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Assessment of Floristic Diversity Status of the Laikom Sacred Forest in the Boyo Highlands, North West Region, Cameroon

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ABSTRACT

The Laikom sacred forest, nestled in the Boyo highlands of Cameroon, is a biologically and culturally significant ecosystem. This study, conducted from February to July 2024, assessed the floristic diversity status of the 21.9 hectare forest, situated at altitudes between 1700 and 1975 meters. Using quadrats, data were collected across the sacred forest's four compartments: Aku-a-Mufu, Aku-a-Fuchuo, Aku-a-Beighe, and Aku-a-Chong. Results revealed a rich composition of 29 plant species belonging to 15 families. Fabaceae was the most dominant family with 07 species. The species provided a range of ecological and socio-cultural services, including timber (e.g., *Pterocarpus angolensis*, *Dalbergia sissoo*), medicinal (*Dracaena steudneri*, *Momordica dioica*), spiritual significance (*Ficus thonningii*, *Adansonia digitata*), fuel wood (*Delonix regia, Prunus africana*), and erosion control (*Desmodium uncinatum*). Ecological indices indicated good species diversity (Shannon-Wiener index H = 3.1) and evenness (Simpson index D = 0.95) As deduced from Margarlef index the forest was semi-disturbed. A total of 303 individual plants were recorded, with six species classified as abundant and five as endangered, including *Acer palmatum* and *Magnolia stellata*, highlighting the need for urgent conservation. The Laikom sacred forest remains a hotspot of floristic diversity, sustaining ecological stability and traditional practices in the Kom Fondom. However, anthropogenic pressures threaten its rare and endangered species. Policy interventions should prioritize community-based conservation, integration of traditional ecological knowledge into forest management, and reinforcement of sacred forest governance systems. Sustainable use and protection of this unique forest will ensure its continued role in biodiversity conservation and cultural heritage preservation in Cameroon.

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KEYWORDS: Boyo highlands, conservation, ethnobotany, floristic diversity, sacred forest, species richness

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1. INTRODUCTION

Biodiversity made up of terrestrial, marine, and other aquatic ecosystems, is a critical indicator of ecosystem health and resilience (Wang et al., 2021; Sharma and Birman, 2024). In Africa, biodiversity plays a central role in sustaining ecological balance and supporting livelihoods through the provision of food, medicine, fuel, and raw materials (Fayiah and Fayiah, 2022; Saliu et al., 2023). The continent is home to a wealth of flora and fauna, much of which is endemic and tied closely to the cultural and spiritual values of local communities (Kelbessa, 2022). In many African societies, forests are more than just ecological zones as they are sacred spaces integral to traditional belief systems and community governance (Alifa, 2023). These sacred forests often serve as biodiversity hotspots, protected from exploitation through customary norms and spiritual taboos, effectively making them traditional conservation models (Shiferaw et al., 2023). Across Africa, especially in regions with strong indigenous governance structures, sacred forests have historically played a role in preserving rare and ecologically valuable species. As custodians of cultural heritage and biodiversity, these forests are managed through community-sanctioned rules, often prohibiting deforestation, hunting, and non-ritual human activity (Mgaya, 2023; Amanze, 2024; Gbadegesin and Gbadamosi, 2024). However, these systems are increasingly under threat due to socio-political changes, population growth, agricultural expansion, and weakening of traditional authority

structures (Roba, 2021; Nyagwalla Otieno et al., 2023). Consequently, there is a growing need for scientific studies that document the biodiversity status and ecological value of these sacred spaces, while also recognizing their socio-cultural importance.

Cameroon is rich in forest resources that span across several ecoregions, from mangroves in the coastal areas to tropical rainforests in the Congo Basin and montane forests in the western highlands (Ajonina, 2022). The country's forest ecosystems harbor over 9,000 plant species, of which a significant proportion is endemic (Murphy et al., 2023). Forest plants play vital roles in local economies and traditional medicine, while also supporting forest structure and function (Kengne et al., 2022). Yet, deforestation and land degradation remain pressing challenges. Between 2001 and 2020, Cameroon lost over 1.5 million hectares of forest, largely due to logging, agricultural encroachment, and infrastructural development (Atyi, 2022). While national parks and protected areas exist, they often overlook smaller community-managed or sacred forests that contribute significantly to biodiversity conservation and cultural preservation (Lang, 2024). In the Western Highlands of Cameroon, the montane and sub-montane ecosystems of the Bamenda Highlands – part of the Western Highlands of Cameroon, are known for their exceptional biodiversity and endemism (Awazi, 2025). These highland areas, ranging from 1,000 to 2,600 meters in elevation, are home to unique floristic assemblages adapted to the cool and moist climate (Awazi et al., 2024). However, the region faces intense anthropogenic pressure due to population density, land use conversion, and climate variability. As traditional land use systems give way to modern agricultural practices, the ecological and cultural integrity of forested areas is increasingly compromised (Ewane, 2021; Ewane et al., 2023). Amidst this trend, sacred forests in the region, often located near palaces or shrines, have remained relatively intact due to traditional restrictions on access and use (Tiokeng et al., 2024). The Boyo Highlands, a sub-region of the Bamenda Highlands, are a crucial ecological corridor with a mix of natural forests, agroforestry systems, and sacred groves. This area is not only ecologically significant but also deeply rooted in the cultural traditions of the Kom people, one of the largest ethnic groups in the region (Dzeawoni, 2023; Womei et al., 2024).

The Kom Fondom, with its seat at Laikom, maintains strong traditional governance and spiritual practices, many of which are tied to the use and management of forest resources. The Laikom Sacred Forest, covering approximately 21.9 hectares and located at elevations between 1,700 and 1,975 meters, is one such forest that holds spiritual, cultural, and ecological importance. Comprising four distinct compartments – Aku-a-Mufu, Aku-a-Fuchuo, Aku-a-Beighe, and Aku-a-Chong – the forest is protected by ritual practices and managed by spiritual wardens and traditional institutions under the authority of the Kom Palace. Historically, the Laikom Sacred Forest has served as a center for religious worship, ritual cleansing, and the installation of traditional leaders. It also acts as a repository of medicinal plants, wildlife habitats, and sources of construction materials and food for ritual use. Despite its significance, the forest remains largely undocumented in scientific literature, particularly regarding its floristic diversity status and the drivers influencing the distribution of its flora. Previous studies in similar montane sacred forests in Cameroon and across Africa have demonstrated that these sites can harbor rare and endemic species not found in adjacent agricultural or secondary forests. In this context, understanding the plant species diversity of the Laikom Sacred Forest is critical for both ecological assessment and cultural preservation. The present study therefore aimed to assess the floristic diversity status of the Laikom Sacred Forest in the Boyo Highlands of Cameroon.

2. MATERIALS AND METHODS

2.1. Description of the study area

This study was conducted in the Laikom sacred forest from February 2024 to July 2024. The sacred forest is located in Laikom, at an elevation ranging from 1700 m to 1975 m. It is situated between latitudes 6°16'30" N and 6°17'0" N, and longitudes 10°19'20" E and 10°19'50" E, respectively (Figure 1). Covering an area of 21.9 hectares, the forest is part of the Bamenda Highlands Forests and holds significant socio-cultural, economic, and ecological value for the people of Laikom and the broader Kom Fondom. The sacred forest lies on the outskirts of the Kom palace in Laikom, which serves as the traditional center of the Kom Fondom in Fundong Subdivision, Boyo Division, North West Region of Cameroon. It is bordered by the Ijim plateau to the east, Fujua village to the west, Abuh to the north, and Yang to the south. Although the forest is located in Laikom, the study includes respondents from the surrounding villages of Fundong, Njinikom, and Belo, all of which rely on Laikom as the seat of the Fondom for traditional administrative matters.

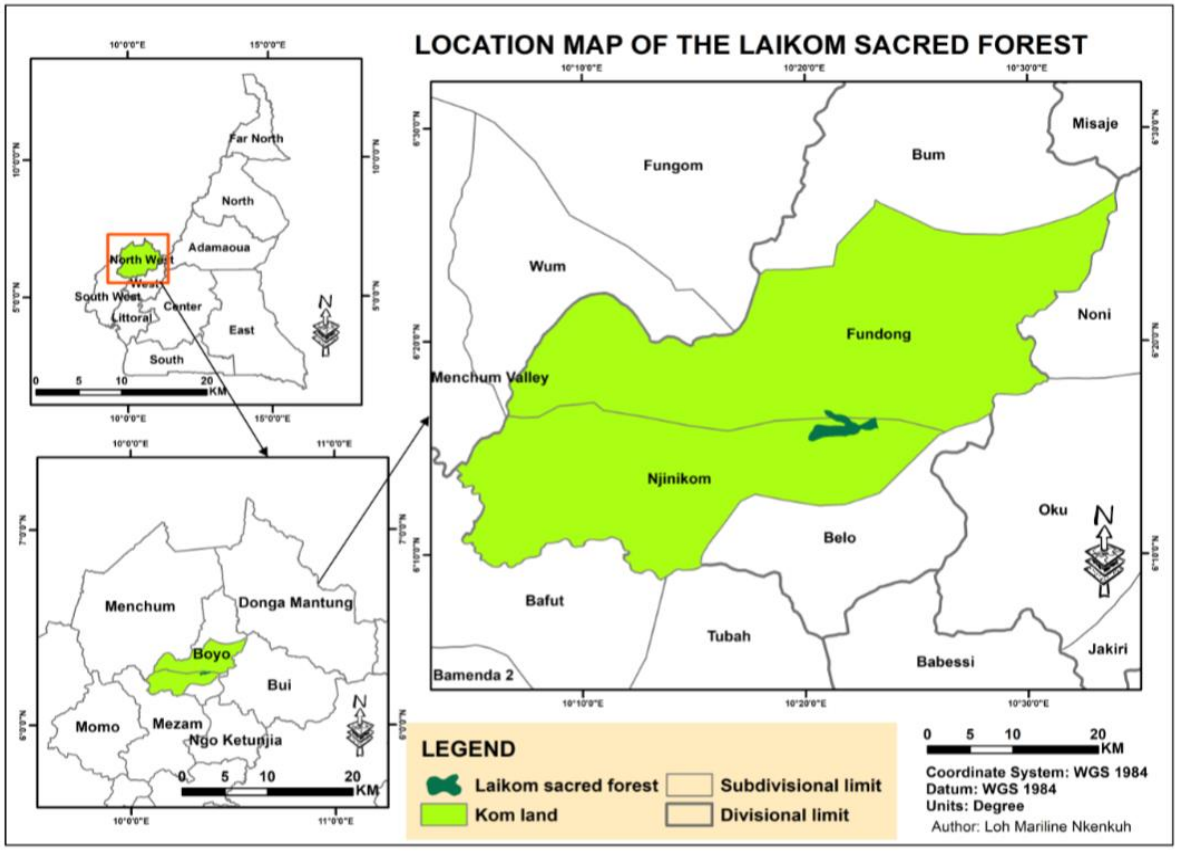

Figure 1: Location of Laikom in Fundong Subdivision, Boyo Division, North West region, Cameroon

The climate in Laikom, located within Fundong Subdivision, is characterized by two distinct seasons. The rainy season, which lasts from mid-March to mid-October, is marked by heavy rainfall exceeding 2,800 mm and relative humidity around 82 %. The average annual rainfall is approximately 2,400 mm. The dry season spans from mid-October to mid-March and is defined by dry, dusty conditions, with temperatures ranging from 15°C to 27°C, and a mean annual temperature of 21°C. The coolest month in the region is August. However, like many other regions around the world, Laikom has been experiencing unpredictable weather patterns and seasonal changes, which are attributed to the effects of global warming and climate change, as highlighted by the 2018 Fundong Council Development Plan.

In terms of relief and hydrology, the Kom region is known for its hilly terrain, interspersed with valleys and steep escarpments, with basalt rock types predominating in the area. Laikom lies on the western slopes of a ridge that leads to the Ijim forest, which ends in a striking escarpment made of basalt. Laikom's relief is marked by slopes ranging from 40% to 70%. These topographical features are integral to the community's land use, with highland areas being used for grazing and the fertile valleys serving as cultivable lands. The area also features tropical swamps that contribute to the region's biodiversity. The area is drained by several streams, with Laikom itself being served by two main streams, Jua Molombo and Jua Aku-a-Mufu. The region is also a catchment area, with various springs that provide drinking water to the local population, including the Ikui, Achaff, and Itsinala springs. Recently, a piped water supply has been sourced from a spring in Ijim to serve the community.

The soils in the Laikom area are mostly well-drained and range from moderately dark to light brown in color, with some areas containing clay loam or clay soils. These soils are primarily Cambisols, rich in weathered minerals, and are found on steep footslopes, hills, and uplands. At lower elevations, Lixisols and Arenosols are common, particularly in low-lying areas. The soils are fertile and ideal for cultivating a variety of rain-fed crops such as beans, maize, cocoyam, soya beans, Irish and sweet potatoes, cassava, and vegetables. This rich soil contributes significantly to the agricultural activities in the region.

Laikom's vegetation is characterized by a mix of humid montane forests, situated at an altitude of approximately 1,800 m above sea level. The flora is diverse, with many species of trees, shrubs, herbs, grasses, and climbers. Notable plant species found in the Laikom sacred forest include *Maesa lanceolata, Agauria salicifolia, Ficus lutea, Adansonia digitata, Ficus thonningii,* and *Sida acuta*. The area also features tropical grasslands or humid savannah, with forest woodlands and regrowth, as well as areas of savannah with grass and shrubs. A dense montane forest known as Aku-a-Ngei, or giraffe forest, is part of the adjacent Ijim montane forest. In addition to the natural vegetation, there are plantations around the homesteads, where crops such as coffee, plantains, bananas, kola nuts, pears, mangoes, and sometimes Eucalyptus trees are grown. The Laikom sacred forest, located between 1,925

and 1,975 m above sea level, represents the densest and richest ecosystem in the area. Many indigenous species from the forest, particularly those like *Ficus* species, are harvested for carving and medicinal purposes.

In terms of fauna, Laikom is located near the Kilum-Ijim Forest, which is considered a biodiversity hotspot and an important endemic bird area in the Bamenda Highlands of Cameroon. The sacred forest is home to a variety of animal species, including the bushbaby (*Galago alleni*), the montane duiker (*Cephalophus monticola*), the African civet, Bannenman's turaco, grey-headed sparrows, swallow birds, hawks, and weaver birds. Other animals found in the area include antelopes, deer, and a range of primates, including monkeys and baboons. However, due to rapid population growth and environmental degradation, many of these species are increasingly vulnerable, with some facing the threat of extinction. The forest also hosts minor species such as reptiles, including agama lizards and snakes, as well as insects like butterflies, grasshoppers, wasps, and bees, along with amphibians like frogs. These species contribute to the region's rich ecosystems.

The hydrology of the region is complex, with rivers, streams, and springs draining the area. Fundong Subdivision, where Laikom is located, is traversed by several major rivers such as Nkoini, which forms the natural boundary between Fundong and Njinikom subdivisions, and Jviaffief, which originates in Ijim Forest and flows through various villages, including Fujua, before reaching Menchum. Other significant rivers include Jvia Ngwa, which separates Fundong from ZOA Council, and Jvia Ngunabum, which joins the River Kimbi. The area also has several springs and waterfalls of note, such as the Laikom, Akeh, and Ajung waterfalls, which add to the natural beauty and ecological significance of the region.

The Kom Fondom, which is believed to have been founded around 1730, is rich in history, with the Laikom sacred forest and the mythical python being tied to the Kom people's migratory history. According to oral traditions, the Kom ancestors migrated from Ndobo in North Cameroon, alongside other Tikar groups, to escape jihads. They initially settled in Babessi, but due to an act of betrayal, they eventually moved to Laikom around 1730, where they established their present settlement. This migration and the emergence of the sacred forest are deeply embedded in the history and culture of the Kom people. The Laikom sacred forest is a natural forest located near the Laikom palace, and it is divided into four distinct compartments: Aku-a-Mufu, Aku-a-Fuchuo, Aku-a-Beighe, and Aku-a-Chong. This forest is not only a natural reserve but also serves as a sacred site, where religious worship, ritual practices, and cultural events take place, all aimed at safeguarding the land and its productivity, as well as protecting human life. The forest was established when the Kom people arrived from Babessi around the 1730s and has since been a place for religious, ritual, spiritual, and cultural activities focused on preserving the land and defending it against evil spirits. While the forest itself is situated in Laikom, its influence extends throughout the Kom Fondom, with several of the chief priests and forest wardens selected from various villages within the Fondom as part of a traditional process. Some of the chief priests are appointed, while others are volunteers, similar to the royal guards of the Laikom palace, who are known as Nchisintoh in Kom.

2.2. Data collection

Data were collected from four sacred forest compartments namely Aku-a-Mufu, Aku-a-Fuchuo, Aku-a-Beighe, and Aku-a-Chong. Four 10 ×10 m quadrats established at 25 m intervals (Figure 2). Plant species recorded alongside their frequency of occurrence. The plant identification was achieved with the help app known as PlantNet which had been pre-tested to ascertain accuracy of results. Those which could not be identified in the field were pressed in newspapers and sent to the National Herbarium of Cameroon for proper identification.

2.3. Data analysis

The indices outlined below were computed from the data. All the analyses were done using in Microsoft Excel 2013.

i. Margalef species richness index (d)

$$d = \frac{s-1}{In\ N} \quad \text{..... (1)}$$

Where d =Margalef index (measure of species richness); S = total number of species; N = total number of individuals in the site; In = natural logarithm (Margalef, 1958).

ii. Shannon-Wiener diversity index (H)

$$H = -\sum Pi\ In\ Pi \quad \text{.....(2)}$$

where; Pi = proportion of individuals found in the species i; In = natural logarithm (Shannon and Wiener, 1949).

The method developed by Hussain et al. (2012) for rating biodiversity was adopted for inferring the values of H and d (Table 1).

Table 1: Ranges for evaluating ecological indices

Shannon-wiener index (0-5)		**Margalef index (0-5)**	
Range	**Status**	**Range**	**Status**
<4-5	High	>5	Integrated
<3-4	Good	2.05-5	Semi disturbed
<2-3	Moderate	<2.05	Disturbed
<1-2	Poor		
0-1	Bad		

iii. Relative Density (RD)

$$RD = \frac{Ns}{Nt} \times 100 \quad (3)$$

where Ns = number of individuals of species i; NT = total number of individuals of all species. The biodiversity status of each species was determined from its RD.

Following the protocol described by Ambebe et al. (2021), the biodiversity status of the various species was defined on the basis of their relative densities (RD) as follows:

- Abundant (RD ≥ 5.00)
- Frequent (4.00 ≤ RD ≤ 4.99)
- Occasional (3.00 ≤ RD ≤ 3.99)
- Rare (1.00 ≤ RD ≤ 2.99)
- Endangered (0.00 < RD ≤ 1.00)

iv. Simpson's diversity index (D)

$$D = \sum_{i=1}^{s} \frac{Ni(Ni-1)}{(N(N-1)} \quad (4)$$

D ranges from 0 to 1 where 0 indicates the absence of diversity and 1 absolute diversity. Values close to 1 show a community of many species with equally low abundances while those close to 0 express fewer species with one of them clearly dominant (Simpson, 1949).

3. RESULTS

3.1. Laikom sacred forest floristic composition

The results revealed that Laikom sacred fForest was characterized by a diverse range of species. A total of 29 species consisting of 17 trees, 3 shrubs and 9 herbs were recorded, representing 15 families (Table 2). Fabaceae that ranked highest in number of species (7) was closely followed by Malvaceae (4). With the exception of Asparagaceae, Malvaceae with 3 species each and Euphorbiaceae with 2, all other families were represented by a species. The flora provides various benefits, including timber from species like *Pterocarpus angolensis, Dalbergia sissoo, Entada gigas* as well as medicine from *Jathropha curcas* and *Hedychium coronarium*. The forest also produces edible fruits from species like *Ficus lutea, Ficus vogelii,* and *Momordica dioica*. Other species like *Ficus thonningii* and *Adansonia digitata* are of cultural and spiritual importance. Also notable is the role of roots of trees like *Desmodium uncinatum* in erosion control. There are several other uses attributed to the floristic of the Laikom sacred forest (Table 2).

Table 2: Flora of the Laikom sacred fores and their uses

S/N	Family	Scientific name	Common name	Local Name	Number of individuals	Growth habit	Use
1	Moraceae	*Ficus lutea*	Dahomey rubber tree	Ajeng	5	Tree	Medincine, furnitures, dye
2	Ericaceae	*Agauria salicifonia*	Willow tree agauria	Ijuo'	7	Tree	Dye, furniture, weaving,
3	Moraceae	*Ficus vogelii*	Redwood fig	Aloyn	9	Tree	Furniture, medicine
4	Moraceae	*Ficus capensis*	Bush fig	Akainii	12	Tree	Medicine
5	Commelinaceae	*Commelina camerunensis*	Day flower	Ikii-kiyung	5	Herb	Medicine
6	Rubiaceae	*Rytigynia sp*	African violet	Fi' kuli	6	Herb	spiritual protection
7	Fabaceae	*Pterocarpus angolensis*	African teak	Fi ka fasignii	3	Tree	Furniture , antioxidant, antibac…
8	Fabaceae	*Desmodium uncinatum*	Silver leaf	Fifvemmakoe '	20	Shrub	Erosion control, drains waterlogged soil
9	Fabaceae	*Samanea saman*	Cow-tamarind	Small leaf	30	Shrub	Medicine
10	Fabaceae	*Delonix regia*	Flamboyant	Iyes	8	Tree	fodder, nectar, fuelwood
11	Malvaceae	*Urena lobata*	Hibiscus burr	Shieme 1	19	Herb	Medicine
12	Primulaceae	*Maesa lanceolata*	False assegai	Gvem	5	Tree	medicine used to detect if one is a witch
13	Theaceae	*Prinus africanan*	African cherry	Sola	10	Tree	medicine, fuelwood
14	Brassicaceae	*Sinapis alba l.*	White mustard	Fiwing	20	Herb	Medicine
15	Moraceae	*Ficus thonningii*	Small fig tree	Figvem	15	Tree	Furniture, timber, medicine
16	Euphorbiaceae	*Jathropha curcas*	Purging nut	Atem	6	Tree	Medicine
17	Malvaceae	*Sida acuta*	Wireweed	Shieme 2	30	Herb	medicine, fodder
18	Fabaceae	*Senegalia ataxacantha*	Flame acacia	Filung	10	Tree	Furniture and medicinal
19	Euphorbiaceae	*Hura crepitans (L)*	Sand-box tree	Fi'ka'Fi sunjungnjung	6	Tree	Ornamentals, construction
20	Malvaceae	*Adansonia digitata L*	Baobab tree	Iboumambou m	15	Tree	Furniture, medicinal, shade
21	Magnoliance	*Magnolia stellata*	Star magnolia	Afei'wong	2	Tree	Relieving tension, and relaxation
22	Sapindaceae	*Acer palmatum*	Japanese Marple	Mbang kuna'	1	Shrub	Medicine
23	Fabaceae	*Dalbergia sissoo*	Rosewood tree	Injung	2	Tree	Furniture, production of xylophone
24	Zingiberaceae	*Hedychium coronarium J.*	Butterfly-ginger	Achou'h	10	Herb	Medicine
25	Cucurbitaceae	*Momordica dioica roxb*	Spine gourd	Fe'ghaghi	15	Herb	medicine, detoxify the body
26	Fabaceae	*Entada gigas*	Nicker-bean	Ffi'ka fi me'ssii	5	Tree	Medicine
27	Asparagaceae	*Dracaena trifasciata*	Snake plant	Ilang'	3	Herb	Medicinal and rituals

28	Asparagaceae	*Dracaena steudneri*	Dragon-tree	Achomchom	4	Tree	Traditional rituals, injunction order
29	Asparagaceae	*Dracaeca diesteliana*	Peace plant	Keng	20	Herb	Used in performing rituals and cleansing

3.2. Floristic diversity status of Laikom sacred forest

The results presented a total of 303 individuals from the 29 species in the Laikom sacred forest. The value of Shannon-Wienner diversity index indicated that the ecosystem was of good diversity (Table 3). Accordingly, the Simpson index that was close to 1 showed that though diverse, the the abundances of the individual species in the Laikon sacred forest were low, ranging from 0.003 to 0.099. When corrected for determination of ecological status on the scale of 0 - 5, Margalef index was 2.4; this indicated that the forests were semi-disturbed (Table 2, 3).

Table 3: Number of individuals (*S*), Relative Abundance (P_i), and Margalef (*d*), Shannon-Wienner (*H*) and Simpsons (*D*) indices

S/N	Tree species	*S*	P_i	*d*	*H*	*D*
1	*Ficus lutea*	5	0.016502	0.700067738	0.067728	0.000272304
2	*Agauria salicifonia*	7	0.023102	1.050101607	0.087045	0.000533717
3	*Ficus vogelii*	9	0.029703	1.400135476	0.104451	0.000882266
4	*Ficus capensis*	12	0.039604	1.925186279	0.127874	0.001568474
5	*Commelina camerunensis*	5	0.016502	0.700067738	0.067728	0.000272304
6	*Rytigynia sp*	6	0.019802	0.875084672	0.077663	0.000392118
7	*Pterocarpus angolensis*	3	0.009901	0.350033869	0.045694	9.80296E-05
8	*Desmodium uncinatum*	20	0.066007	3.325321755	0.179406	0.004356871
9	*Samanea saman*	30	0.099010	5.0754911	0.228964	0.00980296
10	*Delonix regia*	8	0.026403	1.225118541	0.095955	0.000697099
11	*Urena lobata*	19	0.062706	3.15030482	0.173652	0.003932076
12	*Maesa lanceolata*	5	0.016502	0.700067738	0.067728	0.000272304
13	*Prinus africana*	10	0.033003	1.57515241	0.112579	0.001089218
14	*Sinapis alba L.*	20	0.066007	3.325321755	0.179406	0.004356871
15	*Ficus thonningii*	15	0.049505	2.450237083	0.148796	0.00245074
16	*Jathropha curcas*	6	0.019802	0.875084672	0.077663	0.000392118
17	*Sida acuta*	30	0.099010	5.0754911	0.228964	0.00980296
18	*Senegalia ataxacantha*	10	0.033003	1.57515241	0.112579	0.001089218
19	*Hura crepitans L.*	6	0.019802	0.875084672	0.077663	0.000392118
20	*Adansonia digitata L.*	15	0.049505	2.450237083	0.148796	0.00245074
21	*Magnolia stellata*	2	0.006601	0.175016934	0.033139	4.35687E-05
22	*Acer palmatum*	1	0.003300	0	0.018857	1.08922E-05
23	*Dalbergia sissoo*	2	0.006601	0.175016934	0.033139	4.35687E-05
24	*Hedychium coronarium J.*	10	0.033003	1.57515241	0.112579	0.001089218
25	*Momordica dioica roxb*	15	0.049505	2.450237083	0.148796	0.00245074
26	*Entada gigas*	5	0.016502	0.700067738	0.067728	0.000272304
27	*Dracaena trifasciata*	3	0.009901	0.350033869	0.045694	9.80296E-05
28	*Dracaena steudneri*	4	0.013201	0.525050803	0.057128	0.000174275
29	*Dracaena diesteliana*	20	0.066007	3.325321755	0.179406	0.004356871
	Total	**303**	**1.000000**	**47.95464004**	**3.1068**	**0.946356022**

3.3. Floristic diversity status of plant species in Laikom sacred forest

The results showed a varied distribution of relative density and, consequently, floristic diversity status of individual species in Laikom Sacred Forest (Figure 2). Of the 29 species, 05 were endangered (*Dracaena trisfasciata, Dalbergia sissoo, Acer palmatum, Magnolia stellata*, *Pterocarpus angolensis*) while 06 were abundant (*Dracaena diesteliana, Sida acuta, Sinapis alba L, Urena lobata, Samanea saman*, and *Desmodium uncinatum*). Between these extremes were 11 species in the rare (*Dracaena steudneri, Entada gigas, Hura crepitans L, Jathropha curcas, Maesa lanceolata, Delonix regia, Rytighnia sp, Commelina camerunensis, Ficus vogelli, Agauria salicifonia, Ficus lutea*) and 04 in the occasional (*Hedychium coronarium J, Senegalia ataxacantha, Camellia*

sinensis Ficus capensis) categories. The remaining 03 (*Momordica dioica roxb, Adansonia digitata L, Ficus thonningii*) were frequent (Figure 2).

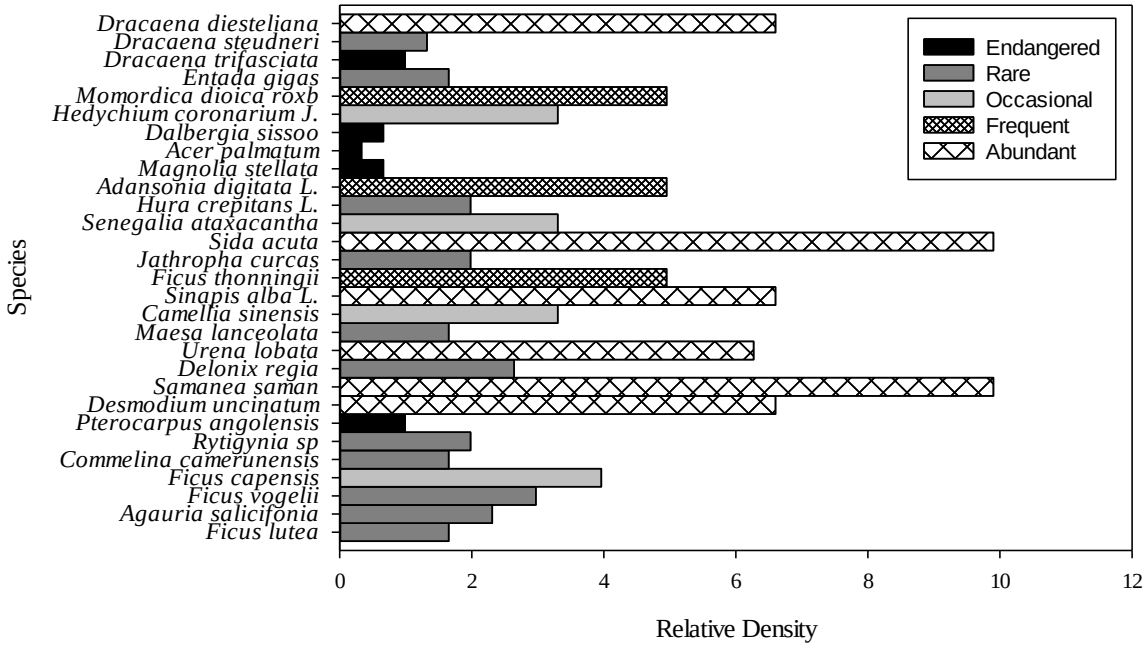

Figure 2: Floristic diversity status of individual species as determined from relative density

4. DISCUSSION

Floristic inventories remain an important aspect of assessing floristic composition, forest diversity and forest health (Noumi, 2012; Ngnigniwou et al., 2021; Njilin et al., 2024). They provide valuable insights into the structure, function, and dynamics of forest ecosystems, enabling researchers and managers to identify and assess plant species, diversity, richness and abundance present in the area (Yemata and Haregewoien, 2022). The findings presented a total of 29 species belonging to 15 families. However, the studies of Noumo and Tiam (2016), in Oku Sacred Forest in the North West region of Cameroon found higher number of species with 31 species belonging to 19 families.

The number of species encountered in this study was lower than that in dry afro-montane forests in Ethiopia as reported by Haile et al. (2021) – 87 species, Maryo et al (2023) – 70 species, and Haile et al. (2025) – 44 species. It is, however, comparable to 34 species of Kifle et al., (2022) and higher than 24 species of Kassa et al. (2025). The reason for the poor establishment of some families may be attributed to anthropogenic activities. The vegetation of Laikom sacred forest is under threat from grazing, bushfire, natural factors (wind, lightning and drought) and other anthropogenic activities. A study by Abera et al. (2024) aligned to these factors where human population continue to grow, land use intensity increases and the negative effects of deforestation are likely to worsen. Another reason for low species count might be dominance of few tree species over the others i.e. species lack equal chances for competition.

Alemayehu et al. (2010) in their study of Church forests had found values of H, d and D for different plots and he attributed low species diversity and richness in a community to select utilization of some species, high disturbance and variable conditions for regenerations. In the present study, however, the ecosystem was only semi-disturbed which likely did no result lead to a marked decline in diversity. While climatic and anthropogenic factors have broad effects on diversity across the landscape, biological factors and availability of suitable environmental gradients seem to influence species diversity more at the site levels (Sinthumule, 2024; Gyedu et al., 2023).

A study conducted by Adedibu et al. (2022) found out that tree species composition in Savannas were influenced by factors such as climate, soil type and disturbances regime Although trees constituted the dominant growth habit in the Laikom sacred forest, there were representations of shrubs and herbs which may, in combination, influence ecosystem processes like primary production and nutrient cycling. Chidumayo (2022) reported that herbs that are typically at the lowest layer of the forest thrive in shaded conditions with adaptations like large leaves and fleshy stems to optimize photosynthesis and water storage

The Laikom sacred forest's cultural significance has also shaped its composition, with some species holding spiritual or medicinal value. A study by Legesse and Negash (2021) and Eibl et al. (2024) noted that flora composition especially herb species composition in agroforestry systems is influenced by the management practices, with species like *Taraxacum officinale* and *Plantago lanceolata* being common in shaded ecosystems. Most species in Laikom sacred forest, serve more than one function; for example in addition to its main function as fuel wood, *Delonix regia, Hura crepitans* are widely used by the people of Kom in the manufacture of tool

handles (hoes, spears, axes, cutlasses and knives). This aligned with Todou et al. (2023) who highlighted that tree species uses vary from one species to another, but the wood and the leaves of trees are most in demand by the local communities. The uses of these species include; shade, timber, fuel, ornamentals, medicine, dyes and fodder. In many indigenous cultures, and Laikom in particular, specific trees or plants are deemed sacred, leading to their safeguarding through customary regulations and ceremonies. Notably, certain tree species like *Desmodium uncinatum, Samanea saman,* and *Sida acuta* have higher counts and relative abundances, impacting the overall diversity indices. These species play a significant role in shaping the ecological richness and distribution of trees in the area.

5. CONCLUSION AND POLICY IMPLICATIONS

5.1 Conclusion

The findings of this study underscore the ecological, cultural, and spiritual significance of the Laikom Sacred Forest within the Kom Fondom of the Boyo Highlands in Cameroon. With a total of 29 plant species recorded across 15 families, the forest demonstrates a good floristic diversity status. The forest not only serves as a reservoir of biodiversity but also provides crucial ecosystem services such as soil stabilization, microclimate regulation, and wildlife habitat. Moreover, it has deep-rooted cultural and spiritual value, functioning as a site for rituals, religious observance, and cultural continuity among the Kom people. Many species identified are integral to traditional medicine, crafts, food, and spiritual protection, linking biodiversity directly to the livelihood and belief systems of the local population. However, despite the benefits it offers, the forest faces increasing threats due to population pressure, land use change, unsustainable harvesting, and weakening traditional governance systems. Species such as *Pterocarpus angolensis*, *Dalbergia sissoo*, *Magnolia stellata*, and *Acer palmatum* were identified as endangered, and several others were categorized as rare or occasional. These trends signal an urgent need for proactive conservation measures to protect the forest's integrity and its vulnerable species.

5.2. Policy implications

Drawing from the findings of this study, the main policy implications are community-based forest management, integration of traditional knowledge, establishment of a local biodiversity monitoring framework, alternative livelihood support, legal recognition and protection, as well as education and raising awareness.

- Traditional authorities and local communities should be empowered and engaged in managing and conserving the forest. Strengthening the role of cultural institutions such as the palace council, spiritual wardens, and chief priests in forest governance can ensure respect for customary rules that have historically protected the forest.
- Conservation strategies must recognize and integrate the rich indigenous knowledge systems that inform the sustainable use of forest resources. This can be formalized through local development plans, educational campaigns, and collaborative research initiatives.
- A structured monitoring system should be developed to assess species population trends, particularly for endangered and rare species. This would guide timely interventions and track the effectiveness of conservation efforts.
- To reduce pressure on forest resources, policies should promote alternative income-generating activities such as agroforestry, beekeeping, and eco-tourism. These alternatives can provide economic incentives for conservation while preserving biodiversity.
- The Laikom Sacred Forest should be recognized under national and local conservation frameworks. Its status as a cultural heritage site should be formalized to enhance legal protection and attract funding for conservation efforts.
- Environmental education programs targeting schools, youth groups, and community leaders should be prioritized to foster a culture of conservation and ensure the intergenerational transfer of ecological stewardship values.

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