



Assessment of Wild Edible Plants by Some Primates in Toungo Sector of Gashaka Gumti National Park, Nigeria

¹*Maxwell C., ¹Buba U., ²Ya'u M. A., ¹Polycarp F. F., ¹Dauda R. and ³Alaji D. G.

¹Department of Forestry and Wildlife Management, Taraba State University Jalingo, Taraba State, Nigeria.

²Department of Forestry and Environmental Technology, Yobe State College of Agriculture Science and Technology, Gujba, P. M. B. 1104 Damaturu, Nigeria.

³Department of Science Laboratory Technology, Yobe State College of Agriculture Science and Technology, Gujba, P. M. B. 1104 Damaturu, Nigeria.

ARTICLE HISTORY

Received: 03/05/2025

Accepted: 10/07/2025

Article Type:

Research Paper

Volume: 13

Issue: 1

Pp: 194– 201

ABSTRACT

This study investigates wild edible fruits consumed by primates in the Toungo Sector of Gashaka Gumti National Park, aiming to document tree species, assess the parts utilized (leaves, bark, roots), and evaluate the significance of wild edible fruits in primate diets and conservation, as this will help to improve those indigenous tree species for these animals to utilized. Over a five-week period, 12 tree species were identified, indicating the area's rich biodiversity and its capacity to support varied plant and animal life. The number of tree species documented fluctuated weekly, ranging from 2 species in Week 3 to 6 species in Week 4, suggesting potential variations in the availability of fruit resources or patterns of primate foraging behavior. Species such as *Vitex dunania* and *Nauclea latifolia* were prevalent, while *Dovyalis macrocalyx* and *Fragaria vesca* were less common. The primates utilized various tree species such as African Locus Beans (4), Custard Apple (3), Bush Mango (1), and Banana (5). A total of seven (7) primate species were observed, predominantly utilizing fruits (four species) and leaves (three species) for sustenance. Specific preferences were noted, with Patas monkeys favoring *Anona senegalensis* (1) and *Azelia africana* (4), likely due to the nutritional value of these resources. This study highlights the ecological role of wild edible fruits in sustaining primate populations and their importance. The study recommends that community engagement and education programs be established in conserving and protecting primate habitats and the tree species utilized as this will promote conservation and sustainability within the sector and local communities.

Keywords: Wild, Edible, Consumed, Primates, Species, Biodiversity

INTRODUCTION

Wild edible plants (WEPs) are species that are neither cultivated nor domesticated, but are available from the wild and used as sources of food and medicines (Lambert, 2019). Wild' edible plants refers to non-cultivated plants gathered in the field (Hohmann *et al.*, 2012). Scientists have realized the contribution of wild fruits to poverty reduction and their vital role in the

livelihoods of many communities is getting good recognition (Garritty 2014; Ndoeye *et al.* 2014). The wild edible plants with high diversity are widely distributed in mountain forests and they are adapted to the local environment. These enabled them to grow easily with few inputs and be integrated into sustainable farming systems. In Nigeria, the number of indigenous edible plant species is

vast. (Kate, 2018) estimated that 8% of the 7000 higher plants in Nigeria are edible species of which 75% are categorized as Indigenous, semi cultivated or naturalized (Gottfried and Martha, 2012).

Analysis of some wild food plants demonstrates that, in many cases, their nutritional quality is superior and an increasing desire for natural medicine and organically grown foods (Hohmann *et al.*, 2020). Like elsewhere, forests and bushlands are cleared for cultivation. As reported by (Andrew and Volker, 2017) Subsistence technology of Nigerian chimpanzees and Practice of growing dispersed trees in farmlands characterizes a large part of the country's agricultural landscape. However, research and development initiatives in the country largely disregard indigenous fruit species (Poulsen *et al.*, 2019). They are still not valued as are some cultivated food plants, such as mango, orange, cabbage and banana (Garber, 2019). The traditional knowledge for their management and utilization is not exhaustively documented (Carlos, 2017). Tamoaki (2016) reported that studies specifically dedicated to wild fruit trees are few and however, the provision of evidence based information on the existing species in the wild can provide as a step for fruit-based agro forestry development aimed at improving livelihoods and enhancing rural economy (Tamoaki, 2016).

This study is to assess the edible fruits trees eaten by some primates in Toungo sector of Gashaka Gumti National Park with the specific objective of Identify and document the tree species in Toungo Sector. The region is home to a rich diversity of flora and fauna, and understanding which fruits are favored by primates highlights the intricate relationships within the ecosystem. By documenting these preferences, the study can inform conservation strategies to protect both the primate populations and the plant species they rely on, thereby maintaining ecological balance. Primates play a vital role as seed dispersers for many plant species and identifying the fruits they consume can help assess their contribution to forest dynamics and

regeneration processes, which is critical to maintaining healthy ecosystems.

This knowledge can aid in recognizing the importance of primate presence in Toungo sector of Gashaka Gumti National Park environment. Understanding the dietary habits of primates allows for a deeper insight into their nutritional needs and the nutritional value of the fruits they consume (Hawes and Peres, 2014). This information can be beneficial for the formulation of conservation policies that support animal health and population sustainability. In regions where human and wildlife habitats overlap, understanding primate dietary preferences can aid in mitigating conflicts, such as crop raiding and identifying alternative food sources can inform community-based conservation initiatives that promote coexistence between local populations and wildlife and wild edible fruits not only serve as a food source for primates but may also hold cultural significance for local communities and by documenting these fruits, the study can enhance local knowledge and appreciation of biodiversity, as well as provide potential avenues for sustainable harvesting practices that could benefit local economics.

The identification of these fruits is essential not only to understand the ecological roles played by primates but also to inform conservation biology regarding the preservation of both primate populations and their critical habitats. Additionally, understanding the dietary preferences and foraging behavior of these primates will contribute to the broader knowledge of wildlife ecology, enhance community awareness of the importance of specific fruit species, and support local conservation initiatives that can benefit both wildlife and human populations.

The core problem is the incomplete understanding of the types and significance of wild edible fruits consumed by primates in Toungo sector of Gashaka Gumti National Park, which limits effective conservation planning and the sustainable management of this unique ecological region. This work was carried out at Toungo sector of Gashaka-

Gumti National Park from the period of September to October, 2024.

MATERIALS AND METHODS

Study Area

This study was carried out at Toungo sector of Gashaka-Gumti National Park (GGNP) it is located between 6°55'1" - 8°05'1"N and 11°-11'1"-12°13'1" E in North-Eastern Nigeria as shown in Fig. 1. Toungo sector of Gashaka Gumti National Park was established in 1991 and represents Nigeria's largest National Park covering 6600 km² (Dunn, 1999), it was created by Federal Decree (now Act) in 1991 by the merging of Gashaka Game Reserve with Gumti Game Reserve (GGNP, 1998). The mean annual rainfall varies from 1200 mm in the northern part to about 3000 mm in the Southern part of the park (Mubi and Tukur, 2012) while the relative humidity is about 15.7%. The major vegetation type of the park consists of woodland. Some distinctive fauna species found in GGNP include Buffalo (*Syncerus caffer*), Roan antelope (*Hippotragus equinus*), Senegal kob (*Adenota kob*), Lion (*Panthera leo*), Leopard (*Panthera pardus*), Mona monkey (*Cercopithecus mona*), Hunting dog (*Lycaon pitctus*), Giant eland (*Taurotragus debianus*), Oribi (*Ourebia ourebi*), Guinea fowl (*Numida meleagris*) and Monitor lizards (*Varanus niloticus*) among others (Mubi and Tukur, 2012).

Toungo sector of Gashaka Gumti National Park, the largest park in Nigeria, covers 6,731 sq km of wilderness. The park's name is derived from two of the region's oldest and most historic settlements: Gashaka village in Taraba State, and Gumti village in Adamawa State. Toungo sector of Gashaka Gumti National Park was created by Federal Decree in 1991 by the merging of Gashaka Game Reserve with Gumti Game Reserve. The Northern Toungo sector of Gashaka Gumti National Park is relatively flat and covered with woodlands and grasslands, while the Southern, Toungo sector of Gashaka Gumti National Park is more mountainous and contains vast expanses of rainforest as well as areas of woodlands and montane grassland. This rugged terrain is characterized by steep,

thickly forested slopes, deep plunging valleys, precipitous escarpments and swiftly flowing rivers. Altitude ranges from 450 metres above sea level in the wild savannah plains of the Northern sector, to the peaks and pinnacles of Gangirwal in the Southern Park sector, which at a staggering 2,400 metres above sea level, represents Nigeria's highest mountain (Mubi and Tukur, 2012).

The sheer variety of different habitats within Toungo sector of Gashaka Gumti National Park makes the area so uniquely rich in wildlife. The Park is actually an intricate mosaic of montane grasslands, savannah woodlands, swamps, lakes, mighty rivers, dark lowland rainforests, and luxuriant, montane rainforests strewn with ferns and orchids and each habitat supports its own distinctive community of plants and animals (Mubi and Tukur, 2012).

Rainforests provide a haven for animals such as the Giant Forest hog, leopard, Yellow-backed duiker, Golden cat, and many different primate species including chimpanzees. Woodland savannahs are home to buffalo, lion, elephant, and Wild dog, as well as various antelopes such as waterbuck, Roan antelope, kob, hartebeest and the world's largest antelope, the Giant eland. The mountains of the park harbour populations of the rare Adamawa Mountain reedbuck, in addition to Black-and-white colobus monkey, baboon, warthog, oribi, and klipspringer. Whilst its largest unspoilt rivers contain hippos, crocodiles, otters and a wide variety of fishes and the park is officially labelled as one of Africa's "Important Bird Areas" and with more than 500 species found here, this is certainly no exaggeration. Visiting bird watchers constantly add new species to the list. An additional abundance of creatures such as butterflies, flowers and trees, makes this park a naturalists' paradise, unrivalled anywhere for diversity (Mubi and Tukur, 2012).



Fig. 1. Map of Gashaka-Gumti national park

Sources: Tyowua et al. (2017)

Materials

The materials consist of Binoculars, Camera traps, measuring tape and Primate observation sheets and the technical material includes a geographic positioning device (GPS), a digital camera, and a plastic bag for collecting samples of species and wild fruits.

Data Collection

Data were collected from predetermined transects, made up of existing trails in the following seven locations: MA-njaramdi, Boiga, Dalasum, mayo.Sumsum, Mayo.borali, Killa and Gum. Purposive Sampling Method was use to select these sites and data was collected from September - October, using direct observation method. The trails walk in the morning between 06.00 h – 11.00 h and the evening 15.00 h – 18.00 h by the researcher, and 3 staff game guards who was familiar with wildlife species. Activities such as type of primate

look out for plant species fed on, part of plant eaten, and feeding behavior was recorded and a guide book was used where possible.

Data Analysis

Data were analyzed using simple descriptive analysis such as bar chart, tables and percentage.

RESULTS AND DISCUSION

Checklist of Tree species Utilized by Some Primate in Toungo Sector of GGNP

According to Table 1, a total of 12 species of trees were identified over the 5-week period of study. This implies that the study area has a relatively high level of tree species diversity. The number of tree species identified varies from week to week, ranging from 2 species in Week 3 to 6 species in Week 4 and this shows that there may be weekly variations in the availability of fruit

trees or the activity patterns of the primates. Some species, such as *Vitex doniania* (Black Plum) and *Nauclea latifolia* (African Peach), appear to be more common in the study area, with multiple individuals identified over the 5-week period and other species, such as *Dovvalis macrocalyx* (African Goose Berry) and *Fragaria vesca* (African Strawberry), appear to be less common, with only one individual identified over the 5-week and

this finding is in agreement with the finding of Cleophas *et al.*, (2024) who carried out research on macrofungal Diversity in Gashaka Gumti National Park, a total of 37 species of macrofungi distributed across 21 families were encountered. The Gallery Forest recorded the highest number of species (21 species) compared to Savanna woodland (17 species) during the sampling period.

Table 1: Checklist of Tree species Utilized by Some Primate

Week	Species of Tree Identify		Frequency (%)
	Botanical Name	Common Name	
Week 1	<i>Barkia biglobosa</i>	Africa Locus Beans	4 (13.79%)
	<i>Vitex duniania</i>	Black Plum	2 (6.89%)
Week 2	<i>Anona senegalensis</i>	Custard Apple	3 (10.34%)
	<i>Irringia gaboness</i>	Bush Mango	1 (3.44%)
Week 3	<i>Dovvalis macrocalyx</i>	African Groose Berry	1 (3.44%)
	<i>Terminalia supapa</i>	Terminalia SPP	2 (6.89%)
Week 4	<i>Vitex madiensis</i>	Wild Pomegranate	1 (3.44%)
	<i>Musa spp.</i>	Banana	5 (17.24%)
	<i>Nauclea latifolia</i>	Africa Peach	6 (20.68%)
Week 5	<i>Fragariavesca</i>	Africa Straw Berry	1 (3.44%)
	<i>Afzelia africana</i>	African mahogany	3 (10.34%)
	Total		29

Source: Field Survey (2024)

Primates identified and Parts of Trees Utilized in Toungo

About 7 species of animals (primates) were identified in the study area (Table 2 and figure 2). These primates utilized different parts of trees for food and the most common part of the tree utilized was fruit (4 species), followed by leaves (3 species) and Patas monkeys were observed to utilize the fruit of *Anona Senegalensis* (Custard Apple). This suggests that Patas monkeys have a specific preference for this fruit tree. Red Flank monkeys were observed to utilize the leaves of *Afzelia africana* (African Mahogany). This suggests that Red Flank monkeys have a specific preference for this tree species, possibly due to its nutritional value and Baboons were observed to utilize the leaves of *Adansonia*

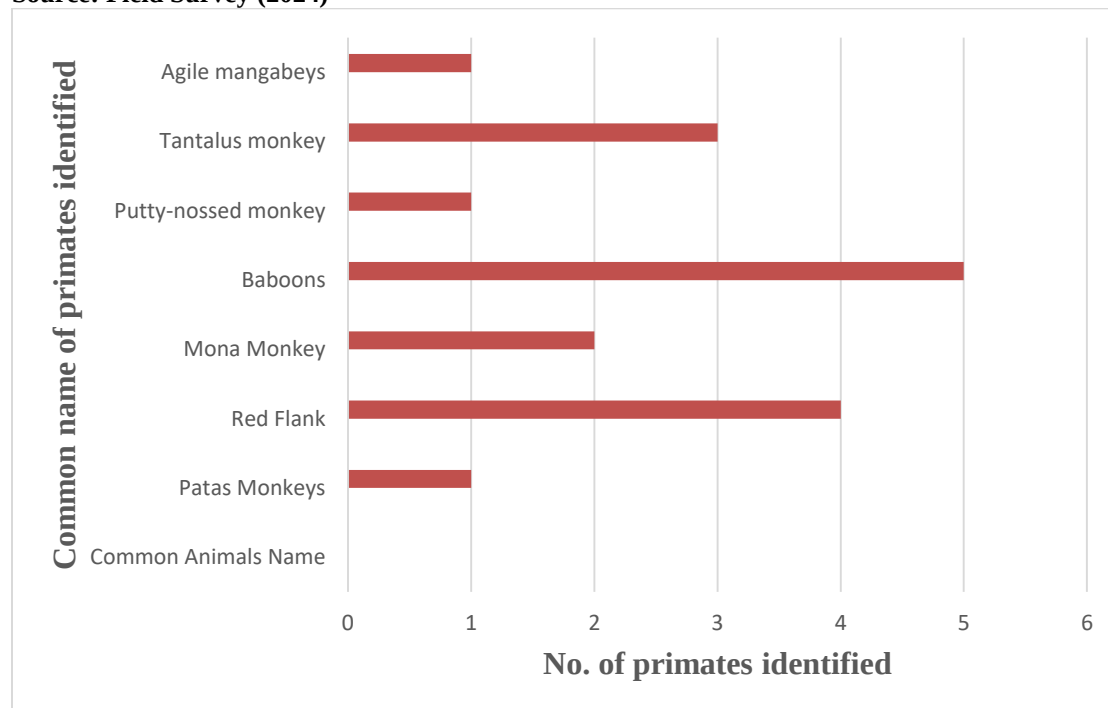
digitata (Baobab) and *Tamarindus indica* (Tamarind). This suggests that Baboons have a diverse diet and are able to exploit multiple tree species for food.

Tantalus monkeys were observed to utilize the fruits of *Vitex doniania* (Black Plum). This suggests that Tantalus monkeys have a specific preference for this fruit tree. Agile Mangabeys were observed to utilize the fruits of African goose berry and this shows that Agile Mangabeys have a specific preference for these fruit tree, which agrees with the findings of Hohmann *et al.*, 2020 which says, analysis of some wild food plants demonstrates that, in many cases their nutritional quality is superior and an increasing desire for natural medicine and organically grown foods.

Table 2: Primates identified and Parts of trees utilized

Name of Primates		No. of primates identified	Part of Tress Utilized
Botanical Name	Common Name		
<i>Erythrocebus patas</i>	Patas Monkeys	1 (5.88%)	Fruit of <i>Anona Senegalensis</i>
<i>Cercocebus torquatus</i>	Red Flank	4 (23.52%)	Leaf of <i>Azelia Africana</i>
<i>Cercopithecus</i>	Mona Monkey	2 (11.76%)	Fruits of <i>ficus SPP</i>
<i>Papiohamadryas</i>	Baboons	5 (29.41%)	Leaf of <i>Adansonia digitata</i> and <i>tamarindus indica</i>
<i>Cercopithecus nictitas</i>	Putty-nossed monkey	1 (5.88%)	Leaf of <i>prunus Africa</i>
<i>Chlorocebus tantalus</i>	Tantulus monkey	3 (17.64%)	Fruits of <i>vitex duniana</i>
<i>Cercocebus agilis</i>	Agile mangabeys	1 (5.88%)	Fruit of <i>dovyallis abyssinica</i>
Total number of primates Identified		17	

Source: Field Survey (2024)


Figure 2: Some Primates Identified in Toungo Sector of GGNP

CONCLUSION

The study concludes that Toungo Sector of GGNP is a complex and dynamic environment that supports a diverse range of plant and animal species. The findings of the study highlight the importance of conserving and protecting this ecosystem, not only for the primates that inhabit it but also for the many other species that depend on it. The study also emphasizes the need for further research into the ecological relationships between primates and their habitats, in order

to better understand the complex interactions that occur within these ecosystems.

RECOMMENDATIONS

Based on the findings of the study, the following recommendations are made:

- Conservation of Tree Species: The study highlights the importance of conserving and protecting the tree species that are utilized by primates. Efforts should be made to protect and preserve these tree species, in order to

- maintain the ecological integrity of the forest ecosystem.
- ii. Protection of Primate Habitats: The study emphasizes the need to protect and conserve the habitats of primates, in order to ensure their survival and well-being. Efforts should be made to establish protected areas, such as national parks and wildlife reserves, in order to safeguard these habitats.
 - iii. Research and Monitoring: The study recommends that further research and monitoring be conducted into the ecological relationships between primates and their habitats. This will help to better understand the complex interactions that occur within these ecosystems and inform conservation efforts.
 - iv. Community Engagement and Education: The study recommends that community engagement and education programs be established, in order to raise awareness about the importance of conserving and protecting primate habitats and the tree species that they utilize. This will help to promote a culture of conservation and sustainability within local communities.

REFERENCES

- Abraham, D. D. (2016). Collection and identification of wild fruits tree/shrub species in Amhara Region, Ethiopia, *Ethiopian Journal of Biological Sciences*, 15(1): 45-65.
- Adi, A. I., Rahman, A. M. and Mulyadi, D. (2019). Diversity of wild edible fruit plants and traditional knowledge in the West Aceh region, Indonesia, *Journal of Ethnobiology and Ethnomedicine*, 15(1), 1-10.
- Andrew and Volker (2017) *Behavioral ecology of savanna chimpanzees (Pan troglodytes verus) with respect to insectivory at Fongoli, Senegal*. Graduate Theses and Dissertations. Pp 11.
- Carlos, A. P. (2017). Notes on the ecology of buffy saki monkey (*Pithecia albicans*, Gray 1860): A canopy seed-predator, *American Journal of Primatology*, 31:129-140.
- Cleophas, A. B., Ali, A. D., Elisha, E. B., Joel, B., Barau, B. W., & Yohanna, C. T. (2024). Macrofungal Diversity in Gashaka Gumti National Park. *Bima Journal of Science and Technology*, 8(2B), 149-157.
- Garber, P. A. (2019). The ecology of seed dispersal in two species of callitrichid primates (*Saguinus mystax* and *Saguinus fuscicollis*), *American Journal of Primatology*, 10:155-170.
- Garrity, D. P. (2014). Agroforestry and the achievement of the millennium development goals. *AgroforSyst.* 62(1-3): 5-17.
- Gashaka Gumti National Park (GGNP) (1998). A Management Plan for Developing the Park and its Support Zone. Prepared by the Nigerian Conservation foundation and World Wide Fund for Nature with Support for Department for International Development for the Federal ministry of Agriculture and Natural Resources.
- Gottfried, V. and Martha A (2012). Feeding ecology in apes and other primates. Max-Planck Institute for Evolutionaire, Anthropologies, Germany. Available at <https://assets.cambridge.org/97805218/58373/frontmatter/9780521858373>

- [frontmatter.pdf](#). Accessed on June 24, 2024.
- Hawes, J. E. and Peres, C. A. (2014). Ecological correlates of trophic status and frugivory in neotropical primates. *Oikos*, 123(3), 365-377.
- Hohmann, G. and Engelhardt, A. (2012). Primates-Human Conflicts. In: Hohmann, G., and Fruth, B. (Eds.). *Primates in Perspective*, Oxford University Press.
- Hohmann, G., Potts, K. and N'guessan, A. (2020). Plant foods consumed by Pan: Exploring the variation of nutritional ecology across Africa. *American Journal of Physical Anthropology*, 141:476–485.
- Kate, A. (2018) Behavioural ecology data and its relevance for management. *Conservation research in the African rainforests, a technical handbook*.
- kwaga B. T., Yager G. O. and Samuel D. E. (2017) Feeding Ecology of Primates in Southern Sector of Gashaka-Gumti National Park (Filinga Range), Taraba State, Nigeria, *Asian Journal of Environment and Ecology* 2(3): 1-9.
- Kwaga, J. (2020). List and Composition of Wildlife Harvest by Some Selected Communities Surrounding Toungo Sector of Gashaka Gumti National Park, Adamawa State, Nigeria.
- Lambert, J. E. (2019) Primate digestion: Interactions among anatomy, physiology, and feeding ecology. *Evolutionary Anthropology issues, News and Reviews*, 7(1):8-20.
- Mubi, A. M. and Tukur, A. L. (2012) Species Density and Diversity along Geomorphic. grad in Gashaka-Gumti National Park, Nigeria. *Ethiopian Journal of Environmental Studies and Management (EJESM)*, 5(4):513 – 518.
- Ndoye, O., Awono, A. and Schreckenber, S. (2014) Commercializing indigenous fruit for poverty alleviation. Policy briefing for governments in the African humid tropics. ODI, London.
- Poulsen, J. R., Clark, C. J. and Smith, T. B. (2019). Seasonal variation in the feeding ecology of the grey-checked mangabeys (*Lophocebus albigena*) in Cameroon. *American Journal of Primatology*, 54:91-105.
- Tamoaki N. (2016) Feeding ecology of western lowland gorillas in the Nouabale-Ndoki National Park, Congo, *Primates*, 36(2):151-168.
- Tyowua, B. T., Yager, G. O. and Samuel, D. E. (2017). Feeding Ecology of Primates in Southern Sector of Gashaka-Gumti National Park (Filinga Range), Taraba State, Nigeria. *Asian Journal of Environment & Ecology*, 2(3): 1-9.