly funded by Garfield Weston Foundation, through the 'Global Tree Seed Bank Project' of Kew's Millennium Seed Bank Partnership. We thank the Banen people in the Ebo Forest region, and the Ebo Forest Research Project supported by the San Diego Zoo Wildlife Alliance, for supporting botanical surveys in the Ebo Forest in Cameroon.

REFERENCES

Davies FG., Verdcourt B. 1998. *Haplocoelum*. Pp. 43 – 47. In: Flora of Tropical East Africa, Sapindaceae.

Exell AW, Fernandes A, Wild H. 1966. *Haplocoelum*. Pp. 530 – 533. In: Flora Zambesiaca, volume 2, part 2.

Fouilloy R., Hallé N. 1973. Flore du Cameroun 16. Sapindacées. MNHN Paris. Pp. 202.

Friis I. Verdcourt B., Vollesen K. 1996. New combinations in African Sapindaceae. Kew Bulletin. 51: 802.

IPNI 2025. International Plant Names Index. Published on the Internet http://www.ipni.org The Royal Botanic Gardens, Kew, Harvard University Herbaria & Libraries and Australian National Herbarium. [Retrieved 17 January 2025].

IUCN 2012. IUCN Red List categories and criteria. Version 3.1. Second edition. Prepared by the IUCN Species Survival Commission. IUCN, Gland & Cambridge. https://www.iucnredlist.org/resources/categories-and-criteria

IUCN 2024. Guidelines for Using the IUCN Red List categories and criteria. Version 16. Prepared by the Standards and Petitions Committee of the IUCN Species Survival Commission. Published at https://www.iucnredlist.org/resources/redlistguidelines

MINFOF & WRI 2024. Cameroon's Forest Estate, December 2023. Map, published 10 May 2024. Cameroon Ministry of Forestry and Wildlife (MINFOF) & World Resources Institute (WRI). https://data.globalforestwatch.org/

Murphy B, Onana JM, van der Burgt X, Ngansop ET, Williams J, Tchiengue B, Cheek M. 2023. Important Plant Areas of Cameroon. Royal Botanic Gardens, Kew. 302 pp.

ShorthouseDP. 2010. SimpleMappr, an online tool to produce publication-quality point maps. Retrieved from https://www.simplemappr.net Accessed January 19, 2025.