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## Tree Species Diversity and Soil Status of two Natural Forest Ecosystems in Lowland Humid Tropical Rainforest Region of Nigeria

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### Abstract

The species rich tropical rainforests have been and are still under intense pressure to satisfy local and international demands for timber and non-timber products, the long-term effect being degradation in terms of quality and quantity of the forest ecosystem. Tree species diversity and soil properties were investigated for a primary (Queen's) and two degraded (Elephant and Oluwa) tropical rainforest ecosystems in Nigeria. Queen's forest has not been logged within living memory while Oluwa and Elephant forests were last logged in early 1970s and 1990s, respectively. Differences in soil physical and chemical properties of the three sites could not be attributed to the effect of forest degradation since there was no discernable pattern in soil properties of primary and degraded forests. The differences appeared to be site specific. A total of 31 different families were encountered in all three sites (26, 24 and 22 in Queen's, Oluwa and Elephant forests, respectively). Queen's forest had the highest number of tree species (51), followed by Oluwa (45) and lastly by Elephant forest (31). About one third of all tree species identified in Queen's, Oluwa and Elephant forests were among the endangered tree species in Nigeria, a situation that calls urgent conservation measures. Species diversity index, species richness and species evenness followed the order: Queen's forest > Oluwa > Elephant forest, indicating that species diversity, species richness and species evenness in the three sites depended on the state of the forest, with diversity decreasing as the level of forest degradation increases. The similarity of species diversity of the once highly degraded Oluwa forest to that of Queen's forest shows that lowland tropical rainforests have the ability of returning to their original “species rich” situation even after significant degradation, provided the forest is left undisturbed for a considerable period of time.

**Keywords:** Degraded forest, primary forest, regeneration, species diversity, species evenness, tropical rainforest ecosystem