

**LIST OF THE ULUGURU MOUNTAINS ENDEMIC
VASCULAR PLANTS**

BY

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EXECUTIVE SUMMARY

Compilation of plant list for Uluguru Mountains endemics has been carried out for the Uluguru Mountains Biodiversity Conservation Project (UMBCP), managed by the Wildlife Conservation Society of Tanzania (WCST) and supported by the Danish International Development Assistance (DANIDA). Other partners represented by UMBCP in this assignment are UMADEP, Morogoro Region Natural Resources Office and the Catchment Forestry Office of Morogoro Region. Dr. R.P.C. Temu and Dr. V.R. Nsolomo of the Sokoine University of Agriculture, produced the first report which will be sent to Dr. J. C. Lovett of the University of York, UK and Prof. T. Pócs of the Ezerhazy Teacher's College, Hungary for their contributions. Coordination between the four consultants and UMBCP, was facilitated by Dr. Neil Burgess, who is the UMBCP Technical Advisor (Appendix 1).

The work has been accomplished by making use of the Flora of Tropical East Africa and other published and unpublished data sources. Records were also checked in various herbaria in Tanzania.

Strict endemic and near-endemic species of the Uluguru Mountains are listed and their habits, habitats and altitudinal ranges indicated. It has been found that there are about 108 strict endemic species in the Uluguru Mountains. Most of the endemic species are shrubs followed by herbs, trees and lastly climbers. Most of the endemic species are confined to the families Rubiaceae (38 species in 11 genera), Orchidaceae (13 species in 7 genera) and Balsaminaceae (11 species in 1 genus).

The most preferred habitat by endemics is the montane rain forest. The major areas where the Uluguru endemics are concentrated are the forests of Bondwa/Lupanga, followed by Lukwangule/Chenzema and then Bunduki and Mgeta. These areas are therefore the major hotspots for endemism in the Uluguru Mountains.

About 89 Uluguru near-endemics were recorded. The species are known to occur in other areas of Tanzania, but mostly on the Eastern Arc Mountains, and including the Taita hills of Kenya. The near endemics are mostly in the families Rubiaceae (13 genera, 21 species), Orchidaceae (7 genera, 12 species) and Fabaceae (4 genera, 7 species).

The most common habits of the near-endemics were herbs, then trees, shrubs and lastly climbers. The species are found in diverse habitats, although about 40% of them are exclusively found in montane forests.

The study concludes that the Uluguru Mountains are rich in endemic taxa and hence should be protected for their biodiversity value, for the present and future generations. Various forms of degradation should be checked to avoid disappearance of most of the species, which occur in vulnerable habitats such as the over-exploited Mindu and Nguru ya Ndege hills. Human activities directly or indirectly leading to the destruction of forest vegetation need to be abandoned. This means, projects aimed at sensitising local communities to protect the biodiversity value of the Mountains and those aimed at improving their socio-economic life standards through land conservation, should be encouraged.

1.0 INTRODUCTION

The Uluguru Mountains form part of the Eastern Arc group of crystalline block-faulted Mountains of East Africa. Other Mountains in this group are the Taita hills of Kenya, and in Tanzania, the Pare, Usambara, Nguru, Rubeho (Usagara), Udzungwa and Mahenge (Lovett 1993). The formation of the Eastern arc Mountains resulted from faulting which was initiated during the Karoo period (290-180 Million years Before Present) and then reactivated to create the present Mountains during the last 7 million years BP (Griffiths 1993). The Mountains support about 2,000 plant species, 25-30% of which are endemic, with 16 genera being endemic or near endemic to the forests and forest edges of the Mountains (Lovett 1993). According to Rodgers (1994), the Eastern Arc Mountains are one of the six biodiversity hot spots of Tanzania, meaning that they have more than usual numbers of species, are centres of endemism and have a significant proportion of the world's population of species. Although the vegetation cover of these Mountains is less than 2% of Tanzania's land area, they harbour 30-40 % of the country's flora and fauna and have the second highest bird diversity on the African continent (Hipkiss 1997). The flora of the Mountains however, has affinities with forests to the west with the Guineo-Congolian region; to the south up to the Limpopo river; to the north with the horn of Africa and South west Ethiopia; and overseas with Madagascar and nearby islands, Far East and the Neotropics (Lovett 1993).

The Uluguru Mountains, as covered in this report, include all that area which encompasses forest reserves on the main range which are the North Uluguru (8,357 ha) and the South Uluguru (17,293 ha); and also include the nearby Kimboza on the lower eastern slopes (405 ha); Mindu (2285 ha) on the west; Nguru ya Ndege on the north-west, and Mkungwe (5045 ha) on the north-east. The exploration of flora in the Uluguru forests started before the last century and has proceeded in recent years (Pócs, 1988). Despite the fact that the exploration begun long time ago, it is thought that floristically, the forests have not been covered sufficiently and some species could still be undiscovered, and hence unknown to the present day (Pócs, 1988). The Uluguru Mountains have for a long time known to harbour a considerable number of endemic taxa. Currently, there is however, a danger of losing some of the endemic plant and animal species due to human activities in the Uluguru Mountains. Such threats, which should not be underestimated, are also common to other biodiversity hot spots in the country, including other Mountains of the

Eastern Arc (Nsolomo & Chamshama 1990, Maganga 1994, Nsolomo *et al.* 1997). The forest vegetation faces a number of problems including destruction by fire and due to the effects of increasing population pressure by communities living around the Mountains. The increasing population has resulted into unsustainable exploitation of the forests and poor cultivation methods such as shifting cultivation. Such activities culminate into accelerated soil erosion and land degradation, low crop productivity of the agricultural land promoting illegal annexing of forestland for habitation and cultivation (Nsolomo & Chamshama 1990).

Due to the importance of the Uluguru Mountains in terms of biodiversity conservation, endemism in plant species and ecosystem conservation in general, this report intends to put together a record of what is known about the floristic value of the Uluguru Mountains in terms of endemism, diversity of vascular plant species, and pinpoints the hot-spots of endemism on the Mountains. If not assembled, such information, which is usually scattered in various literature, herbaria records and other unpublished sources, is not easily accessible to give comprehensive picture of the value of the Mountains. It is anticipated that compilation of the information will contribute to the sustainable conservation and management of these important forests.

2.0 METHODOLOGY

Compilation of the lists of plants which are strict endemic and near-endemic to the Uluguru Mountains, have been accomplished by making use of the Flora of Tropical East Africa and other published and unpublished data sources. From the literature (see the list of references), information about various taxa distributed within and outside the Uluguru Mountains was collected. Information on some of the species recorded in literature, was ascertained from herbarium collections. The herbaria visited were the National Herbarium of Tanzania at the Tanzania Pesticide Research Institute (TPRI), Arusha, Tanzania Forestry Research Institute (TAFORI) herbarium at Lushoto, and the University of Dar-es-Salaam (UDSM). Dr J.C. Lovett and Prof. T. Pócs will add more information, by visiting appropriate herbaria in Europe, and from their personal field records.

3.0 RESULTS AND DISCUSSION

3.1 The Uluguru Mountains strict endemics

The lists of endemic species of the Uluguru Mountains are presented as Tables 1 & 2. There are about 108 endemic species in the Uluguru Mountains distributed in 31 families and 56 genera. The families having the highest number of endemic species in descending order are: Rubiaceae (38 species in 11 genera), Orchidaceae (13 species in 7 genera), Balsaminaceae (11 species in 1 genus), Fabaceae (5 species in 4 genera), Melastomataceae (5 species in 3 genera), Euphorbiaceae (3 species in 3 genera) and Lobeliaceae (3 species in 1 genus). The remaining families have less than 3 species or genera. The genera having the largest number of endemic species, in descending order in parentheses, are *Impatiens* (11), *Psychotria* (9), *Lasianthus* (7), *Pavetta* (6), *Stolzia* (5), *Grumilea* (4), *Chassalia* (3), *Gravesia* (3), *Lobelia* (3) and *Polystachya* (3). The remaining genera have less than 3 endemic species.

There is an additional list of 32 species reported in literature as Uluguru endemics (Table 3), but could not be ascertained due to unavailability of appropriate flora, and were not found in the herbaria visited. The most dominating families are Gesneriaceae (13 species in 3 genera) and Acanthaceae (10 species in 7 genera). When these species are ascertained, the total number species endemic to the Uluguru Mountains may be up to 140.

3.1.1 Distribution of the Uluguru strict endemics

The distribution of endemic species on the Uluguru Mountains is as shown in Table 1 and summarized as Fig. 1. They occur from altitudes as low as 200 m a.s.l. in Kimboza forest to as high as 2640 m a.s.l. on the Lukwangule peak of the Uluguru Mountains.

Bondwa/Lupanga forests harbour the highest number (34%) of endemic species of the Uluguru Mountains (Fig 1), followed by Lukwangule/Chenzema forests (23%) and the Bunduki/Mgeta area (16%). These areas are therefore the hot spots of vascular plant endemism on the Uluguru Mountains.

Table1. The Uluguru Strict Endemics and their Distribution

	Genus	Species	Distribution	Altitude
1	<i>Ophrypetalum</i>	1 <i>Ophrypetalum odoratum</i> ssp. <i>longipedicellatum</i>		
2	<i>Lefebvrea</i>	2 <i>Lefebvrea droopii</i> <i>Cryptotaenia calycina</i> var. <i>dissecta</i>	Lukwangule plateau	2300
3	<i>Ilex</i>	3 <i>Ilex mitis</i> var. <i>schliebenii</i>	Chenzema-Lukwangule; Lupanga; Bondwa	2400
4	<i>Arisaema</i>	4 <i>Arisaema ulugurensis</i>	Lukwangule; Mgeta river above Bunduki	2000-2400
5	<i>Cussonia</i>	5 <i>Cussonia lukwangulensis</i>	Tanana; Lukwangule Plateau	1380-2400
6	<i>Impatiens</i>	6 <i>Impatiens barbulata</i>	NW uluguru Mts above morning side	1610-1900
		7 <i>Impatiens ioides</i>	Bondwa-Lupanga; Mgeta valley	1200-2000
		8 <i>Impatiens lukwangulensis</i>	Bondwa; Lukwangule plateau	1650-2250
		9 <i>Impatiens pallide-rosea</i> var. <i>pallide-rosea</i>	Bunduki; Lukwangule plateau	1600-2500
		10 <i>Impatiens pseudohamata</i>	Lukwangule plateau above Chenzema	2250
		11 <i>Impatiens simbiniensis</i>	Bunduki; Simbini; Kihunza/Mkambaku Mt	1400-1500
		12 <i>Impatiens serpens</i>	Bondwa; Lukwangule; Kibungo-Mkambaku	1550-2350
		13 <i>Impatiens tricaudata</i>	Lukwangule plateau	2500-2650
		14 <i>Impatiens ulugurensis</i>	Bondwa; Lukwangule; Kibungo mission	1600-2550
		15 <i>Impatiens thamnoidea</i>	Lupanga	1800-2100
		16 <i>Impatiens humifusa</i>	Kinole	900-1300
7	<i>Ehretia</i>	17 <i>Ehretia rosea</i>	Tununguo	170-200
8	<i>Thylachium</i>	18 <i>Thylachium alboviolaceum</i>	Tununguo	200
		19 <i>Thylachium macrophyllum</i>	Vindili (Vinditi) East foothills of Uluguru mts	500
9	<i>Garcinia</i>	20 <i>Garcinia bifasciculata</i>	Kimboza FR	390
10	<i>Coccinia</i>	21 <i>Coccinia ulugurensis</i>	NW uluguru Mts	1350
11	<i>Phyllanthus</i>	22 <i>Phyllanthus thulinii</i>	Kitundu; Mkumbaku mt	1525-2000
12	<i>Necepsia</i>	23 <i>Necepsia castaneifolia</i> ssp. <i>kimbozensis</i>	Kimboza FR	300-350
13	<i>Zimmermannia</i>	24 <i>Zimmermannia acuminata</i>	Bondwa hill; Lupanga; above morningside	1350-1800
14	<i>Cynometra</i>	25 <i>Cynometra ulugurensis</i>	Kimboza FR	660
15	<i>Zenkerella</i>	26 <i>Zenkerella perplexa</i>	Bondwa hill	1350
16	<i>Baphia</i>	27 <i>Baphia pauloi</i>	Kimboza FR	400
17	<i>Crotalaria</i>	28 <i>Crotalaria inopinata</i>	N. Uluguru Reserve above morningside	1200-2000
		29 <i>Crotalaria hemsleyi</i>	Mgeta river above Bunduki	1200-1500
18	<i>Lobelia</i>	30 <i>Lobelia gilgii</i>	Lukwangule plateau; Lupanga	1520-2600

		31	<i>Lobelia graniticola</i>	Mkambaku Mt	2000-2600
		32	<i>Lobelia lukwangulensis</i>	Bondwa hill; Lukwangule plateau	1820-2500
19	<i>Adenopplusia</i>	33	<i>Adenopplusia ulugurensis</i>	NW Uluguru mts	1380
20	<i>Acridocarpus</i>	34	<i>Acridocarpus congestus</i>	Bondwa hill; above morning side	1350-1620
21	<i>Dionychastrum</i>	35	<i>Dionychastrum schliebenii</i>	Mkambaku mt, Magari peak above Mzinga	2340-2640
22	<i>Gravesia</i>	36	<i>Gravesia hylophila</i>	Nghwenn; Kinole; Tegetero	1000-1600
		37	<i>Gravesia pulchra</i> var. <i>pluchra</i>	NW Uluguru mts; Kitundu	1000-2000
		38	<i>Gravesia riparia</i>	? Uluguru Mts	1550
23	<i>Memecylon</i>	39	<i>Memecylon myrtilloides</i>	Bunduki-Salaza Forest; Lupanga peak	1350-2000
24	<i>Turraea</i>	40	<i>Turraea mombassana</i> ssp. <i>schliebenii</i>	? Uluguru Mts	1500
		41	<i>Turraea kimbozensis</i>	Kimboza F.R.	300-450
25	<i>Dorstenia</i>	42	<i>Dorstenia ulugurensis</i>	Nghweme; Matombo R.; Tanana; Lukwangule	1600-2000
		43	<i>Dorstenia dionga</i>	Mgeta R. below Hululu falls; S. Uluguru mts	1200-1800
26	<i>Jasminum</i>	44	<i>Jasminum rotundatum</i>	? Uluguru Mts	1000
27	<i>Olea</i>	45	<i>Olea schliebenii</i>	Lukwangule plateau; Lupanga	2460-2500
28	<i>Schrebera</i>	46	<i>Schrebera goetzeana</i>	? Uluguru Mts	1000
29	<i>Bulbophyllum</i>	47	<i>Bulbophyllum concatenatum</i>	Parata pass E ridge to Bondwa	1400-1900
30	<i>Diaphananthe</i>	48	<i>Diaphananthe orientalis</i>	Mesumba (Messumba)	1900
31	<i>Epipactis</i>	49	<i>Epipactis ulugurica</i>	N. Uluguru Magari peak; Mkambaku Mt	2150-2600
32	<i>Margelliantha</i>	50	<i>Margelliantha globularis</i>	? Uluguru Mts	1250
33	<i>Polystachya</i>	51	<i>Polystachya porphyrochila</i>	Mwere Valley	1450
		52	<i>Polystachya longiscapa</i>	Lupanga; morningside; Bunduki; Kitundu	1100-1600
		53	<i>Polystachya lukwangulensis</i>	Lukwangule plateau	2200
34	<i>Stolzia</i>	54	<i>Stolzia oligantha</i>	NW Uluguru Forest Reserve	1700-2000
		55	<i>Stolzia angustifolia</i>	NW Uluguru; Bondwa	1850-2000
		56	<i>Stolzia atrorubra</i>	NW Uluguru Parata pass; Bondwa; Lukwangule	1800-2400
		57	<i>Stolzia moniliformis</i>	Bondwa-Lupanga; Salaza F. South of Bunduki	1350-2000
		58	<i>Stolzia viridis</i>	Bondwa-Lupanga; Salaza F. South of Bunduki	1600-2000
35	<i>Tridactyle</i>	59	<i>Tridactyle sarcodantha</i>	? Uluguru Mts	1800
36	<i>Pittosporum</i>	60	<i>Pittosporum goetzei</i>	S. Uluguru FR.; Lukwangule plateau	2400
37	<i>Chassalia</i>	61	<i>Chassalia violacea</i> ssp. <i>parviflora</i>	Salaza FR-Bunduki; Tegetero	1100-2000
		62	<i>Chassalia violacea</i> ssp. <i>violacea</i>	Bondwa; Salaza FR, Bunduki	1200-2000
		63	<i>Chassalia</i> sp. <i>A</i>	Lukwangule plateau	2200
38	<i>Grumilea</i>	64	<i>Grumilea euchrysantha</i>	SE Uluguru, Kikurungu mt	1000

		65	<i>Grumilea chaunothyrsus</i>	SE Uluguru, Ng'hweme	1500
		66	<i>Grumilea blepharostipula</i>	SE Uluguru, Ng'hweme	1600
		67	<i>Grumilea pallidiflora</i>	Tununguo	300
39	<i>Lasianthus</i>	68	<i>Lasianthus cereiflorus</i>	NW Uluguru; Tegetero	1000-1700
		69	<i>Lasianthus glomeruliflorus</i>	Ng'hweme	1600
		70	<i>Lasianthus grandifolius</i>	Bondwa	2040
		71	<i>Lasianthus macrocalyx</i>	Bondwa; Lukwangule plateau	1800-2430
		72	<i>Lasianthus microcalyx</i>	Bondwa; Lukwangule plateau	2100-2430
		73	<i>Lasianthus wallacei</i>	Bondwa; Lukwangule plateau; Kinolo road	1680-1900
		74	<i>Lasianthus xanthospermus</i>	Lukwangule plateau	2400
40	<i>Pavetta</i>	75	<i>Pavetta bruceana</i>	Lukwangule plateau	2040-2400
		76	<i>Pavetta constipulata var. constipulata</i>	Bondwa-Lupanga	1370-1740
		77	<i>Pavetta constipulata var. uranoscopa</i>	? Uluguru Mts	900-1100
		78	<i>Pavetta filistipulata</i>	Tegetero; Morningside	1100-1500
		79	<i>Pavetta crebifolia var. kimbozensis</i>	Kimboza F.R.	400-460
		80	<i>Pavetta sparsipila</i>	NW Uluguru; Bondwa; Bunduki	1200-1500
41	<i>Pentas</i>	81	<i>Pentas ionolaena</i>	Above morningside; Chenzema-Lukwangule	1200-2200
		82	<i>Pentas pseudomagnifica</i>	Lukwangule plateau	2060-3000
		83	<i>Pentas ulugurica</i>	Bondwa; Tegetero	1000-1800
42	<i>Pseudonesohedyotis</i>		<i>Pseudonesohedyotis bremekampii</i>	Lukwangule plateau; Mkambaku Mt	1370-2650
43	<i>Pseudosabicea</i>	85	<i>Pseudosabicea arborea ssp. arborea</i>	Bunduki; Lupanga; Ngluwenu	1650-2106
44	<i>Psychotria</i>	86	<i>Psychotria brucei</i>	Salaza FR-Bunduki; Lukwangule; Tanana	1700-2400
		87	<i>Psychotria castaneifolia</i>	? Uluguru Mts; Nguru ya ndege hill	1200-1300
		88	<i>Psychotria cephalidantha</i>	? Uluguru Mts	?
		89	<i>Psychotria elachistantha</i>	Bondwa above morningside	1350-1950
		90	<i>Psychotria megistantha</i>	Lukwangule; Kimbinyuko (Bunduki)	1500-2500
		91	<i>Psychotria schliebenii var. sessilipaniculata</i>	Tanana	0-1350
		92	<i>Psychotria tanganyicensis ssp. longipes</i>	Tegetero	1800
		93	<i>Psychotria sp. D</i>	Lukwangule	2300-2406
		94	<i>Psychotria sp. I</i>	Bondwa hill	1500
45	<i>Rhipidantha</i>	95	<i>Rhipidantha chlorantha</i>	Mwere Valley; Bondwa; Bunduki	1450-1740
46	<i>Rytigynia</i>	96	<i>Rytigynia lichenoxenos ssp. lichenoxenos</i>	Lukwangule	1830-2400
		97	<i>Rytigynia nodulosa</i>	Nglewenu; Lupanga	1350-2100
47	<i>Tarenna</i>	98	<i>Tarenna quadrangularis</i>	Kisaki road; Mwere valley; above morningside	1350-1650

48	<i>Vepris</i>	99	<i>Vepris mildbraediana</i>	NW Uluguru	1860
49	<i>Mimusops</i>	100	<i>Mimusops penduliflora</i>	Mbakana (Mbakano) river	600
50	<i>Solanum</i>	101	<i>Solanum schliebenii</i>	Bunduki FR	?
51	<i>Ternstroemia</i>	102	<i>Ternstroemia polypetala</i>	NW Uluguru-Lupanga; Lukwangule plateau	1800-2300
52	<i>Peddiea</i>	103	<i>Peddiea puberula</i>	NW Uluguru mts; S. Uluguru Lukwangule	1300-2200
53	<i>Stapfiella</i>	104	<i>Stapfiella ulugurica</i>	Lupanga peak; Tanana Matombo road	1900-2100
54	<i>Pilea</i>	105	<i>Pilea goetzei</i>	Lukwangule; Mkambaku mt; SE slope Tumbako	1300-2050
55	<i>Clerodendrum</i>	106	<i>Clerodendrum suffruticosum</i>	Magado; Nyandiduma FR	690-1800
56	<i>Cyphostemma</i>	107	<i>Cyphostemma masukuense</i> var. <i>ulugurense</i>	Lukwangule above Chenzema; Salaza FR	2000-2400
		108	<i>Cyphostemma gracillimum</i>	Mindu Hill; Nguru ya Ndege Hill	600-1200

Table 2. The Habit and Habitats of the Uluguru mountains Endemics

Family	Genus	Species	Habit	Habitat
Annonaceae	1 <i>Ophrypetalum</i>	1 <i>Ophrypetalum odoratum</i> ssp. <i>longipedicellatum</i>		
Apiaceae	2 <i>Lefebvrea</i>	2 <i>Lefebvrea calycina</i> var. <i>dissecta</i>	Herb	Montane forest on open and rocky places
Aquifoliaceae	3 <i>Ilex</i>	3 <i>Ilex mitis</i> var. <i>schliebenii</i>	Tree	Montane rain forest
Araceae	4 <i>Arisaema</i>	4 <i>Arisaema ulugurensis</i>	Herb	Montane bushland and forest
Araliaceae	5 <i>Cussonia</i>	5 <i>Cussonia lukwangulensis</i>	Tree	Montane rain forest on steep slopes
Balsaminaceae	6 <i>Impatiens</i>	6 <i>Impatiens barbulata</i>	Herb	Montane rain forest in shade
		7 <i>Impatiens ioides</i>	Herb	Montane rain forest and riverine rocks
		8 <i>Impatiens lukwangulensis</i>	Herb	Montane rain forest in moist and shaded areas
		9 <i>Impatiens pallide-rosea</i> var. <i>pallide-rosea</i>	Herb	Montane rain forest and cleared areas
		10 <i>Impatiens pseudohamata</i>	Herb	Montane rain forest in moist and open areas
		11 <i>Impatiens simbiniensis</i>	Herb	Montane rain forest
		12 <i>Impatiens serpens</i>	Herb	Montane rain forest, among mosses and shaded areas
		13 <i>Impatiens tricaudata</i>	Herb	Montane rain forest
		14 <i>Impatiens ulugurensis</i>	Herb	Montane rain forest, among mosses and shaded areas
		15 <i>Impatiens thamnoidea</i>	Herb	Montane rain forest and shaded areas
		16 <i>Impatiens humifusa</i>	Herb	Montane rain forest on rocks
Boraginaceae	7 <i>Ehretia</i>	17 <i>Ehretia rosea</i>	Shrub	Forest
Capparaceae	8 <i>Thylachium</i>	18 <i>Thylachium alboviolaceum</i>	Shrub	?
		19 <i>Thylachium macrophyllum</i>	Shrub	Deciduous woodland
Clusiaceae	9 <i>Garcinia</i>	20 <i>Garcinia bifasciculata</i>	Tree	Swamp forest on limestone outcrops
Cucurbitaceae	10 <i>Coccinia</i>	21 <i>Coccinia ulugurensis</i>	Climber	Forest edge
Euphorbiaceae	11 <i>Phyllanthus</i>	22 <i>Phyllanthus thulinii</i>	Shrub	Steep rocky slope with <i>Hypericum</i> and <i>Philippia</i>
	12 <i>Necepsia</i>	23 <i>Necepsia castaneifolia</i> ssp. <i>kimbozensis</i>	Tree	Lowland rain forest on dolomite marble
	13 <i>Zimmermannia</i>	24 <i>Zimmermannia acuminata</i>	Shrub	Montane rain forest
Fabaceae	14 <i>Cynometra</i>	25 <i>Cynometra ulugurensis</i>	Tree	Lowland rain forest
	15 <i>Zenkerella</i>	26 <i>Zenkerella perplexa</i>	Tree	Montane rain forest
	16 <i>Baphia</i>	27 <i>Baphia pauloi</i>	Tree	?

	17	<i>Crotalaria</i>	28	<i>Crotalaria inopinata</i>	Shrub	Montane forest on open and rocky places
			29	<i>Crotalaria hemsleyi</i>	Shrub	Upland secondary bushland and grassland; riverine
Lobeliaceae	18	<i>Lobelia</i>	30	<i>Lobelia gilgii</i>	Herb	Rocky and shallow soils and along streams
			31	<i>Lobelia graniticola</i>	Herb	Rocky and shallow soils
			32	<i>Lobelia lukwangulensis</i>	Shrub	Montane forest and forest edges
Loganiaceae	19	<i>Adenoplusia</i>	33	<i>Adenoplusia ulugurensis</i>	Shrub	Montane forest in open places
Malpighiaceae	20	<i>Acridocarpus</i>	34	<i>Acridocarpus congestus</i>	Climber	Rain forest
Melastomataceae		<i>Dionychastrum</i>	35	<i>Dionychastrum schliebenii</i>	Shrub	Montane rain forest
	22	<i>Gravesia</i>	36	<i>Gravesia hylophila</i>	Herb	Montane rain forest and evergreen bushland
			37	<i>Gravesia pulchra</i> var. <i>pluchra</i>	Herb	Montane rain forest
			38	<i>Gravesia riparia</i>	Herb	Montane rain forest and riverine forest
	23	<i>Memecylon</i>	39	<i>Memecylon myrtilloides</i>	Shrub	Montane rain forest
Meliaceae	24	<i>Turraea</i>	40	<i>Turraea mombassana</i> ssp. <i>schliebenii</i>	Shrub	Montane rain forest
			41	<i>Turraea kimbozensis</i>	Shrub	Lowland forest on lime outcrops
Moraceae	25	<i>Dorstenia</i>	42	<i>Dorstenia ulugurensis</i>	Herb	Moist forest under shade
			43	<i>Dorstenia dionga</i>	Herb	Moist forest under shade
Oleaceae	26	<i>Jasminum</i>	44	<i>Jasminum rotundatum</i>	Climber	Montane dry evergreen forest
	27	<i>Olea</i>	45	<i>Olea schliebenii</i>	Tree	Montane dry evergreen forest
	28	<i>Schrebera</i>	46	<i>Schrebera goetzeana</i>	Shrub	?
Orchidaceae	29	<i>Bulbophyllum</i>	47	<i>Bulbophyllum concatenatum</i>	Herb	Montane rain forest
	30	<i>Diaphananthe</i>	48	<i>Diaphananthe orientalis</i>	Epiphytic Herb	Epiphytic in moist montane forest
	31	<i>Epipactis</i>	49	<i>Epipactis ulugurica</i>	Herb	Subalpine bushland and moist forest
	32	<i>Margelliantha</i>	50	<i>Margelliantha globularis</i>	Epiphytic Herb	Epiphytic in moist montane forest
	33	<i>Polystachya</i>	51	<i>Polystachya porphyrochila</i>	Herb	Montane rain forest
			52	<i>Polystachya longiscapa</i>	Herb	Rocks
			53	<i>Polystachya lukwangulensis</i>	Herb	Montane rain forest
	34	<i>Stolzia</i>	54	<i>Stolzia oligantha</i>	Epiphytic Herb	Epiphytic on mossy branches in mist forest
			55	<i>Stolzia angustifolia</i>	Epiphytic Herb	Epiphytic among mosses, lichens on small branches
			56	<i>Stolzia atrorubra</i>	Herb	Mossy branches and rocks in mist forest
			57	<i>Stolzia moniliformis</i>	Epiphytic Herb	Epiphytic/lithophytic among mosses in montane forest
			58	<i>Stolzia viridis</i>	Herb	Mossy branches in wet mist forest
	35	<i>Tridactyle</i>	59	<i>Tridactyle sarcodantha</i>	Epiphytic Herb	Montane forest

Pittosporaceae	36	<i>Pittosporum</i>	60	<i>Pittosporum goetzei</i>	Tree	Montane forest above Bamboo belt
Rubiaceae	37	<i>Chassalia</i>	61	<i>Chassalia violacea</i> ssp. <i>parviflora</i>	Shrub	Montane rain forest
			62	<i>Chassalia violacea</i> ssp. <i>violacea</i>	Shrub	Montane rain forest
			63	<i>Chassalia</i> sp. <i>A</i>	Shrub	Montane rain forest
	38	<i>Grumilea</i>	64	<i>Grumilea euchrysantha</i>	Shrub	Montane rain forest
			65	<i>Grumilea chaunothyrsus</i>	Shrub	Montane rain forest
			66	<i>Grumilea blepharostipula</i>	Shrub	Montane rain forest
			67	<i>Grumilea pallidiflora</i>	Shrub	Foothills
	39	<i>Lasianthus</i>	68	<i>Lasianthus cereiflorus</i>	Shrub	Montane rain forest shrub layer
			69	<i>Lasianthus glomeruliflorus</i>	Shrub	Montane rain forest shrub layer
			70	<i>Lasianthus grandifolius</i>	Shrub	Montane rain forest shrub layer
			71	<i>Lasianthus macrocalyx</i>	Shrub	Montane rain forest shrub layer
			72	<i>Lasianthus microcalyx</i>	Shrub	Montane rain forest shrub layer
			73	<i>Lasianthus wallacei</i>	Shrub	Montane rain forest shrub layer
			74	<i>Lasianthus xanthospermus</i>	Shrub	Montane rain forest shrub layer
	40	<i>Pavetta</i>	75	<i>Pavetta bruceana</i>	Shrub	Forest
			76	<i>Pavetta constipulata</i> var. <i>constipulata</i>	Shrub	Forest
			77	<i>Pavetta constipulata</i> var. <i>uranoscopa</i>	Shrub	Forest
			78	<i>Pavetta filistipulata</i>	Shrub	Forest shrub layer
			79	<i>Pavetta crebifolia</i> var. <i>kimbozensis</i>	Shrub	Lowland forest on lime outcrops
			80	<i>Pavetta sparsipila</i>	Shrub	Forest
	41	<i>Pentas</i>	81	<i>Pentas ionolaena</i>	Herb	Moist and dry evergreen forest
			82	<i>Pentas pseudomagnifica</i>	Shrub	Grassland, scrub, montane forest on rocky places
			83	<i>Pentas ulgurica</i>	Herb	Ground layer of rain forest
	42	<i>Pseudonesohedyotis</i>	84	<i>Pseudonesohedyotis bremekampii</i>	Shrub	Montane rain forest
	43	<i>Pseudosabicea</i>	85	<i>Pseudosabicea arborea</i> ssp. <i>arborea</i>	Shrub	Evergreen forest
	44	<i>Psychotria</i>	86	<i>Psychotria brucei</i>	Shrub	Montane rain forest
			87	<i>Psychotria castaneifolia</i>	Shrub	Montane rain forest
			88	<i>Psychotria cephalidantha</i>	Shrub	Montane rain forest
			89	<i>Psychotria elachistantha</i>	Tree	Montane rain forest
			90	<i>Psychotria megistantha</i>	Tree	Montane rain forest
			91	<i>Psychotria schliebenii</i> var. <i>sessilipaniculata</i>	Shrub	Evergreen forest

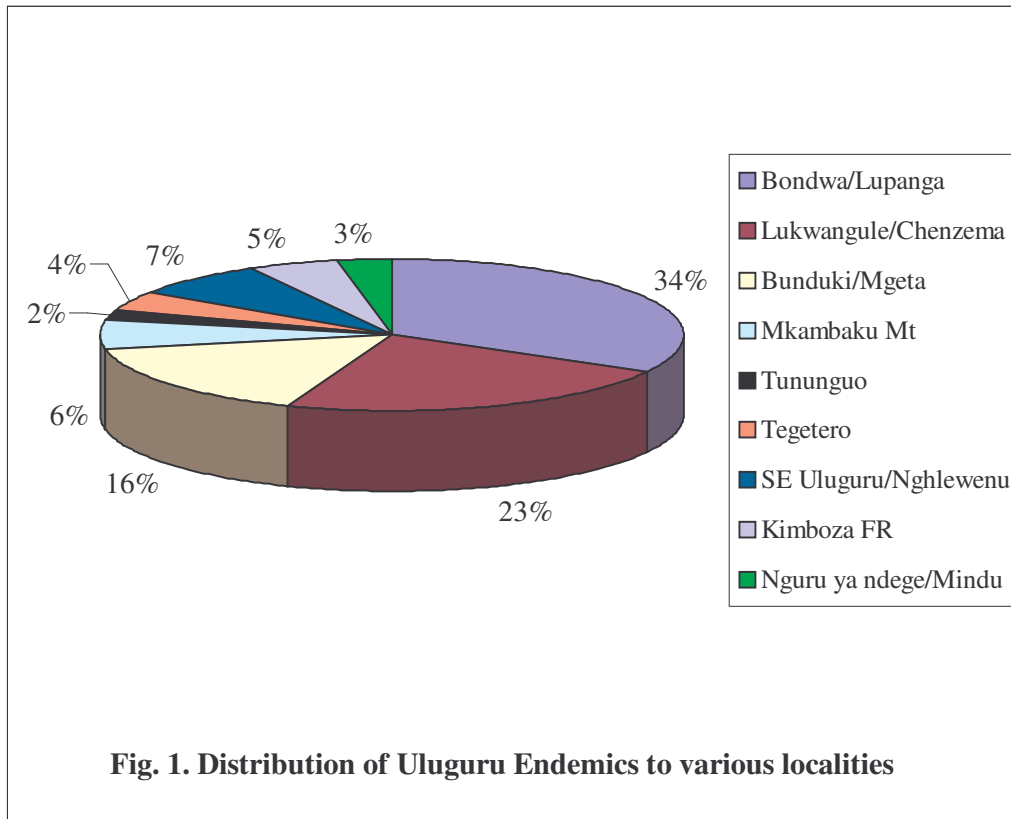
		92	<i>Psychotria tanganyicensis ssp longipes</i>	Shrub	Montane rain forest
		93	<i>Psychotria sp. D</i>	Shrub	Montane rain forest
		94	<i>Psychotria sp. I</i>	Tree	Riverine forest
	45	95	<i>Rhipidantha chlorantha</i>	Tree	Evergreen forest
	46	96	<i>Rytigynia lichenoxenos ssp lichenoxenos</i>	Tree	Montane rain forest
		97	<i>Rytigynia nodulosa</i>	Shrub	Mist montane forest
	47	98	<i>Tarenna quadrangularis</i>	Shrub	Forest
Rutaceae	48	99	<i>Vepris mildbraediana</i>	Shrub	Montane rain forest
Sapotaceae	49	100	<i>Mimusops penduliflora</i>	Tree	Riverine forest
Solanaceae	50	101	<i>Solanum schliebenii</i>	Shrub	Forest
Theaceae	51	102	<i>Ternstroemia polypetala</i>	Tree	Montane rain forest
Thymelaeaceae	52	103	<i>Peddiea puberula</i>	Tree	Montane rain forest
Turneraceae	53	104	<i>Stapfiella ulugurica</i>	Shrub	Montane rain forest
Urticaceae	54	105	<i>Pilea goetzei</i>	Herb	Montane rain forest on moist rocks and along streams
Verbenaceae	55	106	<i>Clerodendrum suffruticosum</i>	Shrub	Grassland in forest glades
Vitaceae	56	107	<i>Cyphostemma masukuense var. ulugurense</i>	Climber	Rain forest; open areas in bushlands; forest edges
		108	<i>Cyphostemma gracillimum</i>	Climber	Grassy Brachystegia woodlands, rocky ridge

Table 3. Other Uluguru endemics reported in literature *

Family		Genus		Species
Acanthaceae	1	<i>Barleria</i>	1	<i>Barleria lukwangulensis</i>
	2	<i>Epiclastopelma</i>	2	<i>Epiclastopelma glandulosum</i>
			3	<i>Epiclastopelma macranthum</i>
	3	<i>Isoglosa</i>	4	<i>Isoglosa ixodes</i>
			5	<i>Isoglosa oreacanthoides</i>
	4	<i>Justicia</i>	6	<i>Justicia beloperonoides</i>
			7	<i>Justicia ulugurica</i>
	5	<i>Mimulopsis</i>	8	<i>Mimulopsis longisepala</i>
	6	<i>Schliebenia</i>	9	<i>Schliebenia salviiflora</i>
	7	<i>Thamnojusticia</i>	10	<i>Thamnojusticia grandiflora</i>
Asteraceae	8	<i>Vernonia</i>	11	<i>Vernonia ulugurensis</i>
Gentianaceae	9	<i>Urogentias</i>	12	<i>Urogentias ulugurensis</i>
Gesneriaceae	10	<i>Linnaeopsis</i>	13	<i>Linnaeopsis alba</i>
			14	<i>Linnaeopsis heckmanniana</i>
			15	<i>Linnaeopsis subscandens</i>
	11	<i>Saintpaulia</i>	16	<i>Saintpaulia brevipilosa</i>
			17	<i>Saintpaulia goetzeana</i>
			18	<i>Saintpaulia incospicua</i>
			19	<i>Saintpaulia pusilla</i>
	12	<i>Streptocarpus</i>	20	<i>Streptocarpus bullatus</i>
			21	<i>Streptocarpus euanthus</i>
			22	<i>Streptocarpus hirsutissimus</i>
			23	<i>Streptocarpus kimbozanus</i>

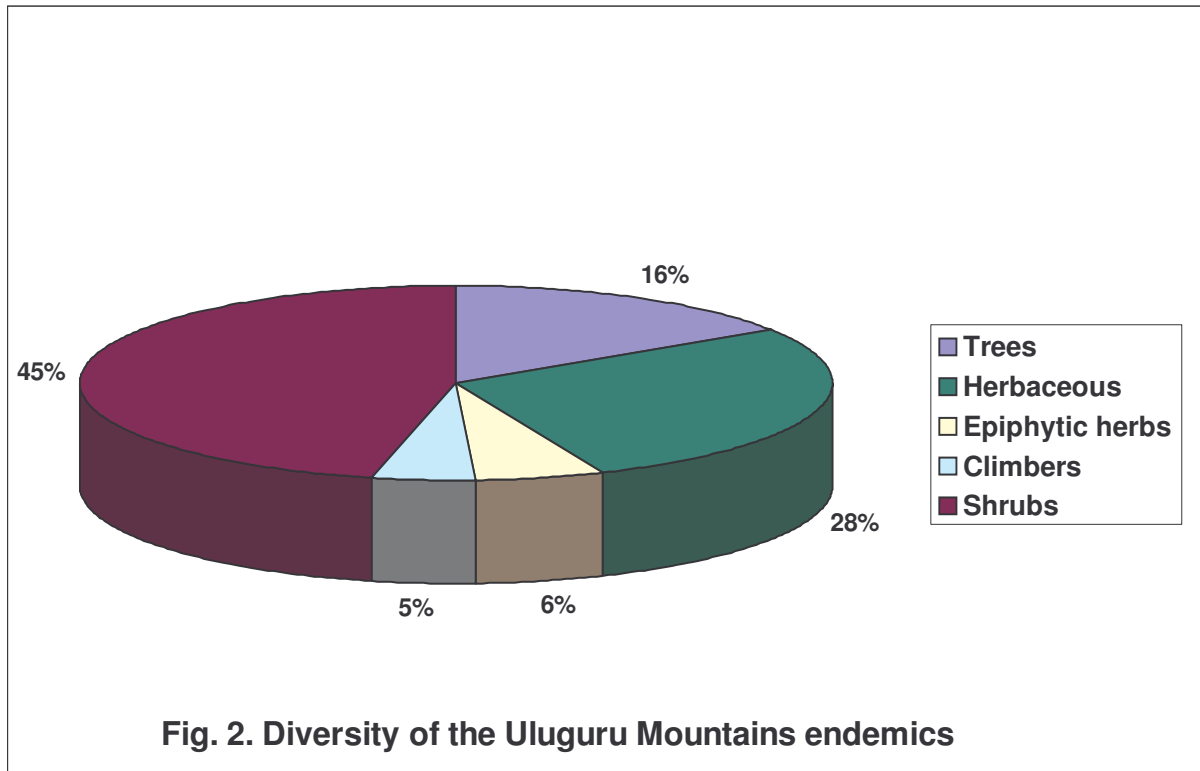
			24	<i>Streptocarpus tchenzema</i>
			25	<i>Streptocarpus thysanotus</i>
Myrtaceae	13	<i>Syzygium</i>	26	<i>Syzygium parvulum</i>
Solanaceae	14	<i>Solanum</i>	27	<i>Solanum inaequiradians</i>
			28	<i>Solanum lignosum</i>
Sterculiaceae	15	<i>Cola</i>	29	<i>Cola microcarpa</i>
			30	<i>Cola stelecantha</i>
	16	<i>Dombeya</i>	31	<i>Dombeya macrotis</i>
			32	<i>Dombeya sisyrocarpa</i>

* = Species reported to be endemic but could not be ascertained due to unavailability of appropriate Flora and also could not be found in the herbaria visited.



3.1.2 Habits and habitats of the Uluguru Mountains strict endemics

The habits and habitats of the Uluguru endemics are presented in Table 2. The most dominant life forms in descending order are shrubs, herbs, trees, epiphytic herbs and climbers (Fig. 2). Of the 108 endemic species recorded, 50 are shrubs, 30 are herbs, 17 are trees, 6 are epiphytic herbs and 5 are climbers. It is important to note that about 70% of the Uluguru endemics are found in montane rain forests.



3.2 The Uluguru Mountains near endemics

There are about 89 near endemic species of the Uluguru Mountains belonging to 32 families and 67 genera (Table 4). The most dominant families are Rubiaceae (13 genera, 21 species), Orchidaceae (7 genera, 12 species), Fabaceae (4 genera, 7 species), Melastomataceae (4 genera, 4 species), Acanthaceae (3 genera, 3 species) and Euphorbiaceae (3 genera, 3 species). The remaining families have less than 3 genera and not more than 3 species. The genera having the largest number of near-endemic species, in descending order in parentheses, are *Psychotria* (6), *Polystachya* (5), *Tricalysia* (4), *Impatiens* (3) and *Milletia* (3). The remaining genera have less than 3 near-endemic species.

Table 4. Uluguru Mountains Near Endemics and their Distribution

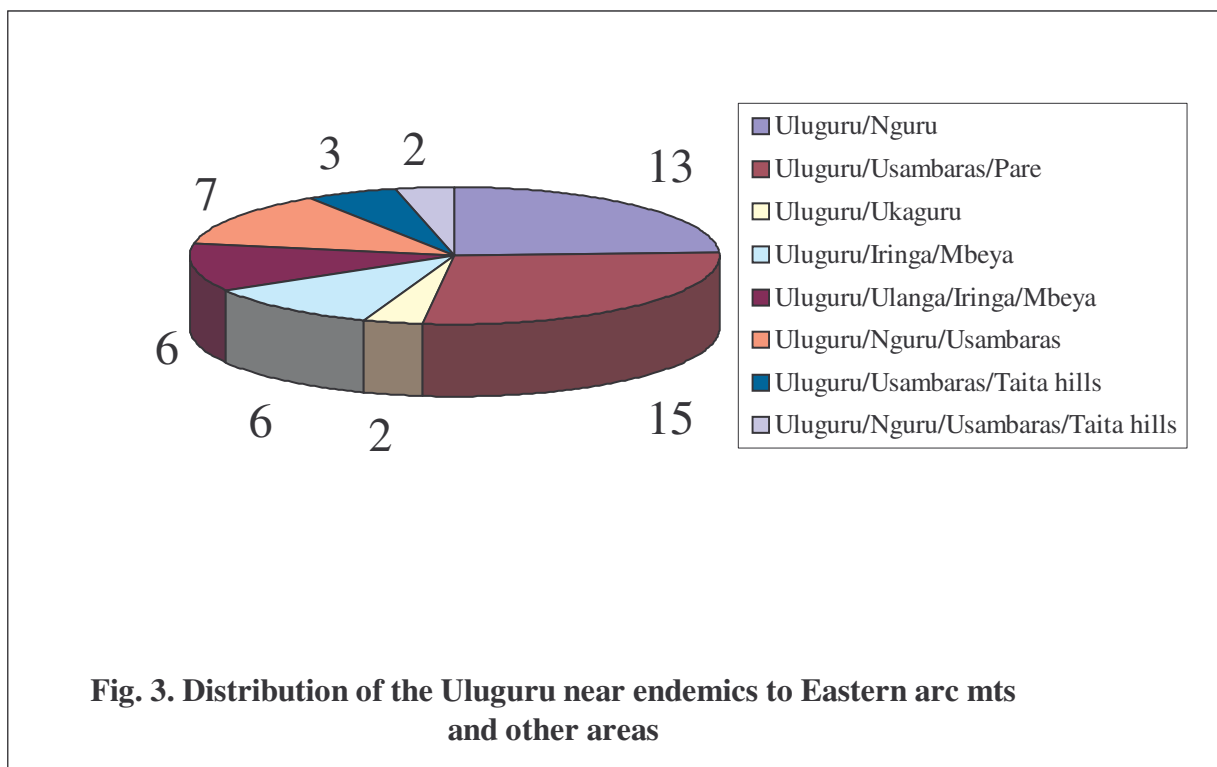
Family	Genus	Species	Distribution in the Ulugurus	Where else found
Acanthaceae	1 <i>Brillantaisia</i>	1 <i>Brillantaisia ulugurica</i>	Mgeta R. (Bunduki); Morningside	Mwanihana FR; Mufindi, Iringa (T7)
	2 <i>Isoglosa</i>	2 <i>Isoglosa lactea</i>	Ng'ubalale; Uluguru F.R., Palu	Nguru; Usambaras (T3)
	3 <i>Justicia</i>	3 <i>Justicia interrupta</i>	Ng'ubalale; Uluguru F.R.	Nguru mts & Mwanihana (T6), Usambaras (T3)
Aloeaceae	4 <i>Aloe</i>	4 <i>Aloe bussei</i>	? Nguru ya ndege	Kilosa (T5); Iringa (T7)
Amaryllidaceae	5 <i>Crinum</i>	5 <i>Crinum politifolium</i>	? Uluguru mts	Usambaras (T3); Iringa (T7)
Annonaceae	6 <i>Uvari dendron</i>	6 <i>Uvari dendron gorgonis</i>	Kimboza F.R.	Nguru mts (T6)
Apiaceae	7 <i>Lefebvrea</i>	7 <i>Lefebvrea droopii</i>	Kunyema; Lukwangule; Lupanga	Nguru mts (T6)
	8 <i>Cryptotaenia</i>	8 <i>Cryptotaenia calycina</i> var. <i>calycina</i>	? Uluguru NW side	Nguru mts (T6)
		9 <i>Cryptotaenia polygama</i>	Morningside; Tanana	Pare mts (T3)
Araceae	9 <i>Amorphophalus</i>	10 <i>Amorphophalus stuhlmannii</i>	Kimboza F.R.	Ulanga (T6); Usambaras (T3)
Araliaceae	10 <i>Polyscias</i>	11 <i>Polyscias stuhlmannii</i> var. <i>stuhlmannii</i>	Lupanga	Usambaras (T3), K7
Balsaminaceae	11 <i>Impatiens</i>	12 <i>Impatiens kentrodonta</i>	Bondwa; Salaza forest	Ukaguru mts (T5)
		13 <i>Impatiens pallide-rosea</i> var. <i>lupangensis</i>	Bondwa; Lupanga	Ukaguru mts (T5)
		14 <i>Impatiens hamata</i>	Bondwa; Lupanga	Nguru mts (T6)
Boraginaceae	12 <i>Tournefortia</i>	15 <i>Tournefortia usambarensis</i>	Tanana	Usambaras (T3)
Clusiaceae	13 <i>Allanblackia</i>	16 <i>Allanblackia ulugurensis</i>	Morningside; Lupanga	Nguru mts (T6), Iringa (T7)
		17 <i>Allanblackia stuhlmannii</i>	Mngazi river	Usambaras (T3); T7
	14 <i>Garcinia</i>	18 <i>Garcinia semseii</i>	Kimboza F.R.	Nguru mts (T6)
Convolvulaceae	15 <i>Stictocardia</i>	19 <i>Stictocardia lutambensis</i>	? Uluguru mts	Lindi (T8)
Crassulaceae	16 <i>Kalanchoe</i>	20 <i>Kalanchoe obtusa</i>	Kimboza F.R.	Usambaras (T3); Taita hills (K7)
Dichapetalaceae	17 <i>Dichapetalum</i>	21 <i>Dichapetalum eickii</i>	Bondwa	Usambaras (T3); Taita hills (K7)
Dioscoreaceae	18 <i>Dioscorea</i>	22 <i>Dioscorea longicuspis</i>	Bondwa	Usambaras (T3)
Euphorbiaceae	19 <i>Erythrococca</i>	23 <i>Erythrococca uluguruensis</i>	Bondwa	Iringa (T7); Kilwa (T8)
	20 <i>Euphorbia</i>	24 <i>Euphorbia quadrialata</i>	Kimboza F.R.	Pare, Handeni, Lushoto (T3)
	21 <i>Suregada</i>	25 <i>Suregada lithoxyla</i>	Kimboza F.R.	Usambaras (T3)
Fabaceae	22 <i>Zenkerella</i>	26 <i>Zenkerella egregia</i>	Kimboza F.R.	Nguru mts; Malundwe (T6); Usambaras (T3)
		27 <i>Zenkerella capparidacea</i> ssp. <i>capparidacea</i>	Mwere; Lupanga	Nguru mts (T6)
	23 <i>Milletia</i>	28 <i>Milletia sericantha</i>	Mgasi river	Nguru mts (T6)

		29	<i>Milletia elongatistyla</i>	Kimboza F.R.	Ulanga (T6)	
		30	<i>Milletia oblata ssp. intermedia</i>	NW Uluguru, Bunduki	Usambaras (T3); Njombe (T7)	
	24	31	<i>Crotalaria lukwangulensis</i>	Lukwangule plateau	Usambaras (T3); Iringa (T7); Taita hills (K7)	
	25	32	<i>Isoberlinia</i>	Kimboza F.R.	Nguru mts (T6); Usambaras (T3)	
Hamamelidaceae	26	33	<i>Trichocladus</i>	<i>Trichocladus goetzei</i>	S. Uluguru Forest; Lukwangule	Iringa, Rungwe (T7)
Icacinaceae	27	34	<i>Alsodeiopsis</i>	<i>Alsodeiopsis schumannii</i>	Bondwa	Usambaras (T3)
Iridaceae	28	35	<i>Gladiolus</i>	<i>Gladiolus rupicola</i>	NW Uluguru F.R.	Usambaras (T3); Taita (K7); Iringa (T7)
	29	36	<i>Moraea</i>	<i>Moraea callista</i>	Msumbisi (Mzumbi)	Kitulo plateau; Mtorwi mt.
Lobeliaceae	30	37	<i>Lobelia</i>	<i>Lobelia longisepala</i>	? Uluguru Eastern side	Ulanga (T6); Usambaras (T3)
Melastomataceae	31	38	<i>Dissotis</i>	<i>Dissotis polyantha</i>	Morningside; Lupanga	Iringa (T7)
	32	39	<i>Gravesia</i>	<i>Gravesia pulchra var. glandulosa</i>	Bondwa; Tanana	Nguru mts (T6)
	33	40	<i>Medinilla</i>	<i>Medinilla engleri</i>	Lupanga	Usambaras (T3)
	34	41	<i>Memecylon</i>	<i>Memecylon cogniauxii</i>	Tegetero	Usambaras (T3)
Montiniaceae	35	42	<i>Grevea</i>	<i>Grevea eggelingii ssp. eggelingii</i>	Magandu; Morogoro river	Mtibwa (T6); Handeni (T3)
Moraceae	36	43	<i>Dorstenia</i>	<i>Dorstenia goetzei</i>	Lukwangule plateau	Usambaras (T3); Ulanga (T6); Taita (K7)
		44	<i>Dorstenia hildebrandtii var. hildebrandtii</i>	Kimboza F.R.	Usambaras (T3); K1	
Orchidaceae	37	45	<i>Ancistrorhynchus</i>	<i>Ancistrorhynchus laxiflorus</i>	Mindu hill	Ulanga (T6); Iringa (T7)
	38	46	<i>Bulbophyllum</i>	<i>Bulbophyllum gilgianum</i>	Lupanga	Udzungwa mts (T7)
	39	47	<i>Diaphananthe</i>	<i>Diaphananthe meliantha</i>	Lukwangule plateau	Iringa; Rungwe (T7)
	40	48	<i>Margelliantha</i>	<i>Margelliantha leedalii</i>	Bondwa; Lupanga	Taita hills (K7); Iringa (T7)
	41	49	<i>Neobenthamia</i>	<i>Neobenthamia gracilis</i>	Lupanga	Nguru mts (T6); Handeni (T3)
	42	50	<i>Polystachya</i>	<i>Polystachya caespitifica ssp. caespitifica</i>	Bondwa; Mwere valley	Usambaras (T3)
		51	<i>Polystachya isochiloides</i>	Mindu hill	Mt Nyogi Handeni (T3); Usambaras (T3)	
		52	<i>Polystachya melanantha</i>	Bondwa	Nguru mts (T6); Mozambique?	
		53	<i>Polystachya subdiphylla</i>	Bunduki	Nguru mts (T6)	
		54	<i>Polystachya ulugurensis</i>	Bondwa; Maunga valley	Ulanga (T6); Iringa (T7))	
	43	55	<i>Tridactyle</i>	<i>Tridactyle brevifolia</i>	Bondwa	Nguru mts (T6)
		56	<i>Tridactyle phaeocephala</i>	Lukwangule plateau; Bondwa	Pare mts (T3)	
Oxalidaceae	44	57	<i>Biophytum</i>	<i>Biophytum turianense</i>	Mkungwe hil	Nguru mts (T6)
Rhizophoraceae	45	58	<i>Cassipourea</i>	<i>Cassipourea rotundifolia</i>	Lukwangule plateau	Iringa (T7), K4
Rubiaceae	46	59	<i>Ancylanthos</i>	<i>Ancylanthos rufescens ssp rufescens</i>	Tanana	Nguru mts (T6)

	47	<i>Bertiera</i>	60	<i>Bertiera pauloi</i>	? Uluguru mts	Ulanga (T6); Iringa (T7))
	48	<i>Chassalia</i>	61	<i>Chassalia discolor ssp. discolor</i>	Kitundu	Nguru mts (T6); Usambaras (T3)
	49	<i>Danais</i>	62	<i>Danais xanthorrhoea</i>	Hululu falls; Mgeta river	Usambaras
	50	<i>Ixora</i>	63	<i>Ixora tanzaniensis</i>	Kimboza F.R.	Ulanga (T6); Udzungwa mts (T7)
	51	<i>Kraussia</i>	64	<i>Kraussia speciosa</i>	Kimboza F.R.	Nguru mts (T6); Usambaras (T3); Taita (K7)
	52	<i>Lagynias</i>	65	<i>Lagynias rufescens ssp. rufescens</i>	Tanana	Nguru mts (T6)
	53	<i>Lasianthus</i>	66	<i>Lasianthus pedunculatus</i>	Morningside; Mkambaku mt	Nguru mts (T6)
	54	<i>Mussaenda</i>	67	<i>Mussaenda microdonta ssp. microdonta</i>	Mgeta R. above Hululu falls	Usambaras (T3)
	55	<i>Pavetta</i>	68	<i>Pavetta sp. D</i>	Mzinga falls	Mwanihana F.R. (T7)
	56	<i>Psychotria</i>	69	<i>Psychotria goetzei var goetzei</i>	Kitundu	Usambaras (T3); Iringa (T7)
			70	<i>Psychotria megalopus</i>	Hululu falls Mgeta river	Ulanga (T6); Mufindi (T7)
			71	<i>Psychotria pandurata</i>	Kinole	Usambaras (T3)
			72	<i>Psychotria schliebenii var schliebenii</i>	Hululu falls Mgeta river	Ngezi forest Pemba (P)
			73	<i>Psychotria schliebenii var sessilipaniculata</i>	Tanana	Usambaras (T3); Taita (K7)
			74	<i>Psychotria tanganyicensis var ferruginea</i>	Bunduki	Usambaras (T3); Ulanga (T6)
	57	<i>Rytigynia</i>	75	<i>Rytigynia pseudolongicaudata</i>	Lukwangule plateau	Nguru mts (T6); Ukaguru (T5); Udzungwa (T7)
	58	<i>Tricalysia</i>	76	<i>Tricalysia anomala var anomala</i>	Tanana	Usambaras (T3)
			77	<i>Tricalysia acidophylla</i>	Kimboza F.R.	Ulanga & Nguru mts (T6); Handeni (T3)
			78	<i>Tricalysia microphylla</i>	Kitundu	Nguru mts (T6); Usambaras (T3); K7; Z
			79	<i>Tricalysia pedicellata</i>	Kimboza F.R.	Vuma hills Mikumi & Nguru mts (T6)
Sapotaceae	59	<i>Aningeria</i>	80	<i>Aningeria pseudoracemosa</i>	Kimboza F.R.	Usambaras (T3)
Thymelaeaceae	60	<i>Peddiea</i>	81	<i>Peddiea subcordata</i>	Bondwa; Bunduki F.R.	Nguru mts (T6); Ukaguru mts (T5)
	61	<i>Dicranolepis</i>	82	<i>Dicranolepis usambarica</i>	Mwere valley	Nguru mts (T6); Usambaras (T3); K7
Verbenaceae	62	<i>Clerodendrum</i>	83	<i>Clerodendrum sansibarense ssp. caesium</i>	Lupanga	Mufindi (T7)
	63	<i>Vitex</i>	84	<i>Vitex amaniensis</i>	NW Uluguru F; Tanana; Bunduki F.	Usambaras (T3)
Vitaceae	64	<i>Cyphostemma</i>	85	<i>Cyphostemma braunii</i>	NW Uluguru F.R.	Usambaras (T3); Taita hills (K7)
Zingiberaceae	65	<i>Aframomum</i>	86	<i>Aframomum alpinum</i>	Bunduki F.R.	Usambaras (T3); Mufindi (T7)
			87	<i>Aframomum laxiflorum</i>	NW Uluguru Mts	Udzungwa mts (T7)
	66	<i>Costus</i>	88	<i>Costus sarmentosus</i>	Tegetero	Usambaras (T3); Taita hills (K7); Zanzibar (Z.); P
	67	<i>Renealmia</i>	89	<i>Renealmia engleri</i>	Tegetero	Usambaras (T3); K5

3.2.1 Distribution of the Uluguru Mountains near endemics

The near endemics of the Uluguru Mountains are distributed to other Eastern Arc Mountains of Taita, Pare, Usambaras, Nguru, Ukaguru, Mwanihana, Udzungwa and Mahenge (Table 4; Fig 3). They also occur in such diverse areas as Iringa, Kilosa, Lindi, Rungwe, Njombe, Kitulo plateau, Mtibwa, Mufindi, Ngezi forest in Pemba Island and Vuma hills in Mikumi National Park. Although the Uluguru and the Ukaguru Mountains are geographically closer to each other, they have very few vascular plant species in common. On the other hand, the Uluguru Mountains have more species in common with the Usambara, Pare and Nguru Mountains (Fig. 3). There are also species common to the Uluguru and the Taita hills in Kenya.



3.2.2 Habits and habitats of the Uluguru Mountains near endemics

The major habitats and habits of the vascular plants near endemic to the Uluguru Mountains are shown in Table 5. Out of the 89 near-endemic species, 32 are herbs, 28 are trees, 19 are shrubs, 5 are epiphytic herbs and 5 are climbers. The species grow in diverse habitats, although about 40% of them are exclusively found in montane forests. The rest are distributed among habitats as

diverse as the lowland, riverine, dry, sloping exposed rocks, montane grasslands, dry evergreen forests or dry riverine thickets. The altitude ranges from around sea level to 2,800 m above sea level.

Table 5. The Habit and Habitat of the Uluguru Mountains Near Endemics

Family	Genus	Species	Distribution in the Ulugurus	Where else found	Habitat	
Acanthaceae	1 <i>Brillantaisia</i>	1 <i>Brillantaisia ulugurica</i>	Mgeta R. (Bunduki); Morningside	Mwanihana FR; Mufindi, Iringa (T7)	Herb	
	2 <i>Isoglosa</i>	2 <i>Isoglosa lactea</i>	Ng'ubalale; Uluguru F.R., Palu	Nguru; Usambaras (T3)	Herb	
	3 <i>Justicia</i>	3 <i>Justicia interrupta</i>	Ng'ubalale; Uluguru F.R.	Nguru mts; Usambaras mts (T3)	Herb	
Aloeaceae	4 <i>Aloe</i>	4 <i>Aloe bussei</i>	? Nguru ya ndege	Kilosa (T5); Iringa (T7)	Herb	
Amaryllidaceae	5 <i>Crinum</i>	5 <i>Crinum politifolium</i>	? Uluguru mts	T3; T7	Herb	
Annonaceae	6 <i>Uvariadendron</i>	6 <i>Uvariadendron gorgonis</i>	Kimboza F.R.	Nguru mts (T6)	Tre	
Apiaceae	7 <i>Lefebvrea</i>	7 <i>Lefebvrea droopii</i>	Kunyema; Lukwangule; Lupanga	Nguru mts (T6)	Herb	
		8 <i>Cryptotaenia</i>	8 <i>Cryptotaenia calycina</i> var. <i>calycina</i>	? Uluguru NW side	Nguru mts (T6)	Herb
			9 <i>Cryptotaenia polygama</i>	Morningside; Tanana	Pare mts (T3)	Herb
Araceae	9 <i>Amorphophalus</i>	10 <i>Amorphophalus stuhlmannii</i>	Kimboza F.R.	Ulanga (T6); Usambaras (T3)	Herb	
Araliaceae	10 <i>Polyscias</i>	11 <i>Polyscias stuhlmannii</i> var. <i>stuhlmannii</i>	Lupanga	Usambaras (T3), K7	Tre	
Balsaminaceae	11 <i>Impatiens</i>	12 <i>Impatiens kentrodonta</i>	Bondwa; Salaza forest	Ukaguru mts (T5)	Herb	
			13 <i>Impatiens pallide-rosea</i> var. <i>lupangensis</i>	Bondwa; Lupanga	Ukaguru mts (T5)	Herb
			14 <i>Impatiens hamata</i>	Bondwa; Lupanga	Nguru mts (T6)	Herb
Boraginaceae	12 <i>Tournefortia</i>	15 <i>Tournefortia usambarensis</i>	Tanana	Usambaras (T3)	Herb	
Clusiaceae	13 <i>Allanblackia</i>	16 <i>Allanblackia ulugurensis</i>	Morningside; Lupanga	Nguru mts (T6), Iringa (T7)	Tre	
			17 <i>Allanblackia stuhlmannii</i>	Mngazi river	Usambaras (T3); T7	Tre
	14 <i>Garcinia</i>	18 <i>Garcinia semseii</i>	Kimboza F.R.	Nguru mts (T6)	Tre	
Convolvulaceae	15 <i>Stictocardia</i>	19 <i>Stictocardia lutambensis</i>	? Uluguru mts	Lindi (T8)	Clim	
Crassulaceae	16 <i>Kalanchoe</i>	20 <i>Kalanchoe obtusa</i>	Kimboza F.R.	Usambaras (T3); Teita hills (K7)	Herb	
Dichapetalaceae	17 <i>Dichapetalum</i>	21 <i>Dichapetalum eickii</i>	Bondwa	Usambaras (T3); Teita hills (K7)	Clim	
Dioscoreaceae	18 <i>Dioscorea</i>	22 <i>Dioscorea longicuspis</i>	Bondwa	Usambaras (T3)	Clim	
Euphorbiaceae	19 <i>Erythrococca</i>	23 <i>Erythrococca uluguruensis</i>	Bondwa	Iringa (T7); Kilwa (T8)	Shrub	
	20 <i>Euphorbia</i>	24 <i>Euphorbia quadrialata</i>	Kimboza F.R.	Pare, Handeni, Lushoto (T3)	Tre	
	21 <i>Suregada</i>	25 <i>Suregada lithoxyla</i>	Kimboza F.R.	Usambaras (T3)	Tre	
Fabaceae	22 <i>Zenkerella</i>	26 <i>Zenkerella egregia</i>	Kimboza F.R.	Nguru mts; Malundwe (T6); Usambaras (T3)	Tre	
			27 <i>Zenkerella capparidacea</i> ssp. <i>capparidacea</i>	Mwere; Lupanga	Nguru mts (T6)	Tre
	23 <i>Milletia</i>	28 <i>Milletia sericantha</i>			Tre	

		29	<i>Milletia elongatistyla</i>				
		30	<i>Milletia oblata ssp. intermedia</i>	T3/T6/T7			
	24	<i>Crotalaria</i>	31	<i>Crotalaria lukwangulensis</i>	K7/T3/T6		
	25	<i>Isoberlinia</i>	32	<i>Isoberlinia scheffleri</i>	Kimboza F.R.	Nguru mts (T6); Usambaras (T3)	
Hamamelidaceae	26	<i>Trichocladus</i>	33	<i>Trichocladus goetzei</i>	S. Uluguru Forest; Lukwangule	Iringa, Rungwe (T7)	
Icacinaceae	27	<i>Alsodeiopsis</i>	34	<i>Alsodeiopsis schumannii</i>	Bondwa	Usambaras (T3)	
Iridaceae	28	<i>Gladiolus</i>	35	<i>Gladiolus rupicola</i>	NW Uluguru F.R.	Usambaras (T3); Teita (K7); Iringa (T7)	
	29	<i>Moraea</i>	36	<i>Moraea callista</i>	Msumbisi (Mzumbi)	Kitulo plateau; Mtorwi mt.	
Lobeliaceae	30	<i>Lobelia</i>	37	<i>Lobelia longisepala</i>	? Uluguru Eastern side	Ulanga (T6); Usambaras (T3)	
Melastomataceae	31	<i>Dissotis</i>	38	<i>Dissotis polyantha</i>	Morningside; Lupanga	Iringa (T7)	
		32	<i>Gravesia</i>	39	<i>Gravesia pulchra var. glandulosa</i>	Bondwa; Tanana	Nguru mts (T6)
		33	<i>Medinilla</i>	40	<i>Medinilla engleri</i>	Lupanga	Usambaras (T3)
		34	<i>Memecylon</i>	41	<i>Memecylon cogniauxii</i>	Tegetero	Usambaras (T3)
Montiniaceae	35	<i>Grevea</i>	42	<i>Grevea eggelingii ssp. eggelingii</i>	Magandu; Morogoro river	Mtibwa (T6); Handeni (T3)	
Moraceae	36	<i>Dorstenia</i>	43	<i>Dorstenia goetzei</i>	Lukwangule plateau	Usambaras (T3); Ulanga (T6); Teita (K7)	
			44	<i>Dorstenia hildebrandtii var. hildebrandtii</i>	Kimboza F.R.	Usambaras (T3); K1	
Orchidaceae	37	<i>Ancistrorhynchus</i>	45	<i>Ancistrorhynchus laxiflorus</i>	Mindu hill	Ulanga (T6); Iringa (T7))	
		38	<i>Bulbophyllum</i>	46	<i>Bulbophyllum gilgianum</i>	Lupanga	Udzungwa mts (T7)
		39	<i>Diaphananthe</i>	47	<i>Diaphananthe meliantha</i>	Lukwangule plateau	Iringa; Rungwe (T7)
		40	<i>Margelliantha</i>	48	<i>Margelliantha leedalii</i>	Bondwa; Lupanga	Teita hills (K7); Iringa (T7)
		41	<i>Neobenthamia</i>	49	<i>Neobenthamia gracilis</i>	Lupanga	Nguru mts (T6); Handeni (T3)
		42	<i>Polystachya</i>	50	<i>Polystachya caespitifica ssp. caespitifica</i>	Bondwa; Mwere valley	Usambaras (T3)
			51	<i>Polystachya isochiloides</i>	Mindu hill	Mt Nyogi Handeni (T3); Usambaras (T3)	
			52	<i>Polystachya melanantha</i>	Bondwa	Nguru mts (T6); Mozambique?	
			53	<i>Polystachya subdiphylla</i>	Bunduki	Nguru mts (T6)	
			54	<i>Polystachya ulugurensis</i>	Bondwa; Maunga valley	Ulanga (T6); Iringa (T7))	
	43	<i>Tridactyle</i>	55	<i>Tridactyle brevifolia</i>	Bondwa	Nguru mts (T6)	
			56	<i>Tridactyle phaeocephala</i>	Lukwangule plateau; Bondwa	Pare mts (T3)	
Oxalidaceae	44	<i>Biophytum</i>	57	<i>Biophytum turianense</i>	Mkungwe hil	Nguru mts (T6)	
Rhizophoraceae	45	<i>Cassipourea</i>	58	<i>Cassipourea rotundifolia</i>	Lukwangule plateau	Iringa (T7), K4	
Rubiaceae	46	<i>Ancylanthos</i>	59	<i>Ancylanthos rufescens ssp. rufescens</i>	Tanana	Nguru mts (T6)	

	47	<i>Bertiera</i>	60	<i>Bertiera pauloi</i>	? Uluguru mts	Ulanga (T6); Iringa (T7)	Tre
	48	<i>Chassalia</i>	61	<i>Chassalia discolor ssp. discolor</i>	Kitundu	Nguru mts (T6); Usambaras (T3)	Shr
	49	<i>Danais</i>	62	<i>Danais xanthorrhoea</i>	Hululu falls; Mgeta river	Usambaras	Clin
	50	<i>Ixora</i>	63	<i>Ixora tanzaniensis</i>	Kimboza F.R.	Ulanga (T6); Udzungwa mts (T7)	Shr
	51	<i>Kraussia</i>	64	<i>Kraussia speciosa</i>	Kimboza F.R.	Nguru mts (T6); Usambaras (T3); Teita (K7)	Shr
	52	<i>Lagynias</i>	65	<i>Lagynias rufescens ssp. rufescens</i>	Tanana	Nguru mts (T6)	Shr
	53	<i>Lasianthus</i>	66	<i>Lasianthus pedunculatus</i>	Morningside; Mkambaku mt	Nguru mts (T6)	Shr
	54	<i>Mussaenda</i>	67	<i>Mussaenda microdonta ssp. microdonta</i>	Mgeta R. above Hululu falls	Usambaras (T3)	Tre
	55	<i>Pavetta</i>	68	<i>Pavetta sp. D</i>	Mzinga falls	Mwanihana F.R. (T7)	Shr
	56	<i>Psychotria</i>	69	<i>Psychotria goetzei var goetzei</i>	Kitundu	Usambaras (T3); Iringa (T7)	Shr
			70	<i>Psychotria megalopus</i>	Hululu falls Mgeta river	Ulanga (T6); Mufindi (T7)	Tre
			71	<i>Psychotria pandurata</i>	Kinole	Usambaras (T3)	Shr
			72	<i>Psychotria schliebenii var schliebenii</i>	Hululu falls Mgeta river	Ngezi forest Pemba (P)	Shr
			73	<i>Psychotria schliebenii var sessilipaniculata</i>	Tanana	Usambaras (T3); Teita (K7)	Shr
			74	<i>Psychotria tanganyicensis var ferruginea</i>	Bunduki	Usambaras (T3); Ulanga (T6)	Shr
	57	<i>Rytigynia</i>	75	<i>Rytigynia pseudolongicaudata</i>	Lukwangule plateau	Nguru mts (T6); Ukaguru (T5); Udzungwa (T7)	Tre
	58	<i>Tricalysia</i>	76	<i>Tricalysia anomala var anomala</i>	Tanana	Usambaras (T3)	Shr
			77	<i>Tricalysia acidophylla</i>	Kimboza F.R.	Ulanga & Nguru mts (T6); Handeni (T3)	Shr
			78	<i>Tricalysia microphylla</i>	Kitundu	Nguru mts (T6); Usambaras (T3); K7; Z	Shr
			79	<i>Tricalysia pedicellata</i>	Kimboza F.R.	Vuma hills Mikumi & Nguru mts (T6)	Shr
Sapotaceae	59	<i>Aningeria</i>	80	<i>Aningeria pseudoracemosa</i>	Kimboza F.R.	Usambaras (T3)	Tre
Thymelaeaceae	60	<i>Peddiea</i>	81	<i>Peddiea subcordata</i>	Bondwa; Bunduki F.R.	Nguru mts (T6); Ukaguru mts (T5)	Tre
	61	<i>Dicranolepis</i>	82	<i>Dicranolepis usambarica</i>	Mwere valley	Nguru mts (T6); Usambaras (T3); K7	Shr
Verbenaceae	62	<i>Clerodendrum</i>	83	<i>Clerodendrum sansibarense ssp. caesium</i>	Lupanga	Mufindi (T7)	Shr
	63	<i>Vitex</i>	84	<i>Vitex amaniensis</i>	NW Uluguru F.R.; Tanana; Bunduki F.R.	Usambaras (T3)	Tre
Vitaceae	64	<i>Cyphostemma</i>	85	<i>Cyphostemma braunii</i>	NW Uluguru F.R.	Usambaras (T3); Teita hills (K7)	Clin
Zingiberaceae	65	<i>Aframomum</i>	86	<i>Aframomum alpinum</i>	Bunduki F.R.	Usambaras (T3); Mufindi (T7)	Her
			87	<i>Aframomum laxiflorum</i>	NW Uluguru Mts	Udzungwa mts (T7)	Her
	66	<i>Costus</i>	88	<i>Costus sarmentosus</i>	Tegetero	Usambaras (T3); K7; Z.; P	Her
	67	<i>Renealmia</i>	89	<i>Renealmia engleri</i>	Tegetero	Usambaras (T3); K5	Her

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