

**BOTANICAL SURVEY IN THE MIOMBO WOODLANDS:
A CASE OF URUMWA AND IGOMBE FOREST RESERVES, TABORA**

L. Mbwambo and G. Mbwiga

*Tabora Miombo Woodland Research Centre
P.O. Box 1960, Tabora*

Abstract

A botanical survey was carried out in Urumwa and Igombe Forest Reserves between August 1998 and December 1999 as part of training for local collectors. A total of 68 plant specimens were collected and identified at species level. These species belonged to 32 different families. Two of the collected species, *Pseudolachnostylis maprouneulifolia* (Euphorbiaceae)

and *Diplorhynchus mosambisensis* (Apocynaceae) are endemic to the miombo woodlands of southern Africa. Recommendation is made for an intensive botanical survey.

Introduction

Miombo is a term used to describe indigenous woodlands of central, southern and eastern Africa

which are largely characterised by three closely related genera of *Brachystegia*, *Julbernardia* and *Isobertinia*, from the legume family Caesalpinioideae (Jeffers and Boaler, 1966; Lawton, 1982; White, 1983). In Tanzania, miombo is the most important type of savanna woodland (Gauslaa, 1988). Muyombo in Kinyamwezi and Kisukuma languages in Tanzania refer to *Brachystegia spiciformis*. According to White (1983) 19 species of *Brachystegia* and three species of *Julbernardia globiflora*, *J. paniculata* and *Isobertinia angolensis* occur in miombo as dominants. In addition to the dominant tree species, some canopy associates such as *Pterocarpus angolensis* and *Azelia quanzensis* are valuable timber species (Jeffers and Boaler, 1966; Lawton, 1982; Acres *et al.*, 1984). The diversity of canopy species is low, although the overall species richness of the flora is high (Frost, 1996). The miombo woodlands form part of the Zambezian regional centre of endemism, which has about 8,500 species of, which about 4,600 are endemic. In Tanzania miombo occurs at altitudes from near sea level to about 1,600 m, with annual rainfall ranging from 500 to 1,200 mm (Jeffers and Boaler, 1966). It constitutes the largest single vegetation type in the country, forming nearly 80 per cent of the total forest area or 13 per cent of the land area (MNRT, 1998). The relatively dry miombo woodland covers extensive areas of Shinyanga, Kigoma, Tabora, Rukwa, Mbeya and Iringa Regions and wet miombo occupies the south-eastern regions (Millington *et al.*, 1994). Vertically miombo in Tanzania consists of two main layers, the tree canopy and the herb or ground layer, plus an underwood layer of smaller trees. In some places a shrub layer also exists (Jeffers and Boaler, 1966; Acres *et al.*, 1984). Little attention has been given on botanical survey research in the miombo woodlands of Tabora. Most studies in Tabora miombo have focused on ecology and management and devoted limited attention to species distribution and composition. Inadequate information that exist on the miombo species diversity in Tabora, has prompted a botanical survey. The plant collections made will form part of herbarium specimens.

Materials and methods

Study sites

This survey was carried out between August 1998 to December 1999 in Urumwa Forest Reserve (5° - 5.2°S and 32.7° - 33°E) and Igombe Forest Reserve (4° - 5°S and 32.7° - 33°E) respectively, about 15 and 30 km from Tabora Municipality.

Methods

In each forest reserve seven transects, two meters wide and two kilometers long were laid out and plants along the transect were identified. Voucher specimens were collected for herbarium confirmation. Most of the identification work was done at the Arusha based Tropical Pesticides Research Institute (TPRI) herbarium and others were identified during field work using their local names. Only new species were added to the list as the length of the transect approached the reserve centre. When an open grassland was encountered along the transect, a 5m x 5m plot was laid down and all new plant species were collected. Specimens were prepared using a sharp knife where both small parts of branches, flowers, fruits and bark were collected. The specimens were pressed using newsprint and dried.

Results and Discussion

A total of 68 plants were collected and identified to the species level and belonged to 32 different families (Tables 1 & 2).

Amongst the collected species, *Pseudolachnostylis maprouneulifolia* (Euphorbiaceae) and *Diplorhynchus mosambisensis* (Apocynaceae) are endemic to the miombo woodlands (White, 1983). Given the problems of encroachment and deforestation in the miombo woodlands of Southern Africa, it is most likely that if no immediate measures are taken to conserve the remnants of Tanzania miombo, endemic species or restricted niches are potentially threatened. It is evident from these results that the family Caesalpinioideae which characterise the miombo woodlands forms a small proportion of recorded families. These woodlands are now dominated by Combretaceae, Mimosaceae, Papilionaceae, Euphorbiaceae and Rubiaceae families, an indication of selective removal of species, and habitat degradation.

Table 1. The number of species per each family collected in Urumwa and Igombe Forest Reserves

Family	No. of species	Family	No. of species
Anonaceae		Sterculiaceae	1
Apocynaceae		Tiliaceae	
Boraginaceae		Bignonaceae	
Campanulaceae		Caesalpinioideae	2
Capparaceae		Gramineae	
Celastraceae		Liliaceae	
Cluciaceae		Malvaceae	
Convolvulaceae		Vitaceae	
Flacourtiaceae		Cyperaceae	3
Lamiaceae		Scrophulariaceae	
Loganiaceae		Verbenaceae	
Myrtaceae		Combretaceae	4
Opiliaceae		Mimosaceae	5
Pedaliaceae		Papilionaceae	
Polygalaceae		Euphorbiaceae	6
Sapindaceae		Rubiaceae	9

Table 2. Plant species recorded in Urumwa and Igombe Forest Reserves

Family	Species	Family	Species
Anonaceae	<i>Annona senegalensis</i>		<i>Albizia amara</i>
Apocynaceae	<i>Diplorhynchus mosambicensis</i>		<i>Albizia brachycalyx</i>
Bignonaceae	<i>Markamia obtusifolia</i>	Mimosaceae	<i>Dichrostachys cinerea</i>
	<i>Steriospermum kunthianum</i>		<i>Entada abyssinica</i>
Boraginaceae	<i>Heliotropium subulatum</i>		<i>Mimosa pigra</i>
Caesalpinioideae	<i>Brachystegia spiciformis</i>	Myrtaceae	<i>Syzygium guinense</i>
	<i>Piliostigma thonningii</i>	Opiliaceae	<i>Opilia alidifolia</i>
Campanulaceae	<i>Lightfootia marginate</i>		<i>Dalbergia melanoxylon</i>
Capparaceae	<i>Maerua angolensis</i>		<i>Indigofera brevicalyx</i>
Celastraceae	<i>Hippocratea parvilfora</i>	Papilionaceae	<i>Indigofera podocarpa</i>
Cluciaceae	<i>Psorospermum febrifugam</i>		<i>Stylosanthes fruticosa</i>
	<i>Combretum collium</i>		<i>Tephrosia notiflora</i>
Combretaceae	<i>Combretum fragrans</i>	Pedaliaceae	<i>Sesamum angustifolium</i>
	<i>Combretum molle</i>	Polygalaceae	<i>Securidaca longipedunculata</i>
	<i>Terminalia serecea</i>		<i>Oxygonum atriplicipolium</i>
Convolvulaceae	<i>Astripomoea malvaceae</i>		<i>Agathisanthemum bojeri</i>
	<i>Cyperus amabilis</i>		<i>Catunaregan spinosa</i>
Cyperaceae	<i>Kyllinga richardii</i>		<i>Crossopterix febrifuga</i>
	<i>Mariscus dubius</i>	Rubiaceae	<i>Gardenia ternifolia</i>
	<i>Acalypha ornata</i>		<i>Rothmania engleriana</i>
	<i>Acalypha senensis</i>		<i>Tapyphyllum obtusifolium</i>
	<i>Antidesma vernosum</i>		<i>Tricalysia ovalifolia</i>

Table 2. (Continued) Plant species recorded in Urumwa and Igombe Forest Reserves

Family	Species	Family	Species
Euphorbiaceae	<i>Hymenocardia mollis</i>		<i>Vangueria acutiloba</i>
	<i>Margaritaria discoidea</i>	Sapindaceae	<i>Zanha africana</i>
	<i>Pseudolachnostylis maprouneulifolia</i>		<i>Cycnium adonanse</i>
	<i>Flacourtia indica</i>		Scrophulariaceae
Gramineae	<i>Eragrostis champelieri</i>		<i>Ramphicarpa tubulosa</i>
	<i>Fimbristylis exilis</i>	Sterculiaceae	<i>Weltheria indica</i>
Lamiaceae	<i>Hyptis suaveolens</i>	Tiliaceae	<i>Grewia bicolor</i>
	<i>Asparagus africanum</i>		<i>Clerodendrum uncinatum</i>
Liliaceae	<i>Gloriosa simplex</i>	Verbenaceae	<i>Lantana rhodensiense</i>
	<i>Strychnos cocculoides</i>		<i>Vitex mombasae</i>
Loganiaceae	<i>Hibiscus allenii</i>		<i>Cissus producta</i>
Malvaceae	<i>Sida acuta</i>	Vitaceae	<i>Cyphostema kerkmoden</i>

Conclusions and recommendations

Miombo woodlands are important ecosystems in the region forming habitats for both plants, wildlife, fisheries and other living organisms. This survey has shown that there is a number of plant families in the miombo woodlands of Tabora which require further studies to determine species composition and diversity. It is recommended that a more intensive botanical survey is carried out in the Tabora miombo woodlands in that focus.

References

- Acres, B.D., Barret, A.T., Corker, I.R., Davies, K., Manfield, J.E., Myers, C.N., Rackham, L.J. and Walton, R.K. 1984. Tabora Rural Integrated Development Project. Land use component. In: P. Mitchell, A.J.B. (ed.). *Land Evaluation and Land Use Planning in Tabora Region*. Final Report. Land Resources Development Centre, Surbiton Survey, Kent. p. 47-206.
- Frost, P. 1996. The ecology of the miombo woodlands. In Campbell B. (ed.) *The Miombo in Transition: woodlands and welfare in Africa*. Centre for International Forestry Research, Bogor, Indonesia. p. 11-55.
- Gauslaa, Y. 1988. Management and regeneration of tropical woodlands with special reference to Tanzania conditions. *Lidia* 2: 37-112.
- Jeffers, J.N.R. and Boaler, S.B. 1966. Ecology of a miombo site. Lupa North Forest Reserve. Tanzania. I. Weather and plant growth. 1962 - 1964. *Journal of Ecology* 54: 447-463.
- Lawton, R.M. 1982. Natural resources of miombo woodland and recent changes in agricultural and land use practices. *Forest Ecology and Management* 4: 285-297.
- Millington, A.C., Critchley, R.W., Douglas, T.D. and Ryan, P. 1994. *Estimating Woody Biomass in Sub-Saharan Africa*. The World Bank, Washington D.C.
- Ministry of Natural Resources and Tourism (MNRT), 1998. *The National Forest Policy*. Government Printer, Dar es Salaam, Tanzania. p. 1-8.
- White, F. 1983. *The vegetation of Africa*. A descriptive memoir to accompany the UNESCO/AETFAT/UNSO vegetation map of Africa. UNESCO.