NOTES ON SECONDARY MONTANE FORESTS IN EASTERN TANZANIA

Jon C. Lovett

Moist forests on east facing slopes of the ancient crystalline mountains in eastern Tanzania (the Eastern Arc mountains of Lovett, 1986 1990) are remarkable for the high degree of species and generic endemism that they contain (Polhill 1968). However certain high altitude forests on these mountains are relatively poor in tree species, and those species which do occur are widespread in the Afromontane region (of White, 1983). Two examples are parts of forests at Mufindi in the southern Udzungwa mountains (08° 35' S 35° 15' E; altitude 1,800 m; rainfall 1,600 mm/year) and those at Ukwiva in the Rubeho mountains (07° 20' S 36° 35' E; altitude 1,600 - 1,700 m; rainfall not recorded but probably around 1,600 mm/year). A preliminary list of tree species observed at the two localities is given in Table 1.

In other Mufindi forests, notably those of the Kigogo Forest Reserve (08° 40' S 35° 15' E) and Luisenga stream (08° 36' S 35° 18' E) there are a number of plant species of restricted distribution, for example; *Aframomum laxiflorum, Afrothismia insignis, Allanblackia stuhlmannii, Bersama rosea, Oxyanthus lepidus* subsp. *kigogoensis, Psychotria megalopus, Stolzia christopheri,* and *Stolzia leedalii* are found in the Kigogo and; *Eugenia* sp. nov., *Hickelia* sp. aff. *madagascariensis*, and *Trichocladus goetzei* are found on the Luisenga stream. Similarly Mangalisa forest (07° 10' S 36° 25' E) in the Rubeho mountains near Ukwiva contains interesting species such as *Tinnea vesiculosa* and *Zimmermannia stipularis* (Lovett & Congdon, 1989). These forests are more typical of the endemic rich Eastern Arc type.

Greenway (1973) observed that forests at Mufindi and nearby Dabaga (08° 05' S 35° 56' E) showed "... almost everywhere, past cultivation in the form of crop ridges and furrows when the forest floor herbage is removed". At Ukwiva numerous pot shards and spoil pits for house building were observed in the forest on a recent visit (Lovett & Minja, 1990). Other forest areas on the Livingstone mountains near Uwemba (09° 28' S 34° 46' E) have a similar species composition and structure to those at Mufindi and so may also cover evidence of previous cultivation and habitation. Upland plateau areas of the Eastern Arc mountains are very suitable for a settled agricultural population as they have a reasonably reliable rainfall and at 1,600 - 2,000 m in altitude are well above the main malarial zone. Outside the forests, soils tend to be highly leached and so rather poor, whereas forest soil is rich in organic matter

and fertile. Consequently the forest land is prefered for agriculture, a practise which is continued to the present day by clearance of upland forest for tea plantation.

The people living adjacent to Ukwiva forest say that they are of the Wahehe tribe who fled from Iringa town following the German attack on, and break-up of, the Hehe kingdom from 1894 to 1896. Apparently Ukwiva was forest at that time, and they attributed the pot shards to occupancy by the Wakwiva whom they say had long since left. Immediately to the north of Ukwiva, forest on the Ukaguru mountains (06° 25' S 36° 50' E) reserved by the German administration in the early part of this century, is also secondary (Parry, 1962). Iliffe (1979) reports that a visitor to the coast in 1776 was told that small pox existed throughout the south of present day Tanzania, and it is possible that an epidemic of this nature resulted in the loss of population and subsequent forest regrowth.

With the exception of *Bridelia brideliifolia* which is cut at Mufindi for furniture grade timber under the local name *Muhape*, none of the species listed in Table 1 are of economic importance. Species of commercial interest that should occur in these forests, and which do occur in some parts of Mufindi and at Mangalisa, are *Ocotea usambarensis* and *Podocarpus latifolius*. Thus in over 100 years of natural regeneration following cultivation the forests contain little of economic or conservation interest despite the presence of suitable seed sources nearby. Old pit-saw sites also show a lack of diversity in comparison to the immediately surrounding forests. At Shume-Magamba (04° 40' S 38° 15' E; altitude 1,900 m) in the West Usambara mountains a pit-saw site resulting from the cutting of *Ocotea usambarensis* estimated to be 40-50 years old only contained pole regeneration of the pioneer *Macaranga kilimandscharica*. In the Nguru South forest (06° 00' S 37° 30' E; altitude 1,200 m) a similarly aged pit-saw site resulting from cutting for *Khaya anthotheca* (formerly *Khaya nyasica*) contained only pole regeneration of the pioneer *Cylicomorpha parviflora* (Lovett & Thomas, 1988). In the Kigogo Forest Reserve pit saw sites resulting from cutting for *Khaya anthotheca* in the 1950s and early 1960s contain only *Neoboutonia macrocalyx* regeneration 10-15 m tall and a sward of 3 m tall *Mimulopsis*. All sites are located in the midst of species rich forest. Thus small gaps created by pit sawing only contain pioneer species of no commercial value after 30 to 50 years natural regeneration.

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REFERENCES

Greenway, P.J. (1973). A classification of the vegetation of East Africa. Kirkia 9: 1-68.

Iliffe, J. (1979). A modern history of Tanganyika. African Studies Series 25. Cambridge University Press, Cambridge.

Lovett, J.C. (1986). The Eastern Arc forests of Tanzania. Kew Magazine, 3: 83-87.

Lovett, J.C. (1988). Endemism and affinities of the Tanzanian montane forest flora. Monogr. Syst. Bot. Missouri Bot. Gard. 25: 591-598.

Lovett, J.C. (1990). Classification and status of the moist forests of Tanzania. Mitt. Inst. Allg. Bot. Hamburg 23a: 287-300.

Lovett J.C. & Congdon, T.C.E. (1989). Some notes on a visit to Mangalisa mountains, Tanzania. East Africa Natural History Society Bulletin 19: 25-26.

Lovett, J.C. & Thomas, D.W. (1988). Report on a visit to Kanga mountain, Tanzania. East Africa Natural History Society Bulletin 18: 19-22.

Lovett, J.C. & Minja T.R.A.. (1990). Notes on a visit to Ukwiva forest, Tanzania. East African Natural History Society Bulletin 20: 3-4.

Parry, M.S. (1962). Progress in the protection of stream-source areas in Tanzania. East African Agricultural and Forestry Journal (Special Issue) 27: 104-106.

Polhill, R.M. (1968). Tanzania. Acta Phytogeographica Suecica 54: 166-178.

White, F. 1983. The vegetation of Africa. UNESCO, Paris.

TABLE 1. Tree species observed in secondary Mufindi and Ukwiva forests.

Species	Mufindi	Ukwiva
Arecaceae		
Phoenix reclinata	•	
Araliaceae		
Cussonia spicata	•	•
Polyscias fulva	•	•
Celastraceae		
Catha edulis	•	•
Maytenus acuminata	•	•
Chrysobalanceae		
Parinari excelsa	•	•
Ebenaceae		
Diospyros whyteana	•	•
Ericaceae		
Agauria salicifolia	•	•
Euphorbiaceae		
Bridelia brideliifolia	•	
Bridelia micrantha	•	•
Neoboutonia macrocalyx	•	
Macaranga kilimandscharica	•	•
Flacourtiaceae		
Aphloia theiformis	•	•
Loganiaceae		
Nuxia congesta	•	•
Monimiaceae		
Xymalos monospora	•	•
Moraceae		
Ficus sp.	•	
Myrsinaceae		
Maesa lanceolata	•	•
Rapanea melanophloeos	•	•
Rhizophoraceae		

Cassipourea gummiflua	•		
Scrophulariaceae			
Halleria lucida	•		•

Jon Lovett worked in Tanzania for many years with the World Wide Fund for Nature and Missouri Botanical Garden, and taught botany at the University of Dar es Salaam. Currently he is a visiting scientist at the Botanisk Museum, Copenhagen.