

## **Assessment of differentiation of vegetation composition and structure of dry and moist intermediate zones in Imenti forest, Mt. Kenya ecosystem**

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### **abstract:**

Forests in East Africa occur in lowland and upland areas with some recognized as worlds' biodiversity hotspots. The moist and dry intermediate forest types occur on the eastern side of Mt. Kenya forest. Mt. Kenya forest ecosystems represent nearly 20% of the natural forests remaining in Kenya and consist of Ngare Ndare and Imenti forests. The World Agroforestry Centre has produced an improved and revised version of vegetation map for Mt. Kenya forest ecosystem. The revised map was mainly based on the earlier version by Trapnell and colleagues. However, the accuracy of revised map had not been tested. The aim of the study was to determine vegetation floristics and physiognomy of dry and moist intermediate vegetation types. Four field surveys were made from October 2009 to January 2010. The mapped vegetation boundary of the moist and dry forests was marked using Map source software and then loaded into Garmin map60CSX GPS. Quadrats of 40 x 40 m were established at intervals of 500 m in the five sampling sites identified in each vegetation type. Species composition was documented by recording all individual trees with DBH  $\geq$  5cm and height  $\geq$  5 m in the quadrats. A 10x 10m sub-quadrat was randomly selected from the 40 x 40 m quadrat to record saplings with height in between 1m and  $<$ 5 m. A 4 x 100 m belt transect was used to record species composition in each forest for the development of profile diagrams. Ordination analysis was used to compare similarity in species composition. One-way ANOVA was used to test for difference in the mean values among the sites. Two sample t and z tests were used to compare mean differences of the tree densities, DBH and heights. Shannon-Wiener diversity index was used to compare species diversity of the two forests. Vegetation structure of the forests was compared by use of histograms computed from various DBH (stem) and height size classes. A total of 104 species were recorded in both forests. Similarity in species composition for moist and dry forests was found to be low as it was clearly separated. Shannon- Wiener diversity index and tree density were not significantly different ( $p > 0.05$ ) between the moist and dry forests. A sub-set of 20 characteristic species was recorded based on Trapnell checklist. Species abundance patterns of the two forests assumed an inverse J-shaped distribution as majority of the species occurred in smaller DBH class sizes. The important value indices showed that *Cordia africana* and *Olea europaea* were dominant species in moist and dry forest respectively. The accuracy of the revised vegetation map for Imenti section of Mt. Kenya ecosystem was found to be correct. A study on the lower plants is important for future monitoring of the forests while re-forestation efforts should be enhanced to restore the forests. Surveillance needs to be improved to curb illegal logging and charcoal burning