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## **POPULATION DISTRIBUTION AND DIVERSITY OF *Pycnanthus angolensis* IN RAINFOREST SOUTHWEST, NIGERIA**

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### **ABSTRACT**

Population distribution of *Pycnanthus angolensis* was carried out in two locations of three States (Osun, Ekiti and Oyo) due to abundance and availability using direct enumeration. A total of 58 stands of plant viz Osun state 58.93%, Ekiti State 28.57% and Oyo State 12.50% were assessed. Variation occurred within each State (Osun State: Ila 32.35% > 20.59% Olooyo and Mojapa, Gbongan 17.65%, Ile Ogbo 5.88% and least in Ajaba (2.94%). In Ekiti State, Osan 43.75% > Otun 31.25%. > 25% Ayetoro Ekiti. In Oyo State, Adewumi, 28.57% > 14.29% > Idito, Erumu, Sapara (U.I), Mosque (U.I) and Amina (U.I), 39 juvenile and 19 mature trees (flowering and fruiting) varied in ratios 30:6 Osun State, 9:7 Ekiti State and 0:6 Oyo state respectively. Osun State had the highest number of juvenile trees (30), 9 in Ekiti State and zero juvenile in Oyo state. Ekiti State had the highest number of mature tree 7 > Oyo and Osun (6). Osun State had greater number of juvenile trees than Ekiti and Oyo States. *P. angolensis* was found growing in fallow or abandoned land, marshy areas, farmland, river side, new site areas and Quarters. *P. angolensis* could be found on different habitats among the States and within the States. Given the high rate of forest destruction in the country, there is need to ensure sustainable conservation of the forest area to avoid further destruction by provision of alternative means of livelihood for the local population so as to reduce their dependence on these forest.

**Keywords:** Population density, Diversity, Rainforest, *Pycnanthus angolensis*, Nigeria

### **INTRODUCTION**

A forest is a natural resource of multiple values, oftentimes, estimated from the stand point of population density or standing volume of timber tree species present, while ignoring the more valuable non-timber species (Udo *et al.*, 2009). The Nigerian forest is predominantly a rainforest occupying only 9.7% (95 372 km<sup>2</sup>) of the country's land area of 983 213 km<sup>2</sup> (Onyekwelu *et al.*, 2005). The tropical rainforest is the most biologically diverse terrestrial ecosystem on

earth (Jacob, 2012). It is also a complex community whose framework is provided by trees of many sizes, form and species. Trees are often the most conspicuous plant life form in a tropical rain forest. Upon the framework of these trees and within the microclimate of the canopy of the trees, grow a wide range of other kinds of plants such as epiphytes, strangling plants, climbers, and saprophytes. Unfortunately, only a fragment of the country's tropical rainforest (21% of the rainforest ecosystem and 2% of the

country's land mass) has been constituted into forest reserves (Udo *et al.*, 2009).

Nigeria has one of the highest rates of deforestation (3.3 percent/year) in the world (Sodhi *et al.*, 2004). Between 1990 and 2000, the country has lost some 6.1 million hectares or 35.7 percent of its original forest covers. Currently, since 2000 Nigeria has been losing an average of 11 percent of its primary forests per year that doubles the rate of the 1990s (Mongabay.org). These figures give Nigeria the dubious distinction of having the highest deforestation rate of natural forest on the planet, consequently our pristine ecosystems have been significantly altered (Turner, 2001) with severe consequences on biodiversity, soil and climate (Udofia *et al.*, 2011) The need to conserve the remaining areas of tropical rainforest cannot be over emphasized given the high rate of forest destruction, degradation and fragmentation threatening the survival of both fauna and flora species in the country. As efforts are geared towards preventing the utter destruction of our ecosystem and ensuring the conservation of its rich biodiversity, adequate quantitative and qualitative ecological data of the flora and fauna species is imperative.

Such data is needed for effective and realistic conservation strategies. The required ecological data include species composition, and abundance of species. This study was therefore carried out to assess the diversity and population of *Pycnanthus angolensis* in the study area. The data obtained may serve as a basis for formulating strategies for sustainable management of the forest and other similar forest tracts in the country.

## MATERIALS AND METHODS

### *Procedures for Data Collection*

Three States were selected randomly from the rain forest areas of the South West, Nigeria. Oyo, Ekiti and Osun States were purposively selected due to the availability and abundance of the plant.

### **DATA COLLECTION AND ANALYSIS**

Data were collected through direct enumeration of all trees within each selected State. The total number of stands per location per State, percentage frequency (%), habitat (lowland, upland, fallow land, farm, and river side), number of stand with flowering and fruiting within each selected State were investigated. Data collected were analysed using descriptive statistics such as pie chart and results were presented in tables and chart.

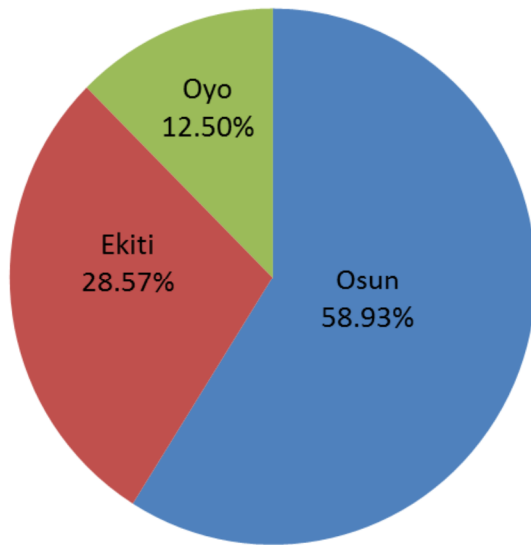
## RESULTS

The population distribution of *P. angolensis* across three selected states was presented in Table 1. A Total of fifty-eight (58) stands of *P. angolensis* were distributed across the selected states. The table revealed that highest population was found in Osun state, followed by Ekiti state, with 58.93, 28.57% respectively. The least population distribution was found in Oyo state with 12.50%. This indicated that Osun State had the highest population of *P. angolensis*. Population varied within each state in Osun state, the highest population 32.35% in Ila followed by 20.59% in Olooyo and Mojapa, 17.65% in Gbongan, 5.88% in Ile Ogbo while the least tree was found in Ajaba (2.94%) (Figure 2).

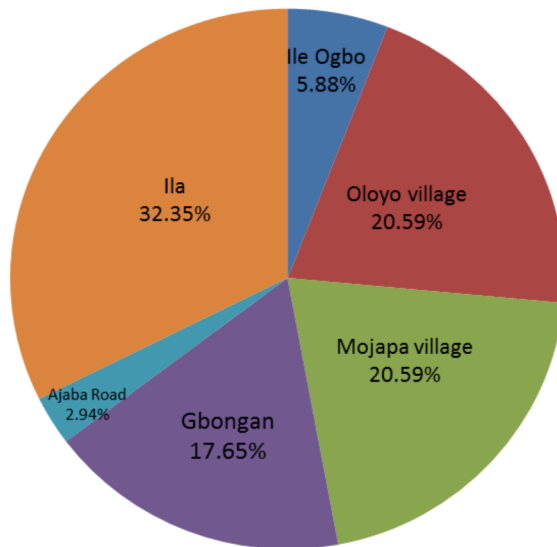
In Ekiti state, Osan had the highest population 43.75% followed by Otun 31.25%. The least population distribution 25% was found in Ayetoro Ekiti (Figure 4.3). In Oyo state, the highest population 28.57% in Adewumi, while the least tree (14.29 %) was found in Idito, Erumu, Sapara (U.I), Mosque (U.I) and Amina (U.I) (Figure1).

**Table 1: Population Distribution of *P. angolensis* across Selected States**

Location	Number of Stand/ Percenentage (%)	Total/ Percentage (%)	Maturity/ Trees Status	Flower- ing	Fruiting	Habitat
<b>OSUN STATE</b>						
Ile ogbo	2 (5.88)	34 (58.93)	Juvenile			Abandoned
Oloyo village	7 (20.59)		Juvenile			Fallow/ abandoned
Mojapa village	7 (20.59)		Juvenile			Fallow/ abandoned
Gbongan	6 (17.65)		2 Mature 4 Juvenile			Fallow land, Farm land, fallow land.
Ajaba Road	1 (2.94)		Mature			Marshy area/ farmland
Ila	11( 32.35)		1 Mature 10 Juvenile			Farmland/ Riverside
<b>EKITI STATE</b>						
Osan	7(43.75)	16 (28.57)	4 Mature 3 Juvenile			River side/ fallow land
Otun	5 (31.25)		2 Mature 3 Juvenile			River side/ abandoned land/ fallow land
Ayetoro	4 (25)		1 Mature 3 Juvenile			New site area/ fallow/ river side
<b>OYO STATE</b>						
Erumu	1(14.29)		Mature			Marshy Area
Idito	1(14.29)		Mature			Farm land / New site area
Adewumi	2 (28.57)	7 (12.50)	Mature			New site area
Sapara road	1 (14.29)		Mature			Farm land
Amina	1 (14.29)		Mature			Quarters



**Figure 1: Morphological variation in the natural population of *P. angolensis***



**Figure 2: Distribution of *P. angolensis* in Osun study area**

The tree status varied across the states from juvenile to maturity. A total of thirty-nine (39) trees of *P. angolensis* existed as juvenile and nineteen (19) as mature trees (flowering and fruiting). However, tree status varied in ratios 30:6 in Osun state, 9:7 in Ekiti state

and 0:6 in Oyo state respectively. The highest 30 juvenile trees were found in Osun state, the least juvenile 9 in Ekiti state and no juvenile was found in Oyo state. The highest mature tree (7) was found in Ekiti state while the lowest mature tree (6) was recorded from

Oyo and Osun states respectively. This indicated that Osun State had more juvenile trees than Ekiti and Oyo States and seven (7) mature trees in Ekiti state.

*P. angolensis* was found growing in fallow or abandoned land, marshy areas, farmland, river side, new site areas and Quarters. In

Osun State, it was found growing on abandoned or fallow land and farmland. It was found growing in river side and new site areas in Ekiti State while it was found growing on farm land, new site, river side and quarters. This indicated that *P. angolensis* could be found on different habitats among the States and within the States.

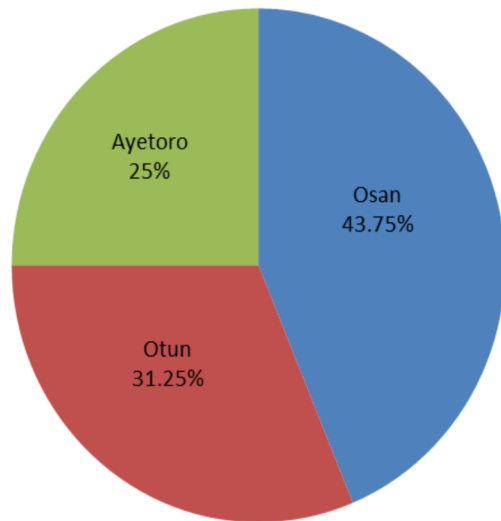


Figure 3: Distribution of *P. angolensis* in Ekiti study area

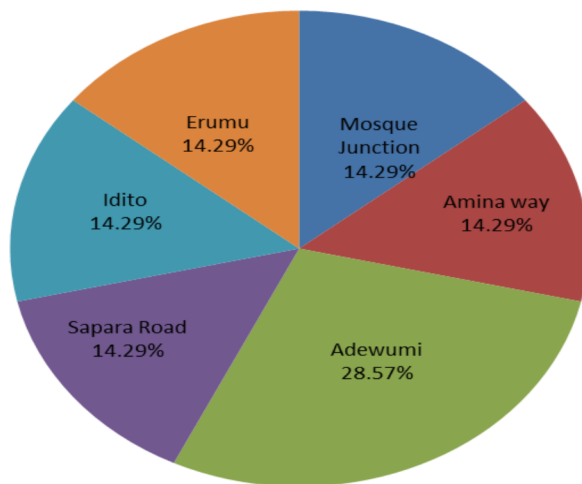


Figure 4: Distribution of *P. angolensis* in Oyo study area

## CONCLUSION

The study concluded that this species has been exploited so heavily in the past that it is now sparsely found in some locations of the study area but deeply populated in Osun State with juvenile trees. Secondly, due to loss of its habitat by deforestation and encroachment of land for cultivation, its population is on the decline towards extinction. Therefore, the current study recommends the conservation of the remaining populations of targeted plant through active participation of local communities. Furthermore, afforestation and re-afforestation programs should be timely carried out in the area to restore the degraded ecosystem.

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