

A reconnaissance survey of the woody flora and vegetation of the Catapú logging concession, Cheringoma District, Mozambique

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ABSTRACT

A checklist of the trees, shrubs and lianes of Catapú, Cheringoma District, Mozambique, is presented. Floristically the study area falls within the Swahilian/Maputaland Regional Transition Zone. In total, 238 woody species and infraspecific taxa have been recorded, representing 59 families and 167 genera. Most species (64%) occur both to the north and south of the study area, 26% have their core distribution in the Swahilian Regional Centre of Endemism, 4% have a more southerly distribution, 14 are endemic to the Swahilian/Maputaland Regional Transition Zone and two near-endemic, extending into the Zambezi Regional Centre of Endemism only along the Zambezi River Valley as far west as Kariba. The checklist includes the Sena names for 191 species, 77 of which are recorded for the first time. Comparisons of the Catapú checklist are made with other checklists.

INTRODUCTION

According to a preliminary checklist of vascular plants, the flora of Mozambique comprises 3 932 indigenous plant taxa and of these 177 are endemic (Da Silva *et al.* 2004). The primary purpose of the study was to establish what trees, shrubs and woody lianes occur on the Catapú logging concession area. Floristically, White (1983) recognized the zone occupying the East African coastal belt, \pm 50–200 km wide, from southern Somalia in the north to the mouth of the Limpopo River in the south as the Zanzibar-Inhambane Regional Mosaic. Subsequently this phytochorion was split into two smaller floristic regions by Clarke (1998), namely: 1, the Swahilian Regional Centre of Endemism along the Kenyan, Tanzanian and northern Mozambique coasts and marginally extending into southern Somalia; and 2, the Swahilian/Maputaland Regional Transition Zone extending along the Mozambique coast and into southern Malawi and eastern Zimbabwe between the Swahilian Regional Centre of Endemism and White's (1983) Maputaland-Pondoland Regional Mosaic. The study area falls within the Swahilian/Maputaland Regional Transition Zone.

Wild & Barbosa (1967) broadly classified the vegetation of the concession area as Dry Deciduous Lowland Forest (vegetation type 6), Mosaic of Low Altitude Dry (Mixed) Forest and Miombo (vegetation type 10) and Discontinuous Dry Savanna Woodland-Tree Savanna and 'Tandos' Grassland (Gorongosa Lowland) (vegetation type 45) along the lower altitude river valleys. The Wild & Barbosa (1967) map also indicates the presence of Open Deciduous Tree Savanna (Lowland) with *Acacia nigrescens* dominant (vegetation type 52) but this has not been seen either in or near the study area. White (1983)

mapped the region as North Zambezi Undifferentiated Woodland and Wooded Grassland (mapping unit 29c), which seem to better describe the floristically rich vegetation of the study area. In the east, Catapú borders White's Zanzibar-Inhambane East African Coastal Mosaic (mapping unit 16a). Outliers of one of the forest types, Zanzibar-Inhambane Undifferentiated Forest, occur on Catapú.

Although some plant exploration was undertaken in the Sofala Province of Mozambique between 1940 and 1980, notably by Müller & Pope (1973 pers. comm.) and Tinley (1977), that part of Mozambique was still remote, and collecting of herbarium material was largely confined to areas adjacent to roads. In those days, Catapú was well away from the main road which went between Inhambitanga and Marromeu. During the civil war in Mozambique (1975–1994), botanical collecting came to a halt and has only taken place sporadically since then (Da Silva *et al.* 2004). Hitherto, most of the botanical inventories undertaken in Mozambique have been conducted mainly in the south of the country; the central and northern parts have been less well documented (Izidine & Bandeira 2002). The paucity of biodiversity data for central and northern Mozambique has also been highlighted by Schipper & Burgess (2004).

The checklist focuses on the woody plants and lianes and is ongoing. To describe the intricate mosaic of vegetation types in the study area, we have adopted a narrative style which we hope will be useful for workers on the ground and as a basis for possible quantitative surveys in future. The common Sena (= Cisena, Chisena) names—the principal vernacular of the region—are presented, many for the first time. We also comment on the impacts of logging on the vegetation and the need for measures to ensure sustainability and the conservation of an ecosystem rich in plant diversity.

STUDY AREA

Catapú, the logging concession of TCT-Dalmann Furniture, Lda., is located 30–40 km south of the Zambezi River and on the northwestern side of the Inhambitanga Village in the district of Cheringoma, Sofala

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Province, central Mozambique (Figure 1) at $\pm 18^{\circ}00'05''$ and $E35^{\circ}08'13''$, an area covering 24 821 ha. The GPS reading at the sawmill is $S18^{\circ}02'41''$; $E35^{\circ}12'24''$. The main road, the EN-1, traverses the concession where it \pm follows the watershed between the Zangue and Tissadze Rivers. Field work started in 2000 and results up to July 2006 are reported. Hitherto the survey has been concentrated within the firebreak around the sawmill area, west of the EN-1 along the roads known as Via Pungue and Via Santove and around the pans.

In the west, Catapú is bordered by the Zangue River and flood plain, up which the Zambezi River floods back during the wet season. The eastern boundary extends from the EN-1 road/railway junction at Gangala in the north along the obsolete Dondo-Caia railway line to the Inhamitanga Village. The northern boundary is in the form of a 'V' with Via Zangue 2 on the western arm and the EN-1 on the eastern arm. The southern boundary is the Inhamitanga road to the EN-1 at Chapa and then the EN-1 to the Zangue River bridge. The Tissadze River flows from south to north \pm bisecting the eastern half of the concession and the Chirimadzi River, which is more a series of pans than a river with the woody vegetation margin more clearly defined than the waterway, goes from south to north in the northern third.

The altitude at the Catapú turn-off from the EN-1 is 200 m a.s.l. but drops from ± 100 to 50 m along the river valleys. Soils are sand with outbreaks of sandstone and

calcareous conglomerates and black cotton or turf soils around the vleis and in the river floodplains. The sands are underlain by sublittoral sands which accumulate water, enabling them to support very tall trees. A bore-hole was drilled and a sample collected every 3 m to a depth of 51 m. Every sample was sand except for the first 3 m in which there was some gravel. Mean annual rainfall ranges from 700–1 400 mm, although for the last four years it has barely exceeded 500 mm during the rainy season (November to March). There are many pans in the forest/thicket/woodland mosaic, grass-covered depressions of half a hectare or more which fill with water during the rains. As a result of below-average rainfall, none of these pans has held any water for the last four or five years. During the other seven months (April to October) an average of 126 mm has been recorded.

Vegetation of Catapú comprises a mosaic of mainly dry lowland forest, dry deciduous thicket and woodland. In the Chirimadzi Valley in the northern area of the concession, the vegetation is sparsely wooded grassland. There is an area of miombo woodland on the southeast boundary of the concession and open undifferentiated woodland in the southwestern section.

METHODS AND TERMINOLOGY

Recognizing the rich plant diversity at Catapú, a survey of the woody species was started. Specimens have

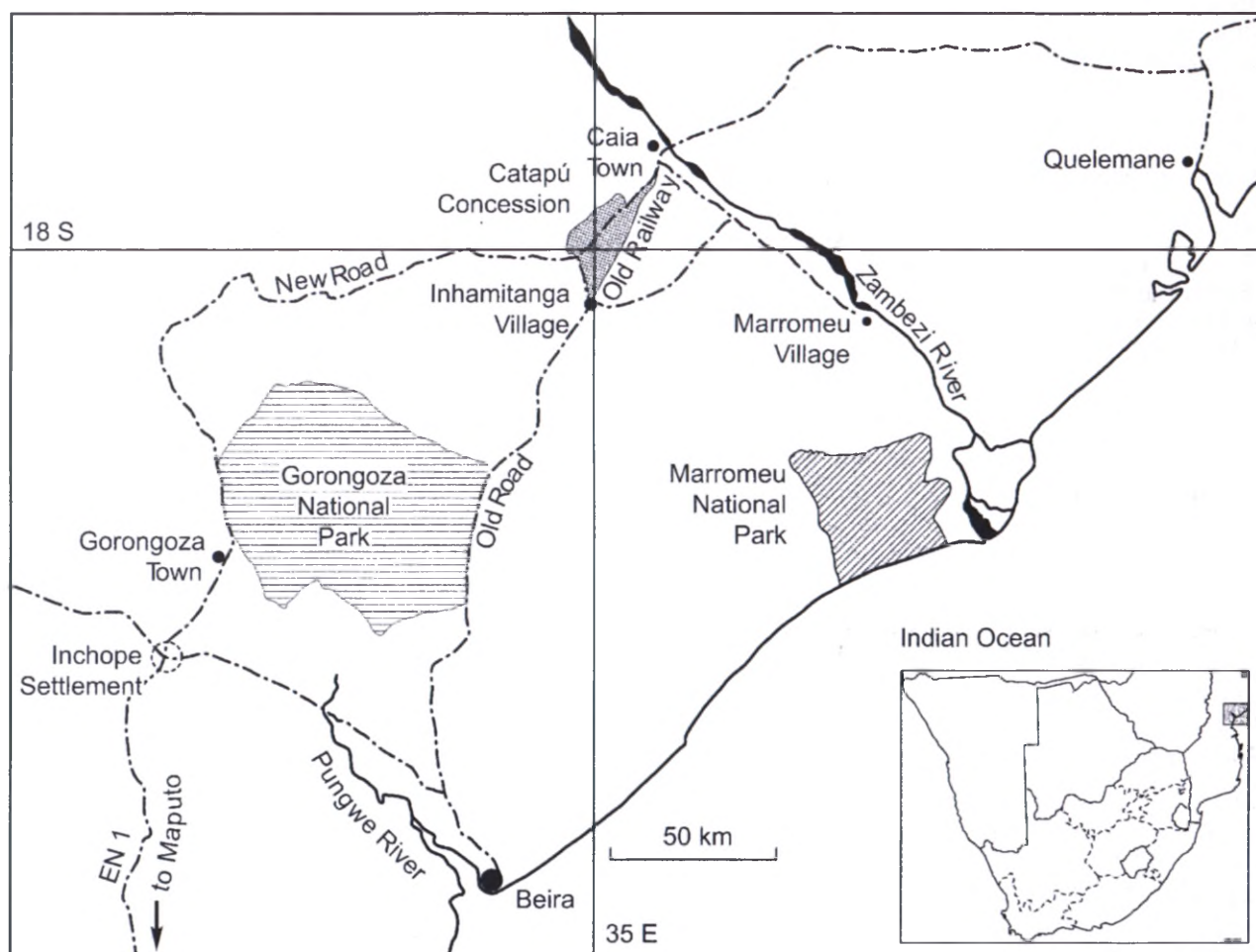


FIGURE 1.—Map showing the location of the study area in central Mozambique. Roads: — · — · — ·.

been collected and voucher specimens prepared which are housed in the recently established field herbarium to be known as the Cheringoma Herbarium (proposed acronym CHER). Any species not identified in the field were taken for identification to the National Herbaria in Harare (SRGH) and Pretoria (PRE). Regional Floras, e.g. *Flore de Moçambique* (1969–), *Flora zambesiaca* (1960–) and *Flora of tropical East Africa* (1952–) have also been used to assist in identification. The scientific names of the plants are based mainly on Coates Palgrave (2002) and Kloppe *et al.* (2006).

Sena names on the list, (Appendix 1, column 4), were checked against species in the field to confirm identification. Aware that the use of plant vernacular names is essentially a spoken language, they have been spelt phonetically. The names were checked against De Koning (1993) where a very broad view was taken of the spelling and the regions in which the names were recorded.

Plants recorded at Catapú were assessed phytogeographically. The checklist of the study area was compared with the preliminary checklist of vascular plants of Mozambique (Da Silva *et al.* 2004) and also with checklists compiled during two recent vegetation and plant surveys in nearby areas, one of the Cabora Bassa shoreline (Timberlake 2002) and the other the Zambezi Delta wetland plant survey (Müller *et al.* 2000). It was also compared with the checklists of two South African forests, Richards Bay forest and the Maputaland forest complex (Geldenhuys 1992) as well as with a mid-Zambezi Valley dry forest biodiversity survey (Hoare *et al.* 2002). The Red Data List, Mozambique (Izidine & Bandeira 2002) was checked for species occurring in the study area.

Very simplified, the following definitions are used for the different broad vegetation types:

Forest has a canopy whose crowns interlock at 10 m or more in height (Hoare *et al.* 2002). A forest is rich in species, but due to the availability of soil moisture, it changes rapidly in composition and physiognomy over quite short distances and is difficult to classify (White 1983). Dry deciduous forest is characteristically found on deep sands which absorb all the incident rainfall or receive lateral seepage water and remain moist throughout the greater part of the dry season (White 1983). Understorey species remain evergreen throughout the year in dry semi-deciduous forest and are deciduous for more than one month in dry deciduous forest (Chapman & White 1970).

Thicket has a canopy between 3–7 m tall formed by the interlocking branches of small trees and multi-stemmed shrubs. The presence of emergent trees over 10 m tall protruding above the canopy or shrub layer is often a feature of thickets (Chapman & White 1970).

Woodland comprises open stands of trees at least 5 m tall, crowns covering at least 20% of the surface, sometimes in lateral contact but crowns not interlocking; grass cover is usually present (Chapman & White 1970).

Zambezi undifferentiated woodland is defined by the absence of miombo and mopane dominants rather than by its own floristic composition. It is composed of

many more tree species than either miombo or mopane woodland. Although the dominants of miombo woodland are normally absent from undifferentiated woodland some of their associated species are frequently present (White 1983).

Miombo is a colloquial term used to describe those central, southern and eastern African woodlands dominated by members of *Brachystegia*, *Julbernardia* and/or *Isoblerlinia*, three closely related genera from the legume family, Fabaceae, subfamily Caesalpinioideae (Campbell *et al.* 1996). It generally occurs on geologically old, nutrient-poor soils in the uni-modular rainfall zone. The shrub layer is variable in density and composition. Ground cover varies from a dense coarse grass growth to a sparse cover of herbs and grasses (Campbell *et al.* 1996).

RESULTS

Floristic analysis

A total of 238 woody species and infraspecific taxa (referred to collectively as species) recorded during the survey are listed in Appendix 1. These represent 59 families and 167 genera. Fabaceae is the largest family, with eight genera and eight species in Caesalpinioideae, seven genera and 20 species in Mimosoideae and 11 genera and 17 species in Papilionoideae, making a total of 26 genera and 45 species, followed by Rubiaceae with 12 genera and 14 species. None of the other families has more than 10 species.

We recorded 191 Sena names (Appendix 1, column 4) for species in the study area of which 77 names are not included in De Koning (1993). The names published in De Koning (1993) are marked with an asterisk, those not marked are names not previously published.

Appendix 1, column 5, presents the phytogeographical distribution of the species in the study area. With the symbol 'T', there are 152 species (64.5%) common to both the East African coastal flora and the southern African flora (FSA) region (Germishuizen & Meyer 2003). With the symbol 'N' denoting those from the north there are 61 species (25.5%) extending southwards from the East African coastal flora. With the symbol 'S' there are 10 (5%) species extending northwards from the southern African flora (FSA) region. There are 14 species (5.6%) with the symbol 'E', which are endemic to the Swahilian/Maputaland Regional Transition Zone. They are: *Acacia torrei*, *Catunaregam swynnertonii*, *Cola mossambicensis*, *Combretum kirkii*, *Cordia stuhlmannii*, *Erythrina livingstoniana*, *Glyphaea tomentosa*, *Hibiscus mossambicensis*, *Millettia mossambicensis*, *Monodora stenopetala*, *Ochna angustata*, *Pavetta klotzschiana*, *Tricalysia jasminiflora* and *Vangueria esculenta*. *Ziziphus mauritiana*, included in the checklist is an alien, marked with a (+). *Tamarindus indica* is treated as indigenous (Coates Palgrave 2002). There are 40 species in common with the Maputaland-Pondoland Regional Mosaic as shown in Appendix 1, column 6.

Comparison with Da Silva *et al.* (2004) Appendix 1, column 7, shows that of the 240 species on the Catapú

checklist, 38 species can be added as occurring in Sofala Province and an additional 22 as occurring both in Sofala Province and in Mozambique. New records of particular interest are *Dovyalis xanthocarpa*, a new record for Mozambique; new for Sofala and south of the Zambezi River include *Cordia torrei*, *Grewia forbesii*, *Zanthoxylum holtzianum*, also interesting is *Combretum kirkii*, with a very limited distribution along the Zambezi Valley; *Elaeodendron transvaalense* has not previously been recorded as far north as this (R. Archer pers. comm.).

The Zambezi Delta survey (Müller *et al.* 2000) included six days spent at Coutada 11, GPS reading S18°33'11", E36°06'02", a hunting concession not very far from Catapú. It was anticipated that many of the woody species at Catapú would appear on that list of plants recorded for the forest and woodland columns in the survey. But Appendix 1, column 8, shows 86 species in common. Lake Cabora Bassa is situated on the Zambezi River in Tete Province upstream from the study area. The result of the comparison with that shoreline survey (Appendix 1, column 9) shows that 152 species on the Catapú checklist were recorded. Of the Catapú checklist, 59 species appeared on both the previously mentioned lists and 60 species did not occur on either list. Although 162 species (68%) of the plants on the Catapú checklist occur in the FSA region, only 40 species (17%) occur in the Maputaland/Pondoland Regional Mosaic (Appendix 1, column 6).

In the mid-Zambezi Valley dry forest biodiversity survey (Hoare *et al.* 2002), no checklist was presented, but a list of 36 species considered to be indicator species of dry forest was given. Of those, 20 species occur in the study area, *Kirkia acuminata* and *Schinziophyton rautanenii* are infrequent and found mainly in woodland and the shrubs *Citropsis daweanae* and *Zanthoxylum leprieurii* are only occasional. *Cleistochlamys kirkii* and *Monodora junodii* are classified as shrubs, the former described as being tall trees in the description of the vegetation to follow and the latter is distinctly a tree of 3 to 4 m tall. *Xylothea tettensis* is plentiful in the study area. *Xylia torreana* is considered an indicator of dry forest and thicket and is very much a constituent of the forest vegetation in the study area.

Conservation status

Eleven species on the Catapú checklist have been included in the Red Data List for Mozambique (Izidine & Bandeira 2002). Only three are considered vulnerable: *Acacia torrei* VU D2, *Cola mossambicensis* VU A1a and *Sterculia appendiculata* VU A1ad. Izidine & Bandeira (2002) comment that regeneration in *Sterculia appendiculata* is difficult. In the study area, however, this species coppices very readily. On the edge of Via Pungue where the roots were disturbed by a bulldozer when the road was being constructed, there has been a proliferation of saplings growing from root shoots, some now \pm 4 m tall. *Azelia quanzensis* is given a Threatened status in Mozambique by Bandeira *et al.* (1994), Lower-Risk Near Threatened (Izidine & Bandeira 2002), and as Vulnerable (Da Silva *et al.* 2004), citing that large quan-

ties are being cut for timber, charcoal and fuel wood production.

Two species, *Acacia adenocalyx* and *Amblygonocarpus andongensis* are incorrectly listed as Mozambique endemics and rated VU D2 in Da Silva *et al.* (2004) but not included in Izidine & Bandeira (2002). *Acacia adenocalyx* is not an endemic to Mozambique, as it also occurs in Kenya and Tanzania (Ross 1979) and in the study area it is widespread and invasive. *Amblygonocarpus andongensis* has a wide distribution, occurring as far afield as Namibia, Botswana, Zambia and in the savanna regions of tropical Africa (Brenan 1970). It is also fairly widespread in Mozambique.

Vegetation types

The study area comprises a mosaic of three vegetation types: dry deciduous forest, dry deciduous thicket and woodland. Areas of lowland deciduous forest, with the canopy usually \pm 20 m high, but varying from 12 to 25 m and not always continuous, are very patchy but there are good examples along the road known as Via Pungue, in the area west of the EN-1 and just south of Mashamba Grande and an area east of the EN-1 just north of Chapa. Nearly all the canopy species are deciduous but there is considerable variation from species to species and from year to year. The dominant trees emergent above the canopy are *Adansonia digitata*, *Berchemia discolor*, *Bivinia jalbertii*, *Bombax rhodognaphalon*, *Milicia excelsa*, *Millettia stuhlmannii*, *Morus mesozygia* and *Sterculia appendiculata*. Reaching and forming the canopy at 12 to 25 m are *Azelia quanzensis*, *Balanites maughamii*, *Celtis mildbraedii*, *Cordyla africana*, *Fernandoa magnifica*, *Terminalia sambesiaca* and *Xylia torreana*. Many of the *Terminalia sambesiaca* have died except for some along the EN-1 highway. *Sterculia appendiculata* occurs in dense and open forest.

Below the canopy but reaching up towards it in the sparse understorey, are numerous *Drypetes reticulata*. Also frequent are *Millettia mossambicensis* and *Strychnos usambarensis*. In addition, *Hunteria zeylanica*, *Strychnos henningsii* and *S. potatorum* are found. There is a fairly continuous canopy and very sparse undergrowth with very few to no ferns, herbs or grasses. Some of the understorey shrubs are *Chazaliella abrupta*, *Citropsis daweanae*, *Drypetes arguta*, *Hibiscus mossambicensis*, *Lasciodiscus pervillei*, *Sclerochiton kirkii* and *Zanthoxylum leprieurii*.

Lianes in the study area include *Abrus precatorius*, *Acacia adenocalyx*, *Adenia gummifera*, *Artabotrys brachypetalus*, *Cissus cucumerifolia*, *C. integrifolia*, *C. quadrangularis* and *C. rotundifolia*, *Combretum kirkii*, *C. microphyllum*, *C. padoides*, *Dalbergia arbutifolia*, *Dalbergia fischeri*, *Entada wahlbergii*, *Grewia caffra*, *Hugonia busseana*, *Landolphia kirkii*, *Loeseneriella crenata*, *Opilia celtidifolia*, *Reissantia buechananii*, *R. indica*, *Strophanthus kombe*, *S. petersianus*, *Synaptolepis alternifolia*, *S. kirkii* and *Tiliacora junifera*.

In 1994 there was a devastating fire through parts of the forest. *Acacia adenocalyx* proliferated and totally

overran large areas. Stands were so thick that nothing was able to grow underneath and it also climbed over and smothered surviving trees. This has been cleared in places and one of the pioneer species that regenerated in the cleared areas was *Fernandoa magnifica*. Lianas and climbers also seem to have proliferated as a result of fire damage and in the area known as Mashamba Experimental, a 30 m tall *Gyrocarpus americanus* has fallen, apparently having been pulled down by their weight. In the same section, *Cordia stuhlmannii* and *C. torrei* occur. They seem to have survived the fire or managed to regenerate successfully. Perhaps the latter, as *Cordia torrei* has also been observed along the edge of the road on the EN-1.

Continuing west along Via Pungue, the forest thins towards Mpião Pan and the vegetation becomes open wooded grassland. The scattered trees include remarkably tall *Boscia salicifolia*, *Cleistochlamys kirkii*, *Combretum adenogonium*, *Dalbergia melanoxylon*, *Philenoptera violacea*, *Piliostigma thonningii*, *Sclerocarya birrea* and *Vitex payos*. Some of the smaller species are *Rourea orientalis*, *Senna petersiana* and *Xylothea tettensis*.

Vegetation east of the EN-1 along the road known as Via Entrada, is very difficult to classify as it is an intricate mosaic of forest, thicket and woodland. The canopy varies in height considerably and it is probably best described as dry thicket with some emergent trees over 10 m high. The taller trees are *Azelia quanzensis*, *Albizia harveyi*, *Balanites maughamii*, *Berchemia discolor*, *Blighia unijugata*, *Boscia salicifolia*, *Hymenocardia ulmoides*, *Millettia stuhlmannii*, *Monodora junodii* var. *macrantha*, *Monodora stenopetala*, *Pteleopsis myrtifolia*, *Strychnos madagascariensis* and *Warneckea sansibaricum*. Other trees are *Carpolobia goetzei*, *Gardenia ternifolia*, *Millettia mossambicensis*, *M. usaramensis* and *Rothmannia fischeri*. Some of the shrubs are *Allophylus rubifolius*, *Bauhinia tomentosa*, *Coffea racemosa*, *Cordia pilosissima*, *Dovyalis xanthocarpa*, *Friesodielsia obovata*, *Indigofera ormocarpoides*, *Rourea orientalis* and *Tricalysia jasminiflora*.

East of the Tissadze River along Via Lavu there is a very different picture. In this area there is very much a mosaic of forest, thicket and undifferentiated woodland. There is a canopy of ± 3 to 4 m with tall emergent trees well over 10 m high, such as *Bombax rhodognaphalon*, *Newtonia hildebrandtii* and *Diospyros mespiliformis*, of which, although few and far between, there is no indication of previous logging; *Adansonia digitata*, very tall and slender, is one of the emergents that also occurs in forest. *Millettia stuhlmannii* is easily identified with characteristic grey-green bark and *Sterculia africana* also has a distinctive bark. Forest species forming the lower canopy are *Dalbergia boehmii*, *Lecaniodiscus fraxinifolius* with characteristic pale bark (can also become very tall), *Drypetes reticulata*, *Strychnos madagascariensis* and *Trichilia capitata*. On the termite mounds are *Lecaniodiscus fraxinifolius*, *Spirostachys africana*, *Tamarindus indica* and the occasional *Lannea schweinfurthii*.

Usually considered woodland species, and contributing to the thicket canopy are *Albizia anthelminthica*, *Combretum adenogonium*, *C. hereroense*, *Terminalia sericea*, *Drypetes mossambicensis*, *Schrebera trichoclada*, *Sclerocarya birrea* (which becomes very tall in semi-closed forest but in the open remains far more squat) and *Strychnos madagascariensis*. *Spirostachys africana* occurs in clumps, sometimes forming pure stands of its own little forest, as does *Cleistochlamys kirkii*. Tall *Acacia nigrescens*, *Crossopteryx febrifuga* and *Kigelia africana* are found on the fringes and in open forest, as are *Acacia robusta* subsp. *usambarensis*, which appear to be dying around the pans, possibly as a result of past dry years. *Combretum imberbe* also occurs around the pans and on the heavier soils.

In the more scrubby forest/woodland mosaic *Diospyros loureiriana* and *D. senensis* are found. *Balanites maughamii* occurs in deep forest and in scrub forest. Sometimes in the woodland areas there is a tall grass cover and at others, shrubs, which include *Dovyalis hispidula*, *Friesodielsia obovata*, *Grewia forbesii*, *G. inaequilatera*, *G. lepidopetala*, *Holarrhena pubescens*, *Hoslundia opposita* (an up to 2 m shrub in the study area), *Margaritaria discoidea*, *Markhamia obtusifolia*, *M. zanzibarica*, *Ozoroa obovata* subsp. *obovata* and *Phyllanthus ovalifolius*.

Sporadically there is an almost park-like opening in the forest/thicket with a grass cover and very tall woodland trees up to 10 m high and very few shrubs. Trees recorded in those areas include *Acacia nigrescens*, *A. robusta* subsp. *usambarensis*, *Boscia salicifolia*, *Combretum hereroense*, *Dalbergia melanoxylon*, *Philenoptera violacea* and *Terminalia sericea*.

North from the Catapú turn-off along the EN1 as the road drops down to Tissadze and Chirimadzi River Valleys, where the altitude is ± 50 –100 m, the trees gradually become less forest and more woodland species. The river valley is open grassland with solitary trees or clumps of trees and bushes including *Acacia robusta* subsp. *usambarensis*, *A. polyacantha*, *A. xanthophloea*, *Combretum imberbe*, *Ficus sycomorus*, *Hyphaene coriacea* and *Xanthocercis zambesiaca*, all indicative of a high water table.

On the Zangue terrace along Via Santove grows the little known Mozambique endemic, *Acacia torrei* on black soils, and three palm species, *Borassus aethiopum*, *Hyphaene coriacea* and *Phoenix reclinata*. Other species are: *Acacia galpinii*, *A. polyacantha*, *A. sieberiana* var. *sieberiana*, *Albizia versicolor*, *Croton megalobotrys*, *Grewia sulcata*, *Margaritaria discoidea*, *Pluchea dioscoridis* and *Sclerocarya birrea*.

The area of miombo woodland next to the Tissadze River bridge on the Inhamitanga road is obviously situated on nutrient-poor soils. The trees are widely spaced, there is a poor grass cover and few shrubs. The woody vegetation seems to be mainly concentrated on termite mounds, adjacent to small pans or along the bank of the Tissadze River. These include large *Cleistochlamys kirkii*, *Dovyalis hispidula*, *Flueggea virosa*, *Strychnos*

potatorum, a large *Tamarindus indica* (covered with a *Dalbergia arbutifolia*), *Trichilia capitata* and *Ziziphus mucronata*. Of the Miombo species only *Brachystegia spiciformis* was recorded. There is no continuous canopy and other trees scattered around are *Acacia nilotica*, *A. robusta* subsp. *usambarensis*, *Diospyros loureiriana*, *Philenoptera violacea*, *Schrebera trichoclada* and *Vangueria infausta*. Close to the river bank next to a huge *Sclerocarya birrea* is an 8 m tall *Brackenridgea zanguebarica*.

Logging and conservation

Millettia stuhlmannii known in the timber trade as *panga-panga*, *jambiri* and partridgewood, *Azelia quanzenensis* (*chamfuta/chanfuta*), *Cordyla africana* (*mutondo*) and other hardwoods have been logged extensively throughout Mozambique for the last 100 years and continue to be today. Almost all logging has taken place on a non-renewable basis (pers. obs.). Judged from the height of many isolated very tall trees, particularly solitary baobabs, *Adansonia digitata*, and *Sterculia appendiculata*, trees that are not exploited for their wood, it is suggested that forest was more prevalent in central Mozambique in the past than is now apparent. Furthermore, those that remain are frequently being replaced by rural settlement and cultivation (pers. obs.; Izidine & Bandeira 2002; Schipper & Burgess 2004), with the result that much of the extensive forest that once covered especially the coastal areas of Mozambique, has disappeared.

Although Catapú is a timber concession, only certain species are felled. The three targeted species have the ability to coppice and silvicultural follow-up operations are now conducted on all stumps that have been logged. There is also an active programme of re-planting of *Millettia*, *Cordyla* and *Azelia*. The seedlings are raised in a small nursery adjacent to the sawmill and currently some 10 000 seedlings are planted out into the logged areas each year in early summer with the first rains. This represents roughly four times the number of trees that are felled in the concession each year. The growth of the seedlings, those which have escaped the attention of the porcupines, in some places has been remarkable. For instance, of 34 plants propagated in ground seedbeds in Nov. 1997, dug up and replanted in the field in Oct. 1998, 20 survived and measurements taken in October 2005 show an average height of 4.15 m with an average trunk diameter of 140 mm. Obviously the average of 126 mm of rain which falls in the dry season enables the deep sands to remain moist throughout the greater part of the year.

A conservation/sensitive forest area of $\pm 4\,000$ hectares within the firebreak around the sawmill and residential area has been established. This includes many different vegetation communities and has now been protected from fire for six years. Although woodland and miombo vegetation types in the study area tolerate burning and are even dependent on it for maintaining their structure, this area of forest has clearly not evolved with fire as a natural factor. Such intolerance to fire is also seen in Sand (Licuáti) Forest on the coastal plains of

Maputaland in southern Mozambique. Currently fire is increasingly introduced into forest patches with the slash and burn agricultural activities of an expanding human population.

DISCUSSION

Checklists of plants have an important role beyond the call for simple inventories of species. They serve as foundations for the enumeration of flora and vegetation in given areas. This paper also serves to demonstrate the diversity of woody species and vegetation types within a small area. Comparisons of the Catapú checklist with checklists of the surveys in nearby regions, confirm the convergence of several floristic and vegetation elements resulting in the richness and unique composition of the vegetation at Catapú.

When a plant has a name it has an identity, and the inclusion of vernacular names in a checklist has the potential to increase communication during field work. The trees at Catapú have been numbered and tagged, their exact position recorded and voucher specimens prepared. This has resulted in a living reference collection, cross-referenced to herbarium specimens, available on site, an important contribution to any future botanical study or field work in the area.

The present survey shows that 181 species recorded in the study area at Catapú were also recorded by one or other of the two available Zambezi River Valley vegetation surveys. A total of 60 species on the Catapú list were not included in either of the Zambezi River Valley vegetation surveys. Furthermore, this checklist is essentially a list of woody species and is an ongoing exercise but when ferns, herbs, geophytes and grasses are taken into account, the diversity will prove considerable.

There is a so-called forest reserve, the Inhamitanga Forest Reserve, a 2 km wide belt (1 km on either side of the road) on the Inhamitanga-Chupanga road, which starts at Inhamitanga Village on the southeastern boundary of Catapú, where the railway line and road meet, and runs for ± 10 km. Although it is marked on most of the 1: 250 000 maps of the area, very few people know of its existence and there is no formal protection of the reserve. It falls within Coutada 12, the hunting concession on the Catapú eastern boundary, so no timber concessions or simple cutting licenses can be issued in the area. The damage to the reserve so far has been very limited but like all Mozambique's forests they face the constant threat to slash and burn settlement, the risk of fire damage and of fuel-wood collection.

Not included in the checklist are at least another 10 or more tree species known to occur in the area but not yet found on Catapú. Hence the importance of this study which it is hoped can be extended to cover the rest of the Cheringoma area, including the Inhamitanga Forest Reserve and adjacent hunting concessions where the vegetation is probably protected to some extent, particularly against the ravages of extensive slash and burn settlement. An increased conservation initiative in this

area is urgently required, together with further biological studies. It is essential to know what is there before measures can be taken to save it.

We believe there is a very strong case for the whole Cheringoma area to be declared an Important Plant Area (Smith 2004) as it fulfills the following criteria; the site contains restricted range species (narrow endemics), has a botanical diversity with a high number of species and is a regionally threatened habitat. The area forms part of the Southern Zanzibar-Inhambane Coastal Forest Mosaic, an ecoregion of which the conservation status is 'critical' (Schipper & Burgess 2004). Furthermore, the Cheringoma area also falls within the Coastal Forests of Eastern Africa Hotspot (Burgess *et al.* 2004), one of 34 such regions identified as Earth's biologically richest and most endangered terrestrial ecoregions.

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APPENDIX 1.—A checklist of woody species at Catapú

1 Taxon	2 Voucher No.	3 Growth form†	4 Sena name	5 Distr.	6 Gel.	7 DaS	8 Mul.	9 Tim.
Acanthaceae								
<i>Ruspolia hypocrateriformis</i> (Vahl) Milne-Redh. var. <i>australis</i> Milne-Redh.	<i>Cher58</i>	ST		N	0	NM	0	0
<i>Sclerochiton kirkii</i> (T.Anderson) C.B.Clarke	<i>Cher99, 100</i>	ST		N	0	NS	0	0
Anacardiaceae								
<i>Lannea schweinfurthii</i> (Engl.) Engl. var. <i>stuhlmanni</i> (Engl.) Kokwaro	<i>M78</i>	T	N'tchilussua*	T	0	1	1	1
<i>Ozoroa obovata</i> (Oliv.) R.Fern. & A.Fern. var. <i>obovata</i>	<i>Cher33</i>	T	Nkhataussalu*	T	1	1	1	0
<i>Sclerocarya birrea</i> (A.Rich.) Hochst. subsp. <i>caffra</i> (Sond.) Kokwaro	<i>M119</i>	T	N'fula*	T	2	1	1	1
Annonaceae								
<i>Annona senegalensis</i> Pers. subsp. <i>senegalensis</i>	<i>Cher56</i>	T	Mulembe*	T	2	NS	1	0
<i>Artabotrys brachypetalus</i> Benth.	<i>M106</i>	LS	Nfazi*	T	0	NS	1	1
<i>Cleistochlamys kirkii</i> (Benth.) Oliv.	<i>Cher35</i>	T	Nhongolo*	T	0	1	1	1
<i>Friesodielsia obovata</i> (Benth.) Verd.	<i>M85</i>	ST	N'tsinga*	N	0	1	0	1
<i>Monodora junodii</i> Engl. & Diels var. <i>macrantha</i> J.Paiva	<i>Cher5</i>	T		T	0	T	1	1
<i>Monodora stenopetala</i> Oliv.	<i>Cher76</i>	T	Nsiwi*	E	0	1	0	1
<i>Uvaria lucida</i> Benth. subsp. <i>virens</i> (N.E.Br.) Verdc.	<i>M103</i>	LS	Nunde	T	0	1	0	0
Apiaceae								
<i>Steganotaenia araliacea</i> Hochst. var. <i>araliacea</i>	<i>M143</i>	T	N'dhudhu-nhanga*	T	0	1	0	1
Apocynaceae								
<i>Diplorhynchus condylocarpon</i> (Müll.Arg.) Pichon	<i>JAW2</i>	T	Nhanthomole*	T	0	1	1	1
<i>Holarrhena pubescens</i> (Buch.-Ham.) Wall. ex G.Don.	<i>Cher36</i>	TS	Khumba yaa ndzo	T	0	1	0	1
<i>Hunteria zeylanica</i> (Retz.) Gardner ex Thwaites var. <i>africana</i> (K.Schum.) Pichon	<i>Cher28, 37</i>	TS	N'dhudhu-nhanga de floresta*	N	0	1	0	0
<i>Landolphia kirkii</i> T-Dyer ex Hook.f.	<i>Cher38</i>	LS	Mamungu*	T	1	NS	1	0
<i>Strophanthus kombe</i> Oliv.	<i>Cher39</i>	LS	Tribadeila	T	0	1	0	1
<i>Strophanthus petersianus</i> Klotzsch	<i>Cher40</i>	LS		T	0	1	0	1
<i>Tabernaemontana elegans</i> Stapf	<i>M65, 71</i>	T	N'caucau*	T	1	1	1	0
Areaceae								
<i>Borassus aethiopum</i> Mart.	<i>s.n.</i>	P	N'dhikhua	T	0	NM	1	0
<i>Hyphaene coriacea</i> Gaertn.	<i>M161</i>	P	N'tcheu	T	0	NM	1	0
<i>Phoenix reclinata</i> Jacq.	<i>s.n.</i>	P	N'tchiendo	S	1	NM	1	0
Asteraceae								
<i>Pluchea dioscoridis</i> (L.) DC.	<i>Cher50</i>	T	N'dvuvu*	T	0	1	1	1
<i>Vernonia colorata</i> (Willd.) Drake subsp. <i>colorata</i>	<i>M174</i>	ST		T	0	1	1	0

Column 1: taxon, author name

Column 2: voucher no., collectors' abbreviations: Cher, Cheringoma herbarium accession no.; DP, David Peta; JAW, James White; M, Meg Coates Palgrave; MJJ, Mario Jose Inacio; qg, quick guide no.

Column 3: growth form: T, tree; S, shrub over 2 m; L, liane; P, herbaceous perennial.

Column 4: Sena name, * published in De Koning (1993).

Column 5: Distr., phytogeographical distribution: N, northerly distribution, occurring mainly north of the study area; S, southerly distribution, occurring mainly south of the study area; T, distribution transitional, occurring both north and south of the study area; E, species endemic to the Swahilian/Maputaland Regional Transition Zone; *Ziziphus mauritiana*, marked +, an alien, is included in the list. *Tamarindus indica* is considered to be indigenous for the area (Coates Palgrave 2002).

Column 6: Gel., Geldenhuys (1992): 0, absent; 1, present.

Column 7: DaS, Da Silva *et al.* (2004): 1, present; NS, absent or not recorded for Sofala; NM, absent or not recorded for Mozambique.

Column 8: Mul., Müller *et al.* (2000): 1, present; 0, absent.

Column 9: Tim., Timberlake (2002): 1, present; 0, absent.

APPENDIX 1.—A checklist of woody species at Catapú (cont.)

1 Taxon	2 Voucher No.	3 Growth form†	4 Sena name	5 Distr.	6 Gel.	7 DaS	8 Mul.	9 Tim.
Balanitaceae								
<i>Balanites maughamii</i> Sprague subsp. <i>maughamii</i>	M83	T	N'soconondo	T	2	1	0	1
Bignoniaceae								
<i>Fernandoa magnifica</i> Seem.	M121	T	N'culue	N	0	1	0	0
<i>Kigelia africana</i> (Lam.) Benth.	M139	T	N'vunguti*	T	0	1	1	1
<i>Markhamia obtusifolia</i> (Baker) Sprague	M76	T	N'cluvu Nhuvuvuvu N'sevu*	N	0	1	1	1
<i>Markhamia zanzibarica</i> (Bojer ex DC.) K.Schum.	M140	T	Muanambeu Tsueua*	T	0	1	1	1
<i>Stereospermum kunthianum</i> Cham.	MJ16	T	Nhacavunguti	N	0	1	0	1
Bombacaceae								
<i>Adansonia digitata</i> L.	CherM142	T	Himbondeiro Mulambe*	T	0	1	0	1
<i>Bombax rhodognaphalon</i> K.Schum. ex Engl.	M104	T	N'ghuza*	N	0	1	0	1
Boraginaceae								
<i>Cordia goetzei</i> Gürke	MJ13	T	Tchiothamafumu	N	0	NM	1	1
<i>Cordia pilosissima</i> Baker	M113	ST	Mamina a n'gombe	N	0	NS	0	1
<i>Cordia stuhlmannii</i> Gürke	Cher55, 90	T		E	0	NM	0	0
<i>Cordia torrei</i> Martins	Cher61, 66	T	Mamina a n'gombe	N	0	NM	0	0
<i>Ehretia amoena</i> Klotzsch	Cher84	T	Ncanacana	T	0	1	0	1
Burseraceae								
<i>Commiphora edulis</i> (Klotzsch) Engl. subsp. <i>edulis</i>	Cher41	T		T	0	1	0	1
<i>Commiphora zanzibarica</i> (Baill.) Engl.	Cher42	T	Tchinthiko*	T	1	1	0	1
Capparaceae								
<i>Boscia mossambicensis</i> Klotzsch	M221	T		T	0	1	0	1
<i>Boscia salicifolia</i> Oliv.	M134	T	Nhenze*	N	0	1	1	1
<i>Capparis erythrocarpos</i> Isert var. <i>rosea</i> (Klotzsch) DeWolf	Cher93	S	M'phatchocolo	N	0	NS	1	1
<i>Cladostemon kirkii</i> (Oliv.) Pax & Gilg	M148	ST	Ndico za mabhongue	T	0	1	0	1
<i>Maerua angolensis</i> DC.	Cher44	T	Tchidzyambuzi	T	0	1	0	1
<i>Thilachium africanum</i> Lour.	Cher17	ST	Tchikhala-nherere	T	0	1	0	1
Celastraceae								
<i>Elaeodendron transvaalense</i> (Burt Davy) R.H.Archer	Cher 94	T		S	0	NS	0	0
<i>Gymnosporia putterlickioides</i> Loes.	Cher45	T		T	0	NS	0	0
<i>Gymnosporia senegalensis</i> (Lam.) Loes.	Cher46	ST	N'tamba ntsato*	T	2	1	1	1
<i>Loeseneriella crenata</i> (Klotzsch) N.Hallé [= <i>Hippocratea crenata</i> (Klotzsch) K.Shum. & Loes.]	Cher49	SL		T	0	1	0	1

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APPENDIX 1.—A checklist of woody species at Catapú (cont.)

1 Taxon	2 Voucher No.	3 Growth form†	4 Sena name	5 Distr.	6 Gel.	7 DaS	8 Mul.	9 Tim.
Celastraceae (cont.)								
<i>Reissantia buchananii</i> (Loes.) N.Hallé [= <i>Hippocratea buchananii</i> Loes.]	<i>Cher47</i>	SL	Ntutu	N	0	1	0	0
<i>Reissantia indica</i> (Willd.) N.Hallé var. <i>orientalis</i> N.Hallé & Mathew [= <i>Hippocratea indica</i> Willd.]	<i>Cher48</i>	SL		T	0	NS	1	0
Celtidaceae								
<i>Celtis mildbraedii</i> Engl.	<i>Cher51</i>	T	Mpepe	T	0	1	0	0
Clusiaceae								
<i>Garcinia livingstonei</i> T.Anderson	<i>M90</i>	T	M'pimbi*	T	1	1	1	1
Combretaceae								
<i>Combretum adenogonium</i> Steud. ex A.Rich.	<i>M114</i>	T	N'fiti*	N	0	1	0	1
<i>Combretum apiculatum</i> Sond. subsp. <i>apiculatum</i>	<i>M110</i>	T	Cagolo*	T	0	1	0	1
<i>Combretum hereroense</i> Schinz	<i>M93</i>	T	Sindza nchuere*	T	0	1	0	1
<i>Combretum imberbe</i> Wawra	<i>M99</i>	T	Nangali*	T	0	1	1	1
<i>Combretum kirkii</i> M.A.Lawson	<i>Cher53</i>	L		E	0	NS	0	1
<i>Combretum microphyllum</i> Klotzsch	<i>Cher95</i>	L	Nhacaluelue	T	0	1	0	1
<i>Combretum mossambicense</i> (Klotzsch) Engl.	<i>Cher153</i>	SL	N'cotamo*	T	0	1	0	1
<i>Combretum padoides</i> Engl. & Diels	<i>Cher54</i>	ST		T	0	NS	0	1
<i>Combretum pisoniiflorum</i> (Klotzsch) Engl.	<i>M508</i>	L		N	0	1	0	1
<i>Pteleopsis myrtifolia</i> (M.A.Lawson) Engl. & Diels	<i>Cher108</i>	T	Ngolozzi*	T	0	1	1	1
<i>Terminalia sambesiaca</i> Engl. & Diels	<i>Cher109</i>	T	N'culungu*	N	0	1	0	1
<i>Terminalia sericea</i> Burch. ex DC.	<i>M77</i>	T	N'ghodhoni*	T	0	1	0	1
Connaraceae								
<i>Rourea orientalis</i> Baill.	<i>Cher18, 87</i>	S	Nhantsanga	N	0	1	1	0
Convolvulaceae								
<i>Ipomoea verbascoidea</i> Choisy		LS		T	0	1	0	0
Dichapetalaceae								
<i>Tapura fischeri</i> Engl.	<i>Cher2, 110</i>	T	Nhaussanga	T	1	1	1	1
Ebenaceae								
<i>Diospyros loureiriana</i> G.Don subsp. <i>loureiriana</i>	<i>Cher77</i>	TS	Nhandhima*	T	0	1	1	0
<i>Diospyros mespiliformis</i> Hochst. ex A.DC.	<i>M141</i>	T	N'fuma*	T	0	1	1	1
<i>Diospyros senensis</i> Klotzsch	<i>M80</i>	T	Gogoda ya n'thika* Tombo n'thika	N	0	1	1	1
<i>Diospyros squarrosa</i> Klotzsch	<i>JAW1</i>	T	Nhacatsicana	N	0	1	0	1
<i>Euclea schimperi</i> (A.DC.) Dandy	<i>qg215</i>	ST	Nhandema	T	1	NS	1	1
Erythroxylaceae								
<i>Erythroxylum emarginatum</i> Thonn.	<i>Cher83</i>	ST		T	2	1	1	0

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APPENDIX 1.—A checklist of woody species at Catapú (cont.)

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Euphorbiaceae								
<i>Acalypha chirindica</i> S.Moore	<i>Cher59</i>	ST		N	0	NS	0	0
<i>Alchornea laxiflora</i> (Benth.) Pax & K.Hoffm.	<i>Cher19</i>	ST	M'bebe	T	0	1	1	1
<i>Croton megalobotrys</i> Müll.Arg.	<i>Cher89</i>	T		T	0	1	0	1
<i>Erythrococca menyharthii</i> (Pax) Prain	<i>Cher75</i>	ST		T	0	1	0	0
<i>Excoecaria bussei</i> (Pax) Pax	<i>M122</i>	T	Nthavu ya mphonda	T	0	1	0	1
<i>Mildbraedia carpinifolia</i> (Pax) Hutch.	<i>Cher595</i>	T	N'tundunkhadzi	N	0	1	0	0
<i>Schinziophyton rautanenii</i> (Schinz) Radcl.-Sm.	<i>M151</i>	T	N'gomo*	N	0	1	0	0
<i>Spirostachys africana</i> Sond.	<i>M88</i>	T	N'cuniti*	T	1	1	0	0
<i>Suregada zanzibariensis</i> Baill.	<i>Cher155</i>	T	Nsinjamachue*	T	1	1	1	0
Fabaceae: Caesalpinioideae								
<i>Afzelia quanzensis</i> Welw.	<i>M94, 132</i>	T	N'socossa*	T	0	1	1	1
<i>Bauhinia tomentosa</i> L.	<i>Cher73</i>	ST		T	1	1	0	1
<i>Brachystegia spiciformis</i> Benth.	<i>s.n.</i>	T	Missassa* N'sassa*	T	0	1	1	1
<i>Burkea africana</i> Hook.	<i>Cher43</i>	T	N'cimbe*	T	0	1	0	1
<i>Cassia afrodistula</i> Brenan var. <i>patentipila</i> Brenan	<i>M109</i>	TS	Mulumanhyama* Murumanhyama*	T	0	NM	0	0
<i>Piliostigma thonningii</i> (Schumach.) Milne-Redh.	<i>M95</i>	T	N'sekesse*	T	0	1	1	1
<i>Senna petersiana</i> (Bolle) Lock	<i>M73</i>	ST	M'bhuembakhoe*	T	0	1	0	1
<i>Tamarindus indica</i> L.	<i>M91, 102</i>	T	M'bhwemba*	T	0	1	0	1
Fabaceae: Mimosoideae								
<i>Acacia adenocalyx</i> Brenan & Exell	<i>Cher126</i>	SL	Linghato	N	0	NS	0	0
<i>Acacia burkei</i> Benth.	<i>Cher125</i>	T		S	0	1	0	0
<i>Acacia galpinii</i> Burt & Davy	<i>M153</i>	T	N'sheni*	T	0	1	0	1
<i>Acacia nigrescens</i> Oliv.	<i>M115</i>	T	Ncunghu	T	0	1	0	1
<i>Acacia nilotica</i> (L.) Willd. ex Delile subsp. <i>kraussiana</i> (Benth.) Brenan	<i>M191</i>	T	Nhacasadze N'tchissio*	T	0	1	1	1
<i>Acacia polyacantha</i> Willd. subsp. <i>campylacantha</i> (Hochst. ex A.Rich.) Brenan	<i>M166</i>	T	N'ghowe*	T	0	1	1	1
<i>Acacia robusta</i> Burch. subsp. <i>usambarensis</i> (Taub.) Brenan	<i>M64</i>	T	Nsadzi*	T	0	1	0	0
<i>Acacia sieberiana</i> DC. var. <i>sieberiana</i>	<i>Cher124;</i> <i>M147, 163</i>	T	N'ghunga*	N	0	1	0	1
<i>Acacia torrei</i> Brenan	<i>Cher60</i>	SG		E	0	NM	0	0
<i>Acacia xanthophloea</i> Benth.	<i>M152</i>	T	Njerenjere	T	0	NS	1	1
<i>Albizia anthelmintica</i> (A.Rich.) Brongn.	<i>M96</i>	T	N'zanga	T	0	1	0	1
<i>Albizia glaberrima</i> (Schumach. & Thonn.) Benth. var. <i>glabrescens</i> (Oliv.) Brenan	<i>Cher123</i>	T	N'ghedhan'khanga*	N	0	1	0	1
<i>Albizia harveyi</i> E.Fourn.	<i>Cher121</i>	T	N'solola*	T	0	1	0	1
<i>Albizia versicolor</i> Welw. ex Oliv.	<i>M162</i>	T	Tangatanga*	T	0	1	1	1
<i>Albizia zimmermannii</i> Harms	<i>Cher122</i>	T		N	0	1	0	0

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Fabaceae: Mimosoideae (cont.)								
<i>Amblygonocarpus andongensis</i> (Welw. ex Oliv.) <i>Exell & Torre</i>	M155	T	M'bhawawanga*	T	0	NS	0	0
<i>Dichrostachys cinerea</i> (L.) Wight & Arn.	Cher69	ST	Mphangala* Chitsangala*	T	2	1	1	1
<i>Entada wahlbergii</i> Harv.	Cher91	L	Tripadela	T	0	NM	0	0
<i>Newtonia hildebrandtii</i> (Vatke) Torre var. <i>hildebrandtii</i>	M89	T	N'ghuyugyu* N'guiugiu*	T	0	1	0	1
<i>Xylia torreana</i> Brenan	Cher120	T	N'calala*	S	0	1	0	1
Fabaceae: Papilionoideae								
<i>Abrus precatorius</i> L. subsp. <i>africanus</i> Verdc.	M187	L	N'minimini*	T	1	1	1	1
<i>Cordyla africana</i> Lour.	M156	T	N'tondo*	T	1	NM	0	1
<i>Craibia zimmermannii</i> (Harms) Dunn	M217	T		T	2	1	0	0
<i>Dalbergia arbutifolia</i> Baker subsp. <i>arbutifolia</i>	Cher130	L	N'tsinda	N	0	1	0	1
<i>Dalbergia boehmii</i> Taub. subsp. <i>boehmii</i>	Cher131	T		N	0	1	0	1
<i>Dalbergia fischeri</i> Taub.	Cher82	L		N	0	1	0	1
<i>Dalbergia melanoxylon</i> Guill. & Perr.	M74	T	M'phingwe* Pau-preto	T	0	1	0	1
<i>Erythrina livingstoniana</i> Baker	Cher132	T	Chinungu N'angalan'goma	E	0	1	1	1
<i>Indigofera ormocarpoides</i> Baker	M160	ST	Nhacampete*	T	0	NS	0	1
<i>Millettia mossambicensis</i> J.B. Gillett	Cher133	T	N'sangala	E	0	1	0	0
<i>Millettia stuhlmannii</i> Taub.	Cher136	T	M'pangiri* Panga-panga*	T	0	1	1	0
<i>Millettia usaramensis</i> Taub. subsp. <i>australis</i> J.B. Gillett	Cher135	T	Nsangala dzinza	N	0	1	1	0
<i>Philenoptera bussei</i> (Harms) Schrire	M127	T		N	0	1	0	1
<i>Philenoptera violacea</i> (Klotze) Schrire	M116	T	M'phacassa*	T	0	1	1	1
<i>Pterocarpus angolensis</i> DC.	M150	T	Umbila*	T	0	1	1	1
<i>Xanthocercis zambesiaca</i> (Baker) Dumaz-le-Grand	Cher81	T		T	0	1	0	1
<i>Xeroderris stuhlmannii</i> (Taub.) Mendonça & E.P. Sousa	M117	T	Mulonde*	T	0	1	1	1
Flacourtiaceae								
<i>Bivinia jalbertii</i> Tul.	Cher103	T		N	0	1	0	0
<i>Casearia gladiiformis</i> Mast.	Cher11	T	Nhamauira	T	0	1	0	0
<i>Dovyalis hispida</i> Wild	Cher112	ST	Nhacitje N'tudza* N'tutu Nyacsinge	N	0	1	0	0
<i>Dovyalis xanthocarpa</i> Bullock	M130	ST		N	0	NM	0	0
<i>Flacourtia indica</i> (Burm.f.) Merr.	M70	T	N'tchumbutchumbu* N'tudza*	T	0	1	0	1
<i>Oncoba spinosa</i> Forssk.	MJI132	T		T	0	1	0	0

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Hernandaceae								
<i>Gyrocarpus americanus</i> Jacq. subsp. <i>africanus</i> Kubitzki	<i>Cher65</i>	T		T	0	NS	0	1
Kigeliaceae								
<i>Xylothea tettensis</i> (Klotzsch) Gilg var. <i>macrophylla</i> (Klotzsch) Wild	<i>Cher113</i>	TS	Ncanacana Nchenamadzi*	N	0	1	1	1
Kirkiaceae								
<i>Kirkia acuminata</i> Oliv.	<i>Cher165</i>	T	N'tun'gundua	T	0	1	0	1
Lamiaceae								
<i>Clerodendrum eriophyllum</i> Gürke	<i>Cher71</i>	TS		N	0	1	0	0
<i>Hoslundia opposita</i> Vahl	<i>JAW3</i>	S	Tsuimbatsuiru*	T	0	1	1	0
<i>Premna senensis</i> Klotzsch	<i>MJI60</i>	ST	Tsuimbatsuiru	N	0	NS	0	0
<i>Vitex ferruginea</i> Schumach. & Thonn.	<i>Cher114</i>	T		T	0	NS	0	1
<i>Vitex payos</i> (Lour.) Merr.	<i>M63</i>	T		N	0	NS	1	1
<i>Vitex petersiana</i> Klotzsch	<i>Cher74</i>	ST		N	0	NS	1	1
Linaceae								
<i>Hugonia busseana</i> Engl.	<i>Cher115</i>	SL	Gonadzololo	N	0	1	1	1
Malvaceae								
<i>Hibiscus mossambicensis</i> Gonc.	<i>M169</i>	ST		E	0	1	0	0
Melastomataceae								
<i>Warneckea sansibaricum</i> (Taub.) Jacq.-Fél.	<i>M201</i>	T	Nhacateme	N	0	1	1	0
Meliaceae								
<i>Khaya anthotheca</i> (Welw.) C.DC.	<i>MJI5</i>	T	M'bhaua*	N	0	1	0	0
<i>Trichilia capitata</i> Klotzsch	<i>Cher67, 116, 118</i>	T	N'ghonamadjiwa	N	0	1	0	1
<i>Trichilia emetica</i> Vahl subsp. <i>emetica</i>	<i>qg142</i>	T	N'sikiri*	T	2	1	1	1
<i>Turraea nilotica</i> Kotschy & Peyr.	<i>Cher117</i>	T	Ncanacana	T	0	1	0	1
Menispermaceae								
<i>Tiliacora funifera</i> (Miers) Oliv.	<i>Cher152; M195</i>	L		T	0	1	1	1
Moraceae								
<i>Ficus bussei</i> Warb. ex Mildbr. & Burret	<i>MJI8</i>	T	N'towe*	N	0	1	0	1
<i>Ficus ingens</i> (Miq.) Miq.	<i>M118</i>	T	N'towe*	T	1	NS	0	0
<i>Ficus stuhlmannii</i> Warb.	<i>Cher128</i>	T	N'towe*	T	0	1	0	0
<i>Ficus sycomorus</i> L. subsp. <i>sycomorus</i>	<i>M159</i>	T	N'savu	T	0	1	1	1
<i>Ficus tremula</i> Warb. subsp. <i>tremula</i>	<i>Cher127</i>	T	N'thowe*	T	0	1	0	0

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Moraceae (cont.)								
<i>Maclura africana</i> (Bureau) Corner	M120	SL	N'dhowa*	T	0	1	1	1
<i>Milicia excelsa</i> (Welw.) C.C.Berg	DP1	T	N'ghunda*	T	0	NS	0	0
<i>Morus mesozygia</i> Stapf ex A.Chev.	Cher129	T	N'codzi	T	1	1	0	0
Ochnaceae								
<i>Brackenridgea zanguebarica</i> Oliv.	Cher86	T	Ncana-ncana*	T	0	1	0	1
<i>Ochna angustata</i> N.Robson	M510	ST		E	0	1	0	0
Oleaceae								
<i>Ximenia americana</i> L. var. <i>microphylla</i> Welw. ex Oliv.	M204	ST		S	1	1	0	1
<i>Ximenia caffra</i> Sond. var. <i>natalensis</i> Sond.	M98	T	Ntenguene* Ntenguere*	T	2	1	0	1
Oleaceae								
<i>Jasminum stenolobum</i> Rolfe	Cher157	L		T	0	1	0	1
<i>Schrebera trichoclada</i> Welw.	M145		N'combegu	T	0	1	0	1
Opiliaceae								
<i>Opilia amentacea</i> Roxb. [= <i>Opilia celtidifolia</i> (Guill. & Perr.) Endl. ex Walp.]	M194, 199			S	0	NS	0	0
Passifloraceae								
<i>Adenia gummifera</i> (Harv.) Harms	M157		Mole*	T	0	NS	0	1
Phyllanthaceae								
<i>Antidesma venosum</i> E.Mey. ex Tul.	M124	T	Mungalamunhu* N'tchiviri Nthangalamunhu*	T	2	1	1	1
<i>Bridelia cathartica</i> G.Bertol. subsp. <i>melanthesoides</i> (Baill.) J.Léonard	Cher21	ST		T	2	NS	1	1
<i>Cleistanthus schlechteri</i> (Pax) Hutch.	M112	T	N'cua*	T	1	NS	1	0
<i>Flueggea virosa</i> (Roxb. ex Willd.) Voigt subsp. <i>virosa</i>	M75	ST	N'sossoto*	T	0	NS	1	1
<i>Hymenocardia ulmoides</i> Oliv.	Cher2	T	Nchinkhue*	T	0	NS	0	0
<i>Margaritaria discoidea</i> (Baill.) G.L.Webster var. <i>triplosphaera</i> Radcl.-Sm.	Cher72	T	Ncalassi Ntsanzayadziua	N	0	NS	0	0
<i>Phyllanthus ovalifolius</i> Forssk.	Cher97	ST		N	0	NS	1	0
<i>Phyllanthus reticulatus</i> Poir.	M62	ST		T	1	1	1	1
<i>Pseudolachnostylis maprouneifolia</i> Pax	M125	T	N'toto*	T	0	1	0	1
<i>Uapaca</i> sp. cf. <i>U. nitida</i> & <i>U. sansibarica</i>	M172	T		-	-	-	-	-
Polygalaceae								
<i>Carpolobia goetzei</i> Gürke	Cher92	T	N'tenja*	N	0	1	1	0
<i>Securidaca longepedunculata</i> Fresen.	Cher70; M158	T	M'pupu*	T	0	1	0	1

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Putranjivaceae (cont.)								
<i>Drypetes arguta</i> (Müll.Arg.) Hutch.	<i>Cher22</i>			T	2	1	0	0
<i>Drypetes mossambicensis</i> Hutch.	<i>Cher23</i>			T	0	1	0	1
<i>Drypetes reticulata</i> Pax	<i>Cher3, 24, 25</i>		N'thassica	T	0	1	0	0
Rhamnaceae								
<i>Berchemia discolor</i> (Klotzsch) Hemsl.	<i>M138</i>	T	N'tatcha*	T	1	1	1	1
<i>Lasciodiscus pervillei</i> Baill. subsp. <i>pervillei</i>	<i>Cher15, 62</i>	ST		T	0	NS	0	0
<i>Ziziphus abyssinica</i> Hochst. ex A.Rich.	<i>M61</i>	T	N'tsao-tsanga*	N	0	NS	0	0
<i>Ziziphus mauritiana</i> Lam.	<i>M66</i>	T	N'sao*	+	0	1	0	1
<i>Ziziphus mucronata</i> Willd.	<i>M111</i>	T	N'tchatchane*	T	1	1	1	1
<i>Ziziphus pubescens</i> Oliv.	<i>Cher88</i>	T	N'suinga mamina	T	0	1	0	1
Rhizophoraceae								
<i>Cassipourea euryoides</i> Alston	<i>s.n.</i>	T		T	0	1	0	0
Rubiaceae								
<i>Afrocanthium racemulosum</i> (S.Moore) Lantz var. <i>racemulosum</i>	<i>Cher137</i>	T		N	0	NM	0	0
<i>Catunaregam swynnertonii</i> (S.Moore) Bridson	<i>Cher64</i>	T	Nyacapumba	E	0	NS	1	1
<i>Chazaliella abrupta</i> (Hiern) E.M.A.Petit & Verdc. var. <i>abrupta</i>	<i>Cher20, 98</i>	S		N	0	NM	1	1
<i>Coffea racemosa</i> Lour.	<i>Cher16, 148</i>	ST		S	1	1	1	0
<i>Crossopteryx febrifuga</i> (Afzel. ex G.Don) Benth.	<i>M72</i>	T	Fititonga	T	0	1	1	1
<i>Gardenia ternifolia</i> Schumacher & Thonn. subsp. <i>jovis-tonantis</i> (Welw.) Verdc. var. <i>goetzei</i> (Stapp & Hutch.) Verdc.	<i>Cher139</i>	T		T	0	1	0	1
<i>Heinsia crinata</i> (Afzel.) G.Taylor subsp. <i>parviflora</i> (K.Schum. & K.Krause) Verdc.	<i>Cher96, 140</i>	ST	N'tanha	T	0	1	0	0
<i>Oxyanthus latifolius</i> Sond.	<i>Cher141</i>	ST	Nghona-alendo	T	0	NS	1	0
<i>Pavetta klotzschiana</i> K.Schum.	<i>Cher142</i>	ST		E	0	NS	1	1
<i>Rothmannia fischeri</i> (K.Schum.) Bullock subsp. <i>moramballae</i> (Hiern) Bridson	<i>M131</i>	T		T	0	NS	0	1
<i>Tricalysia jasminiflora</i> (Klotzsch) Benth. & Hook.f. ex Hiern var. <i>jasminiflora</i>	<i>Cher143</i>	ST	Tchidyakamba	E	0	1	1	0
<i>Tricalysia junodii</i> (Schinz) Brenan	<i>MJ195</i>	ST		S	0	NS	0	1
<i>Vangueria esculenta</i> S.Moore	<i>Cher4</i>	T	N'zuiro	E	0	1	0	0
<i>Vangueria infausta</i> Burch. subsp. <i>infausta</i>	<i>Cher85</i>	T	N'zuiro*	T	2	1	1	1
Rutaceae								
<i>Citropsis daweani</i> Swingle & M.Kellerm.	<i>Cher145</i>	ST		N	0	1	0	1
<i>Vepris lanceolata</i> (Lam.) G.Don	<i>Cher146</i>	ST	Nhatchetche	S	2	1	0	0
<i>Zanthoxylum holtzianum</i> (Engl.) P.G.Waterman	<i>M108</i>	T		N	0	NM	0	0
<i>Zanthoxylum leprieurii</i> Guill. & Perr.	<i>Cher119</i>	ST		T	0	1	0	1

Column 1: taxon, author name

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Column 3: growth form: T, tree; S, shrub over 2 m; L, liane.

Column 4: Sena name, * published in De Koning (1993).

Column 5: Distr., phytogeographical distribution: N, northerly distribution, occurring mainly north of the study area; S, southerly distribution, occurring mainly south of the study area; T, distribution transitional, occurring both north and south of the study area; E, species endemic to the Swahilian/Maputaland Regional Transition Zone; *Ziziphus mauritiana*, marked +, an alien, is included in the list. *Tamarindus indica* is considered to be indigenous for the area (Coates Palgrave 2002).

Column 6: Gel., Geldenhuys (1992): 0, absent; 1, present.

Column 7: DaS, Da Silva *et al.* (2004): 1, present; NS, absent or not recorded for Sofala; NM, absent or not recorded for Mozambique.Column 8: Mul., Müller *et al.* (2000): 1, present; 0, absent.

Column 9: Tim., Timberlake (2002): 1, present; 0, absent.

APPENDIX 1.—A checklist of woody species at Catapú (cont.)

1 Taxon	2 Voucher No.	3 Growth form†	4 Sena name	5 Distr.	6 Gel.	7 DaS	8 Mul.	9 Tim.
Salvadoraceae								
<i>Salvadora persica</i> L. var. <i>persica</i>	M222	ST		T	0	NS	0	1
Sapindaceae								
<i>Allophylus rubifolius</i> (Hochst. ex A. Rich.) Engl.	JAW2; M67	ST	Nhamatubhu*	T	0	1	1	1
<i>Blighia unijugata</i> Baker	M66A	T		T	1	1	1	0
<i>Deinbollia xanthocarpa</i> (Klotzsch) Radlk.	Cher144	SG?	N'tsikiribhanda*	T	0	1	1	1
<i>Lecaniodiscus fraxinifolius</i> Baker subsp. <i>scassel-latii</i> (Chiov.) Friis	M128	T	Mutarara* N'talala*	T	0	1	0	1
Sapotaceae								
<i>Inhambanella henriquesii</i> (Engl. & Warb.) Dubard	Cher30, 148	T	M'piao*	T	1	1	1	0
<i>Manilkara mochisia</i> (Baker) Dubard	Cher147	T	N'gambu* N'gambu-n'gambu	T	0	1	0	1
<i>Mimusops obtusifolia</i> Lam.	Cher31, 149	T	N'salazi*	T	0	1	0	0
Solanaceae								
<i>Solanum aculeastrum</i> Dunal	Cher29	T		T	0	NM	0	0
Sterculiaceae								
<i>Cola mossambicensis</i> Wild	Cher150	T		E	0	1	0	0
<i>Dombeya rotundifolia</i> (Hochst.) Planch. var. <i>rotundifolia</i>	M97	T		T	1	1	0	1
<i>Dombeya shupangae</i> K. Schum.	Cher101	T		N	0	1	0	0
<i>Sterculia africana</i> (Lour.) Fiori var. <i>africana</i>	M133	T	N'ghoza*	N	0	1	0	1
<i>Sterculia appendiculata</i> K. Schum.	Cher151; M144	T	N'djale*	N	0	1	1	1
Strychnaceae								
<i>Strychnos henningsii</i> Gilg	Cher6, 28	T		T	1	1	0	0
<i>Strychnos madagascariensis</i> Poir.	Cher106	T	N'teme	T	2	NS	0	1
<i>Strychnos potatorum</i> L.f.	M82	T	N'tupa*	T	0	1	0	1
<i>Strychnos spinosa</i> Lam.	Cher104	T	N'tengulengu*	T	2	1	1	1
<i>Strychnos usambarensis</i> Gilg	Cher107; M129	T	N'tchapata	S	0	1	0	1
Thymelaeaceae								
<i>Synaptolepis alternifolia</i> Oliv.	M189	LS		N	0	NS	1	0
<i>Synaptolepis kirkii</i> Oliv.	Cher159; M190	L		T	0	NS	1	0
Tiliaceae								
<i>Glyphaea tomentosa</i> Mast.	Cher14	T	N'calangua* Ncalangue-ntherere*	E	0	1	0	0
<i>Grewia caffra</i> Meisn.	Cher7	SL		T	0	1	1	0

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APPENDIX 1.—A checklist of woody species at Catapú (cont.)

1	2	3	4	5	6	7	8	9
Taxon	Voucher No.	Growth form†	Sena name	Distr.	Gel.	DaS	Mul.	Tim.
Tiliaceae (cont.)								
<i>Grewia forbesii</i> Harv. ex Mast.	<i>Cher9</i>	ST	N'tsunzwa	N	0	NS	0	1
<i>Grewia inaequilatera</i> Garcke	<i>Cher8</i>	ST	Thenzua	T	0	1	0	1
<i>Grewia lepidopetala</i> Garcke	<i>Cher11</i>	ST	Nhacathenzua	N	0	NS	0	1
<i>Grewia micrantha</i> Bojer	<i>Cher109</i>	T	N'tongolo*	T	0	1	0	1
<i>Grewia microcarpa</i> K.Schum.	<i>Cher12, 13, 154</i>	T	N'tsunzwa	N	0	1	0	1
<i>Grewia sulcata</i> Mast.	<i>Cher102</i>	ST	N'tsunzwa*	T	0	1	1	1
Violaceae								
<i>Rinorea elliptica</i> (Oliv.) Kuntze	<i>Cher27, 32</i>	T		N	0	1	0	0
Vitaceae								
<i>Cissus cornifolia</i> (Baker) Planch.	<i>s.n.</i>	S		T	0	1	0	1
<i>Cissus integrifolia</i> (Baker) Planch.	<i>M107</i>	L	N'tamba*	T	0	1	1	1

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