



## Foraging Behaviours of Non-Human Primates Frugivores in Marguba Range of Old Oyo National Park, Nigeria

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**ABSTRACT:** This study assessed foraging behaviour of non-human primates frugivorous in Marguba range of Old Oyo National Park, Nigeria. Three (3) tracks were selected in Marguba range of the Park. A distance of 2km on each track was covered. At both sides of each track, a plot of 100m by 100m was laid with an interval of 0.7km apart, giving a total of 6 (100x100) sample plots on each side of the tracks. The finding revealed that two (2) frugivores non-human primates species were encountered (*Papioanubis* and *Erythrocebus patas*). The population of fruit bearing plant in Ipade Aya spot showed that *Nuclear latifolia* and *Diospyrosmes piliformis* recorded the highest observation with 22.8% and 21.7% respectively, followed by *Gardenia sokoensis* with 14.1% while *Ficussy comorus* recorded the least with 2.2%. The population of fruit bearing plant in Idi-ose track revealed that *Detarium macrocarpum* recorded the highest observation with 20.0%, followed by *Piliostigma thonniigii* and *Nauclear latifolia* with 14.5% and 12.7% respectively while *Adansonia digitata* recorded the least with 5.4%. The population of fruit bearing plants in Ajaku spot, *Nauclear latifolia* recorded the highest with 23.1%, followed by *Annonas enegalensis* and *Detarium macrocarpum* with 15.4% each while the least plant are *Piliostigma thonniigii* and *Anogeisus leiocarpus* with 12.8% each. The foraging behavior of non-human primates includes shaking the tree, plugging fruit and seed directly from the plat and feeding on the ground.

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Frugivores are animals that feed on fruit and they could be any type of herbivores or omnivores (Howe, 2019). Frugivores eat large volume of fruit and are highly dependent on the abundance and nutritional compositions of fruits (Willson and Traveset 2000). These fruits commonly have edible appendages (e.g. seed arils) or tissues surrounding the seeds (i.e. fruit pulp) that reward some nutrient benefit in exchange for the potential service of moving the seeds away from the source (Herrera 2002). The survival and reproduction of most angiosperm plants highly depend on the ecological dispersal service provided by frugivorous animals (Herrera, 2009). Around 90% of tropical tree species produce fleshy fruits dispersed by

vertebrate animals, such as primates and birds (Jordano, 2012). Fruits are a primary food sources for many animal species, at least temporarily (Willson and Traveset 2000). The 'dispersal syndrome' hypothesis argues that evolutionary convergence of fruit traits (e.g. colour, size, aromas, nutrients) in different plant species is driven by a set of similar frugivorous species (Voigt *et al.*, 2004; Lomascolo and Schaefer, 2010). Therefore, the diversification of fruit traits might be the outcome of different selective pressures from frugivores with different visual/olfactory perceptions (Valido *et al.*, 2011). Animals select food items based on a complex set of criteria, including temporal and spatial food availability, perceptive abilities to locate

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food, morphological constraints, food quality, the animals' own nutritious requirements, and avoidance of toxins (Jordano 2000; Stiles 2000). Non-human primates are an important taxonomic group among tropical arboreal fauna, and one of the most dominant in terms of overall biomass (Tashiro, 2001). Collectively, primates use a diverse array of resources, for example, fruits, seeds, flowers, leaves, invertebrates, and fungi Corlett, (2009), indicating that they play a pivotal role in the complicated network of interactions among animal and plant species in the ecosystems. Ogunjemite, (2017), reported that Nigeria is one of fifteen countries in the world with highest species of non-human primates, they are highly successful mammals occupying a wide variety of habitats. Due to their inherent ability to adapt to various, often harsh environments they occur widespread throughout Africa and are present in areas ranging from semi desert to gallery forest. Being omnivorous they are capable of finding food in even the poorest of environments (Dunbar and Barrett, 2000). They have the ability to survive across a diverse range of ecological conditions. They appear to cope well in most habitats, having filled various niches in what often appears to be extreme surroundings (Isbell *et al.*, 1998). Non-human primates are one of the most threatened taxa globally (Schipperet *et al.*, 2013; Schwitzeret *et al.*, 2015) and their survivorship depends on our understanding of the drivers affecting their

persistence at different scales in fragmented areas. Landscape changes produce a reduction in the amount of habitat available to species and the increases in fragmentation (Fahrig 2003). These influence the population dynamics, extinction risk and other responses of species, through their influence on ecological processes and function (Pardini *et al.*, 2010; Haddad *et al.*, 2015). Hence, the objectives of this paper was to evaluate the foraging behaviours of non-human primates' frugivores in Marguba range of Old Oyo National Park, Nigeria.

## MATERIAL AND METHODS

**Study Location:** Old Oyo National Park lies between latitude 8°15' and 9°00'N and longitude 3° 35' and 4° 42' E. Old Oyo National Park is one of the Oldest conservation area in Nigeria and indeed the West African sub region having been designated upper Ogun Forest Reserve in 1936, converted to Oyo-Ile Forest Reserve in 1941 and designated Game Reserve in 1952. The sources potentials and the rich cultural and biological diversities informed the Federal Government, decision to elevate the reserve to the status of a National Park by decree No 36 of 1991 It has a total land area of about 2,512km<sup>2</sup> and average rainfall of 1,100mm/year. The vast guinea savannah ecotype with luxuriant grass, browse plants species and water supports grazing of ungulates.

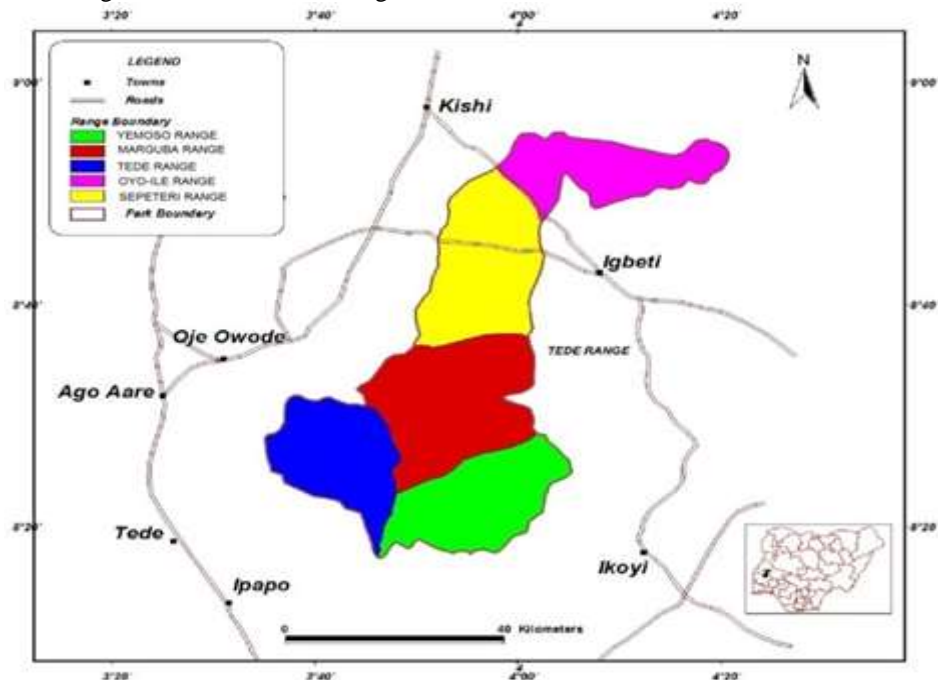


Fig 1: Map showing Old Oyo National Park Source: Ogunjimiet *et al.*, (2016)

**Data Collection:** Data for this study was obtained through the use of sample plots. Three (3) tracks were selected in Marguba range of the Park. A distance of 2

km on each track was covered. At both sides of each track, a plot of 100 m by 100 m was laid with an interval of 0.7 km apart, giving a total of 6 (100x100)

sample plots on each side of the tracks. On each plot, the fruit bearing plants and frugivores sighted was identified and enumerated.

**Materials:** Measuring tape, pegs, ranging poles, cutlass, Field guide book, camera, field report book and pen

**Data Analysis:** Data gathered from this study was analyzed using descriptive statistics for the objectives and the results were presented in frequency and tables.

**RESULTS AND DISCUSSION**

Table 1 reveal the frugivores non-human primates species available in the study area in which *Papioanubis* and *Erythrocebuspatas* was present. The population of fruit bearing plant in Ipade Aya spot are showed in table 2, *Nuclear latifolia* and *Diospyros mespiliformis* recorded the highest observation with 22.8% and 21.7% respectively, followed by *Gardenia sokoensis* with 14.1% while *Ficussy comorus*

recorded the least with 2.2%. Table 3 revealed the population of fruit bearing plant in Idi-ose track, in which *Detarium macrocarpum* recorded the highest observation with 20.0%, followed by *Piliostigma thonnigii* and *Nauclear latifolia* with 14.5% and 12.7% respectively while *Adansoni adigitata* recorded the least with 5.4%. Table 4 indicated the population of fruit bearing plants in Ajaku spot, *Nauclear latifolia* recorded the highest with 23.1%, followed by *Annonasen egalensis* and *Detarium macrcarpium* with 15.4% each while the least plant are *Piliostigma thonnigii* and *Anogeisus leiocarpus* with 12.8% each. The foraging behavior of non-human primates in all the tracks are revealed in table 5,6 and 7. The behavior includes shaking the tree, plugging fruit and seed directly from the plat and feeding on the ground.

**Table 1:** Species of Frugivores Non-Human Primates

Species	Scientific Name
Olive Baboon	<i>Papioanubis</i>
Red Patas monkey	<i>Erythrocebuspatas</i>

Source: Field Survey, 2023

**Table 2:** Population of fruit bearing plant in Ipade Aya Spot

S/N	Fruit bearing Plant	Plot A	Plot B	Total	%
1	<i>Nauclealatifolia</i>	6	15	21	22.8
2	<i>Azeliaafricana</i>	4	2	6	6.5
3	<i>Annonasenegalensis</i>	3	0	3	3.3
4	<i>Anogeissusleiocarpus</i>	4	1	5	5.4
5	<i>Detariummacrocarpum</i>	5	5	10	10.8
6	<i>Diospyrosmespiliformis</i>	7	13	20	21.7
7	<i>Ficussycomorus</i>	2	0	2	2.2
8	<i>Gardenia aquallia</i>	4	2	6	6.5
9	<i>Gardenia sokoensis</i>	4	9	13	14.1
10	<i>Piliostigmathonnigii</i>	6	0	6	6.5
<b>Total</b>		45	55	92	100.0

Source (field survey, 2023)

**Table 3:** Population of fruit bearing plant in Idi-Ose Track

S/N	Fruit bearing Plant	Plot A	Plot B	Total	%
1	<i>Adansoniadigitata</i>	3	-	3	5.4
2	<i>Prosopisafricana</i>	4	1	5	9.1
3	<i>Pterocarputerinaceus</i>	4	2	6	10.9
4	<i>Brideliaferruginea</i>	4	1	5	9.1
5	<i>Vitexdoniana</i>	4	2	6	10.9
6	<i>Strychnosspinosa</i>	1	3	4	7.2
7	<i>Nauclealatifolia</i>	5	2	7	12.7
8	<i>Detariummacrocarpum</i>	4	7	11	20.0
9	<i>Piliostigmathonnigii</i>	5	3	8	14.5
<b>Total</b>		33	22	55	100.0

Source: Field Survey, 2023

**Table 4:** Population of fruit bearing plant in Ajaku Spot

S/N	Fruit bearing Plant	Plot A	Plot B	Total	%
1	<i>Piliostigmathonnigii</i>	1	4	5	12.8
2	<i>Nauclealatifolia</i>	4	5	9	23.1
3	<i>Diospyrosmespiliformes</i>	3	1	4	10.3
4	<i>Annonasenegalensis</i>	4	2	6	15.4
5	<i>Anogeisusleiocarpus</i>	3	2	5	12.8
6	<i>Ficussycomorus</i>	2	2	4	10.3
7	<i>Detariummacrocarpum</i>	4	2	6	15.3
<b>Total</b>		<b>21</b>	<b>18</b>	<b>39</b>	<b>100.0</b>

Source: Field Survey, 2023

**Table 5:** Foraging Behavior of Non-human Primates Frugivores in Ipade Aya Jeep Spot

S/N	Fruit bearing Plant	Primates that feed on them	Feeding habit	Stage of maturity (ripe and unripe)	Part consumed fruit and seed
1	<i>Nauclealatifolia</i>	<i>Erythrocebuspatas</i>	Plug directly	Ripe	Fruit
2	<i>Detariummacrocarpum</i>	<i>Erythrocebuspatas</i> <i>Papioanubis</i>	Plug directly shaking of tree	Ripe Both	Fruit Fruit
3	<i>Diospyrosmespiliformis</i>	<i>Erythrocebuspatas</i>	Plug directly	Both	Fruit
4	<i>Ficussycomorus</i>	<i>Papioanubis</i>	Shaking of tree	Both	Fruit
5	<i>Gardenia aquallia</i>	<i>Papioanubis</i>	Plug directly	Ripe	Fruit
6	<i>Piliostigmathonnigii</i>	<i>Erythrocebuspatas</i> <i>Papioanubis</i>	Shaking of tree Plug Directly and feed on the ground as well	Both Ripe	Fruit Fruit

Source (field survey, 2023)

**Table 6:** Foraging Behavior of Non-human Primates Frugivores in Idi-Ose Track

S/N	Fruit bearing Plant	Primates that feed on them	Feeding habit	Stage of maturity (ripe and unripe)	Part consumed fruit and seed
1	<i>Pterocarpuserinaceus</i>	<i>Erythrocebuspatas</i>	Plug directly	Ripe	Fruit
2	<i>Brideliaferruginea</i>	<i>Erythrocebuspatas</i>	Plug directly	Ripe	Fruit
3	<i>Vitexdoniana</i>	<i>Erythrocebuspatas</i> <i>Papioanubis</i>	Plug directly Plug directly	Both Ripe	Fruit Fruit
4	<i>Strychnosspinosa</i>	<i>Papioanubis</i>	Shaking of tree	Ripe	Fruit
5	<i>Nauclealatifolia</i>	<i>Erythrocebuspatas</i>	Plug directly	Ripe	Fruit
6	<i>Detariummacrocarpum</i>	<i>Erythrocebuspatas</i> <i>Papioanubis</i>	Plug directly shaking of tree	Ripe Both	Fruit Fruit
7	<i>Piliostigmathonnigii</i>	<i>Erythrocebuspatas</i> <i>Papioanubis</i>	Shaking of tree Plug Directly and feed on the ground as well	Both Ripe	Fruit Fruit

Source: Field Survey, 2023

**Table 7:** Foraging Behavior of Non-human Primates Frugivores in Ajaku Spot

S/N	Fruit bearing Plant	Primates that feed on them	Feeding habit	Stage of maturity (ripe and unripe)	Part consumed fruit and seed
1	<i>Diospyrosmespiliformes</i>	<i>Erythrocebuspatas</i>	Plug directly	Both	Fruit
2	<i>Annonasenegalensis</i>	<i>Erythrocebuspatas</i>	Plug directly	Both	Fruit
3	<i>Ficussycomorus</i>	<i>Papioanubis</i> <i>Erythrocebuspatas</i>	Plug directly	Ripe	Fruit

Source: Field Survey, 2023

These findings indicated that two (2) non-human primates are found in the study area (Table1), this primate have been previously reported by Ajibade *et al.*, (2011) and Meduna, (1988). A total of 16 plants species was enumerated. These results is less than 222 plant species belonging to 11 families previously reported by Akande *et al.*, (2018) reported in the Kainji Lake National Park. Non-human primates and trees have been evolved to be involved in a very complex set of interaction (Tutin *et al.*, 1996; Chapman and Chapman 1996). It is apparent that trees offer a lot of services to primates such as food and cover (Cowlshaw and Dunbar 2000). In the efforts of extracting these services from the plant community, primates also contribute to the evolution and existence of plants in services like pollination of flowers (Carthew and Goldingay 1997), dispersal of seeds (Chapman and Chapman 1996) and germination of seeds (Lieberman *et al.* 1999) which tends to play a crucial role in regeneration of tropical forests

(Wrangham *et al.* 1996; Chapman and Onderdonk 1998). The forage utilization showed that fruit is the most utilized part of the plant they fed on this tracks indicated above. This results support the finding Chism *et al.* (2013) that reported that non-human primates climb trees where they sleep at night and feed on fruits. Although Chapman and Onderdonk (1998) reported that primates do majority of their feeding on the ground with up to 85% of feeding activity occurring terrestrially.

The principal food substances taken by the primates maybe divided into vegetable such as fruits, flowers, leaves, nuts, bark, pith, seed, grasses, stems, roots, berries and tubers and animal including birds, bird eggs, lizard, insects, frogs and crustacean (Ivan Crab, 2010). According to Ivan Crab (2010), primates exploit a variety of food sources. It has been said that many characteristics of modern primates including humans, derive from an early ancestor's practices of

taking most of its food from the tropical canopy, the primates includes fruits in its diet to obtain easily digested carbohydrates and lipids for energy. However, they require other foods such as leaves, insects, for amino acids, vitamins and minerals (Ivan Crab, 2010).

*Conclusion:* The study on the foraging behavior of non-human primates frugivores in Old Oyo National Park shows that there are lots of fruit bearing plant and two (2) non-human primates are encountered feeding on them. It also shows the feeding habit, stage of maturity of fruit when consumed, pattern of feeding and parts consumed. The study recommends that all activities that reduce the population of both flora and fauna resources such as illegal felling of tree, illegal hunting pressure, over grazing by livestock etc. should be discourage.

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