DIVERSITY AND ENDEMICITY OF CHILIMO FOREST, CENTRAL ETHIOPIA

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ABSTRACT

Studies on the regeneration, structural and uses of some woody species in Chilimo Forest, one of the dry Afromontane Forests of Ethiopia were conducted. To gather vegetation and environmental data from the study forest, a 900 m^2 (30 m x 30 m) quadrat was laid following the homogeneity of vegetation. All together the plant species recorded from Chilimo Forest are 213 which can be categorised into 83 families. Of these, the highest proportion is the angiosperm (represented by 193 species) followed by pteridophyta (16 species); the least represented being the gymnosperms (represented by 2 exotic and 2 indigenous species). To provide a better management and monitoring as well as to maintain the biodiversity, cultural and economic values of the forest unsustainable utility of the forest would be controlled with the various conservation activities in place.

Key words: Chilimo Forest, Diversity, endemism

INTRODUTCION

Chilimo Forest is one of the Dry Afromontae Forests of Ethiopia. Tsegaye Tadesse (expert served in the forest for 20 years, personal com.) stated that the Chilimo Forest was controlled by the close allies of Minilik after his invasion of the area. One of the close allies of Minilik, a French citizen (Komdor) who provided him with war weapons, was the first to get the forest as a favour. After the departure of Komdor, the forest was passed to Ras Mekonnen who in turn passed it to Hailesillassie. It is believed that Hailesillassie built the building in the forest and upon the birth of Leul Mekonnen he transferred the forest to his wife, Itege Menen. Before the Italian invasion, Itege Menen contracted the forest with five foreign investors and the forest began to produce large scale timbers. After the Italian invasion (i.e., between 1937-1968) the forest had been owned by different foreign investors who used sawmills for the production of numerous timber products. These foreign investors include Jana (between 1937-1941), Kazantay (1942-1945), Mozvold (1946-1951), Fogstan (1952-1953) and Vaskin (1954-1968) (Tsegaye Tadesse, personal comm.). After 1968, all the sawmills were forced to stop operation and protection of this forest came into existence. Albeit the declaration of protecting the forest, not enough had been done to circumvent 60% loss of this forest in ten years time. It is not uncommon to mention that Ethiopia had experienced substantial deforestation, soil degradation and an increase in the area of bare land over the years (Logan, 1946). The need for fuel wood, arable land and grazing areas are the main causes of forest degradation, frequently leading to loss of forest cover and biodiversity, erosion, desertification and reduced water resources.

MATERILAS AND METHODS

THE STUDY AREA

The Chilimo Forest (collectively known as Chilimo Gaji Forest) is situated 97 km west of Addis Ababa, 7 km north of the small town of Ginchi and close to the main road running to Ambo. Altitudinally, the forest area ranges between 2170 to 3054 m a.s.l. The forest is a small enclave in the western section of the ridge that stretches from the capital westward to Gedo highlands and covers some ca. 2500 ha though the area allocated as forest is more. The inhabitants of the area are the Oromos with some other ethnic groups settled in the heart of the forest, who came to the area to work as a daily labourers at the time of the operation of the sawmill. According to Tamrat (1994) and Friis (1992), the Chilimo Gaji Forest belongs to Dry Afromontane forest type.

In Ginchi and the surrounding Chilimo area, there are five rainy months extending from May-Sept with the highest peak in July. Ginchi belongs to Type I rainfall regime of Daniel (1977) class.

Vegetation and Environmental Data

Data on vegetation and environmental parameters were gathered using a 900 m^2 (30 m x 30 m) quadrat which was laid following the homogeneity of vegetation (Mueller-Dombois and Ellenberg, 1974). Sample plots were selected through preferential means in such a way that the various conditions encountered represented in the study forest. Woody species were counted. Additional tree and shrub species within 10-m distance from the plot boundaries were recorded as present. Plant specimens were identified at the National Herbarium and in the field. All voucher specimens that were in flowering and/or fruiting stages were brought to the National Herbarium of Addis Ababa University and deposited. Nomenclature of plant taxa follows the published volumes of Flora of Ethiopia and Eritrea.

RESULTS AND DISCUSSION

Diversity of Chilimo Forest

Analysis of the gathered data indicated that there exists a diverse plant species occurring in the forest investigated for the present study. The gathered plant species include pteridophyta, gymnosperms and angiosperms. All together the plant species recorded from Chilimo Forest are 213 and can be categorised into 83 families. As shown in Figure 1, the highest proportion is the angiosperm (represented by 193 species) followed by pteridophyta (16 species); the least represented being the gymnosperms (represented by 2 exotic and 2 indigenous species).

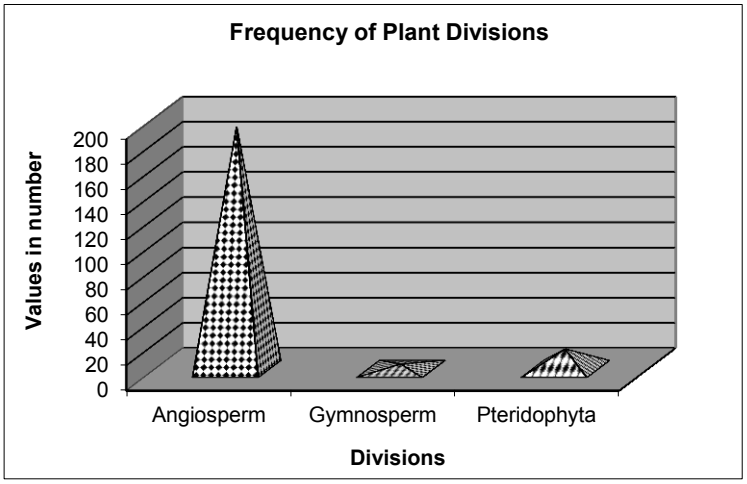

Fig. 1 Proportions of angiosperm, gymnosperms and pteridophytes in Chilimo Forest.

Complete lists of the species recorded from Chilimo Forest with their family and local names can be obtained from authors.

Floristics

The Chilimo Forest is one of the Afromontane Forests in the country. Despite its proximity to the center, this forest has been studied repeatedly, inter alia, Tamrat Bekele (1994) made a significant contribution. Floristically, Juniper and Podo are the emergent species in the forest. Other important species include *Scolopia theifolia, Olea europaea, Maytenus gracilipes, Myrsine africana, Allophylus abyssinicus, Erica arborea, Bersama abyssinica, Olinia rochetiana, Nuxia congesta, Prunus africana, Sideroxylon oxyacanthum, Osyris quadripartita, Plantago palmata, Satureja paradoxa, S. nilotica, Carissa edulis, Hypoestes forsskaolii* and *Geranium arabicum.*

Endemism

There are a number of flowering plant species in Chilimo forest that are endemic. Information on the endemic flowering plant species of Ethiopia and the levels of threat to them has been published in Ensermu *et al.,* (1992), and Vivero *et al.,* (in press). Based on the published Flora volumes and the lists of species in this forest, the endemic species and the levels of threat on each taxon are given in Table 1 below.

Table 1: Endemic species occurring in Chilimo Forest.

No.	Scientific name	Status	Family
1	*Acanthus sennii*	NT	Acanthaceae
2	*Clutia abyssinica*	VU	Euphorbiaceae
3	*Conyza nana*	EN	Asteraceae
4	*Crotalaria rosenii*	NT	Fabaceae
5	*Impatiens rothii*	LC	Balsaminaceae
6	*Kalanchoe petitiana*	LC	Crassulaceae
7	*Lippia adoensis*	LC	Verbanaceae
8	*Maytenus addat*	NT	Celastraceae
9	*Mikaniopsis clematoides*	LC	Asteraceae
10	*Phragmenthera macrosolen*	LC	Loranthaceae
11	*Polystachya rivae*	VC	Orchidaceae
12	*Rhus glutinosa subsp. glutinosa*	VU	Anacardiaceae
13	*Rhus glutinosa subsp. neoglutinosa*	LC	Anacardiaceae
14	*Satureja paradoxa*	NT	Lamiaceae
15	*Solanecio gigas*	LC	Asteraceae
16	*Thymus schimperi*	LC	Lamiaceae
17	*Vernonia leopoldi*	LC	Asteraceae
18	*Vernonia rueppellii*	LC	Asteraceae

Table 1 show that 18 endemic species have been recorded from Chilimo Forest. Based on the IUCN Criteria of level of threat, 1 species is endangered (EN) and 3 species have been evaluated as vulnerable (VU), 4 other species have been categorised as not threatened (NT). The remaining ten species have been found to be categorized as species of least concern (LC).

Conclusion and Recommendations

Chilimo Forest is one of the remaining Afromontane forests harbouring many endemic species. This forest is ecologically, socially, economically and culturally very important for the inhabitants residing near by who are mostly dependent on forest product to make their living. Loss of such a forest and the various threatened species would have great implications for the environment, biodiversity and socio-economic setup of the communities. This forest harbours species that endemic, economically and ecologically important. Such species requires urgent conservation measures that will enhance healthy regeneration and guarantee sustainable uses of these species. Although *Juniperus procera* and *Podocarpus falcatus* are both common in Chilimo Forest, the former has been more affected than the later being extracted for timber. However, the condition seems improving, at least in forest patches situated away from the urban centre. It has been observed that the second most important timber tree species, *Podocarpus falcatus* is regenerating at an alarming rate, while *Juniperus procera* also shows encouraging recovery. In general the following points could be taken into consideration.

- Enhance diversification of livelihood (poultry, improved varieties of crops),
- Introduction of modern beehives,
- Introduce ecotourism,
- Enrichment plantation of the forest patches by indigenous species such as *Hagenia abyssinica, Juniperus procera, Olea europaea and O. capensis,*
- Assist in the propagation and the distribution of seedlings of plants whose uses are already wide spread in the area and which are threatened, e.g. *Juniperus procera, Podocarpus falcatus, Hagenia abyssinica, Prunus africana* etc.

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