

JOURNAL OF THE EAST AFRICA NATURAL HISTORY SOCIETY AND NATIONAL MUSEUM

VOL. 28

15th MARCH 1972

No. 130

ANNOTATED CHECK-LIST OF PLANTS OCCURRING IN LAKE MANYARA NATIONAL PARK

By

P. J. GREENWAY AND D. F. VESEY-FITZGERALD

INTRODUCTION

This check-list has been compiled to serve several interests. In the first place systematic botanists need to make name changes from time to time, so ecologists working in the park will find it useful to have a list of currently accepted names. Each determination is supported by a voucher number referring to a specimen retained in the Lake Manyara National Park herbarium, and in most cases duplicated at the Royal Botanic Gardens, Kew and in the East African Herbarium in Nairobi.

Lake Manyara lies in the botanical region designated T2 Northern Province of Tanzania, see map in the preface to the Flora of Tropical East Africa (1952). The species listed and the vegetation described are typical of a wide area in this region. The list should therefore be useful to botanists visiting this part of Tanzania.

Each species is annotated so as to give in the briefest possible form as much useful ecological information about the plant as possible.

The place where each plant usually occurs is indicated by a capital letter at the beginning of each citation:—

P = The plateau above the rift wall 1200 m (4000 ft) altitude.

E = The escarpment thicket woodland, 1000–1200 m (3200–4000 ft) altitude.

W = The *Acacia* woodland, including acacia parkland, in the valley below the rift wall, 960 m (3150 ft) altitude.

F = The groundwater or riverine forest which is irrigated by flowing water.

S = The swamp (freshwater) and other temporary wet sites and rainwater pools.

A = The alkaline lake bed soils, 945 m (3100 foot) altitude; much of this area is periodically flooded by the lake.

The growth form, of each plant, whether tree, shrub or herb (non-woody plant) is stated, with qualifications where applicable, namely ann. = annual, per = perennial. Abundance is indicated by the following abbreviations (va) = very abundant, (a) = abundant, (f) = frequent, (o) = occasional, (r) = rare.

Brief habitat details and the status of each species in the course of succession are also indicated. It is however sometimes difficult to decide the precise status of plants occupying secondary sites. Plants that are characteristic of zones of transition between two formations are recorded as occurring in ecotones. Those regularly occurring during certain stages of succession are classed as seral plants. Other plants commonly occurring at disturbed sites are recorded as ruderal. Plants that are generally common in their

proper environment but not usually found away from it are recorded as casuals in the latter case. Such often occur on silt banks in river courses, at road sides, in borrow-pits or as weeds of cultivation. Some of these may be pioneers which will later spread in the habitat as invaders. Several alien species from other countries occur in the park.

The arrangement and numbering of the families is according to the first edition of Hutchinson, J. 'Families of Flowering Plants', Dicotyledons (1926) and Monocotyledons (1944). The genera and species for ease of reference are arranged in alphabetical order.

F. T. E. A. with year and date indicates that the Family has been published in the Flora of Tropical East Africa, Crown Agents for Overseas Governments, London.

COLLECTORS

The following collectors have contributed to the park herbarium and their gatherings are initialed:—P.J. Greenway (G. numbers), Mrs. Dingle, formerly at the Lake Manyara Hotel (D. numbers), Mrs. Richards, a visiting botanist (MR. numbers) and D. Vesey-FitzGerald (VFG. numbers).

THE RAINFALL

The mean annual rainfall during the 10-year period 1961–70 at the Park headquarters situated below the Rift Wall, Long: 35° 51' E. Lat: 03° 21' S., 975 m. (3200 ft.) altitude, was 38 inches (970 mm.).

There are two peak periods, March to April (long rains) and November to December (short rains). June to October is a dry period.

The rainfall is variable, the lowest recorded during the decade was 11 inches (280 mm.) during 1969, and the highest 47 inches (1200 mm.) during 1968. The south end of the park is generally wetter. For example during 1968 the record at Msasa camp (Lat: 03° 26' S.) was 49 ins. (1240 mm.); at Ndala camp (Lat: 03° 28' S.) 47 ins. (1200 mm.) and at Endabash river delta (Lat: 03° 34' S.) 63 ins. (1600 mm.).

The level of the lake varies as a result of the rainfall over the catchment area. During 1960 the lake-bed flats were covered with sparse alkaline grassland and no water was visible from shore level. By 1970 the flats were completely inundated to a depth of over 3 m and the water had encroached into the tree line approximately along the 960 m (3150 ft.) contour.

THE VEGETATION

The vegetation of L. Manyara National Park has been described by Greenway and Vesey-FitzGerald (1969), and the role of the vegetation as a habitat for indigenous animals (pasture and browse) by Vesey-FitzGerald (1969).

The plant formations and associations are divided into three sequences (catenas) related to the drainage, namely:—

(i) the vegetation related to the land drainage from the plateau above the rift wall.

(ii) the vegetation that is irrigated by springs emerging from the base of the rift wall.

(iii) the zones of vegetation around the shallow alkaline lake.

In addition there is a number of plants occurring only at special sites that are not related to the catenary arrangement.

(1) *The land drainage catena.* The plateau above the north end of the park at 1200 m. alt. comprises a lava cap dissected by a steep-sided valleys. Above the northern end of the park the country is level and strewn with lava boulders and the soil is a badly drained dark red clay loam. The existing vegetation here is much disturbed. It comprises fire-induced grassland and wooded grassland. Between the Msasa and Endabash rivers the upland country is more broken and there are exposures of granitic rocks on

the ridges. Deeply dissected rocky gorges and waterfalls are a feature of the drainage from the plateau to the lake. The vegetation here is mainly secondarily derived wooded grassland. Relict vegetation survives in the gorges.

Above the south end of the park, in the catchment of the Endabash river, the escarpment is higher 1500 m. alt. and the plateau is hilly. Outcrops of granitic rock occur and the soil is a well-drained red sandy loam. The vegetation of the Marang forest reserve is a dry evergreen forest, but outside the reserve where the ground is not so high it is secondary fire-induced wooded grassland. None of the highland forest and only a fringe of the plateau lie within the park.

The escarpment face and the slopes of the valleys are steep and rocky. The vegetation here is a deciduous woodland and dry thicket, both of which have been modified by fire or replaced by secondary derived wooded grassland on the less steep slopes. In the valleys and along the streams there is fringing forest which in most parts has been modified by cutting and burning. Below the rift wall the slope is less steep and composed of rubble detritus. The valley floor is covered with redistributed soils supporting groundwater (*Acacia*) woodland with a grassy ground cover. This woodland has been modified by both fire and elephants.

(2) *The Groundwater Forest.* At the north end of the park a number of springs emerge from among lava boulders at the foot of the escarpment. These springs irrigate areas of closed canopy groundwater forest which is unrelated to the local climatic regime. The component tree species are large but probably rather short-lived. Within the forest there are freshwater swamps and glades of edaphic valley grassland. These are modified by indigenous grazing animals.

(3) *The alkaline lake.* The lake bed consists of deposits of alkaline silts, sands and clays which are exposed during periods of low lake levels but are inundated when the lake is high. Grasslands, including pure stands of sedge in boggy places, grow on these deposits, their extent and zonation depending on the varying level of the lake. These grasslands provide the most valuable pastures in the park.

THE FLORA

To date (1971) 671 species of flowering plants and 11 ferns have been found in the park. These are contained in 300 genera and 96 families. Further collecting and taxonomic work may add to the list but will not materially alter the statistics of the flora.

Of the 91 families of flowering plants 33 (36%) contain only 1 genus, 18 (20%) 2 genera, 30 (34%) 3-9 genera and 9 (10%) more than 10 genera.

The 9 largest families are Graminae (42 genera), Compositae (34), Papilionaceae (20), Acanthaceae (18), Labiatae (11), Rubiaceae (11), Amaranthaceae (10), Asclepiadaceae (10) and Cucurbitaceae (10). These together contain 275 (44%) of the species.

Two hundred and seventy two (71%) of the genera contain only one species; 23 genera (6%) contain 5 or more species. The largest genera are *Cyperus* (12 species), *Euphorbia* (10), *Indigofera* (10), *Ipomoea* (10), *Justicia* (10), *Acacia* (9) and *Ficus* (9).

Two hundred and forty six (40%) of all the species collected in the park are classed as ruderals.

ACKNOWLEDGEMENTS

We wish to thank Dr. J. S. Owen, the former Director, and Mr. Ole Saibul, the present Director of the Tanzanian National Parks, and Dr. O. Starnes, Director of the East African Agricultural and Forestry Research Organization, for encouraging us to undertake a botanical and ecological survey of the Lake Manyara National Park and for their permission to publish the results. We wish also to thank our colleagues in the East African Herbarium and Tanzania National Parks for assistance in the collection, preparation and determination of specimens.

DICOTYLEDONS

17 Ceratophyllaceae

Submerged aquatic plants

Ceratophyllum submersum L.

S. herb aquatic (o) in pools G11869; 11256.

18 Nymphaeaceae Water lilies.

Nymphaea caerulea Savi.

S. herb aquatic (f) rainwater pools G11255.

N. lotus L.

S. herb aquatic (a) rainwater pools G11254.

23 Menispermaceae F. T. E. A. (1956)

Cissampelos mucronata A. Rich.

F. Liane with woody rootstock VFG 6870.

26 Hydnoraceae

Hydnora abyssinica Schweinf.

W. & E. parasite on roots of Acacia; a fungus-like plant with fleshy warted subterranean rhizome, flowers tubular, large flushed red and pink, occasionally seen appearing from cracks in the ground G11132.

28 Piperaceae Wild pepper.

Piper umbellatum L.

F. shrub (f) streamsides in forest shade G11020.

36 Capparaceae F. T. E. A. (1964) Capers.

Boscia salicifolia Oliv.

W. & E. tree (o) G11404.

Cadaba farinosa Forsk. ssp. *farinosa*

W. shrub (a) in dry places, fls. during dry season G10999; 10290.

Capparis fascicularis (Gilg.) De Wolf var. *elaegnoides* (Gilg) De Wolf

W. shrub often scandent (a) fls. during dry season G12047.

C. tomentosa Lam.

E. & W. riverine shrub D342.

Cleome hirta (Klotzsch) Oliv.

W. herb ann. (f) ruderal G11242.

C. monophylla L.

W. herb ann. (o) ruderal G11157.

Gynandropsis gynandra (L.) Briq.

W. herb ann. (a) ruderal G11091.

Maerua angolensis DC.

E. shrub (o) G11805.

M. edulis (Gilg & Bened.) De Wolf

W. woody herb per. secondary sites (a) D328.

M. triphylla A. Rich. var. *johannis* (Volkens & Gilg) De Wolf

W. shrub (va) dominant in understory Acacia woodland, fls. during dry season G10945.

Thylachium africanum Lour.

W. shrub (va) throughout, fls. dry season G10988.

39 Cruciferae Stocks, Watercress etc.

Farsetia stenoptera Hochst.

W. herb ann. (o) ruderal G12018.

Rorippa nasturtium-aquaticum (L.) Hayek

Special sites, spring heads and streams herb (va) where occurring D90.

42 Polygalaceae Milk-wort.

Polygala erioptera DC.

W. herb ann. (a) ruderal G11317.

P. kilimandjarica Chod.

P. a geophyte in fire degraded derived woody grassland VFG6903.

P. sphenoptera Fresen.

W. herb ann. (o) ruderal G11367.

45 Crassulaceae Stone crop

- Crassula alsinoides* (Hook.f.) Engl.
E. herb per. (r) on rocks G11855.
Kalanchoe lanceolata (Forsk.) Pers.
E. herb succulent per. (a) rocky places G11892.
K. mitejea Le Bl. & Hamet
E. herb per succulent with purple spotted leaves (o) rocky places G11893.
Kalanchoe sp.
E. (in gorges) herb succulent D195.

54 Aizoaceae F. T. E. A. (1961).

- Corbichonia decumbens* (Forsk.) Exell
F. & W. herb ruderal D283.
Gisekia pharnaceoides L. var. *pharnaceoides*
W. herb ann. ruderal G11147.
Glinus lotooides L.
W. herb ann. locally (a) dry mud of water holes G11306.
Limeum viscosum (J. Gay) Fenzl. ssp. *viscosum*
W. herb ann. (f) ruderal G11283.
Mollugo nudicaulis Lam.
W. herb ann. (a) ruderal G11860.
Trianthema salsoloides Oliv.
A. herb ann. (f) ruderal lake shore G11214.
Zaleya pentandara (L.) C. Jeffrey
W. herb ann. (va) ruderal G11863.

56 Portulacaceae Portulaca.

- Portulaca oleracea* L.
W. herb per. (f) ruderal G11262.
P. quadrifida L.
W. herb ann. (f) ruderal G11128.
Talinum caffrum (Thunb.) Eckl. & Zey.
W. herb per. (f) ruderal G11127.
T. portulacifolium (Forsk.) Schweinf.
E. & W. herb ruderal D67.

57 Polygonaceae F. T. E. A. (1958). Docks.

- Oxygonum sinuatum* (Meisn.) Dammer
W. herb ann. (a) ruderal G11837.
Polygonum salicifolium Willd.
F. herb per. (o) stream sides G12038.
P. senegalense Meisn. f. *senegalense*
S. herb per. (o) pools G10955.
Rumex bequartii De Wild.
W. herb ruderal wet places D382.

61 Chenopodiaceae F. T. E. A. (1954) Goosefoot.

- Chenopodium opulifolium* (Schrad.) Koch & Ziz
W. herb ann.(o) ruderal G11081.

63 Amaranthaceae Amaranthus, Cock's comb.

- Achyranthes aspera* L.
W. herb per. (va) overgrazed waste land ruderal G11236.
Aerva lanata (L.) Schult.
W. herb per. (o) ruderal G11139.
Alternanthera pungens H. B. & K.
W. herb per. (a) ruderal G11198.
A. sessilis (L.) R.Br.
S. in F. herb per. (o) streamsides G11112.
Amaranthus dubius Thell.
E. herb ann. (f), ruderal stony places G11891.
A. graecizans L. ssp. *graecizans*
W. herb ann. (f) ruderal G11050.
Celosia schweinfurthiana Schinz
F. herb per. (f) cool moist places G11201.

- Cyathula orthacantha* (Hochst.) Schinz
W. & F. herb ann. (f) in clearings G11193.
Digera muricata (L.) Mart.
W. herb ann. (a) ruderal G11188.
Gomphrena celosioides Mart.
W. herb per. (r) in dry river bed G11391.
Psilotrichum elliotii Bak. & C.B. Cl.
W. herb per. (r) in dry river bed G11380.
Pupalia lappacea (L.) Juss.
W. herb scandent in shrub group (o) VFG6740.
Sericocomopsis hildebrandtii (C.B.Cl.) Schinz
E. herb or low shrub (a) stony ground open sites G11827.

66 Zygophyllaceae

- Tribulus terrestris* L.
W. herb ann. (va) ruderal G11146.

67 Geraniaceae F. T. E. A. (1971) Geraniums, Cranes-bills.

- Pelargonium alchemilloides* (L.) Ait. (Syn. *P. multibracteatum* Hochst.)
E. herb (o) top of rift wall amongst rocks D269.
P. quinquelobatum A. Rich.
E. herb top of rift wall (o) D221.

71 Balsaminaceae Balsams.

- Impatiens rubromaculata* Warb.
F. herb short-lived per. (f) cool wet shaded places VFG6430.

72 Lythraceae

- Ammannia prieuriana* Guill. & Perr.
S. herb (o) wet places G11270.

77 Onagraceae F. T. E. A. (1953)

- Ludwigia abyssinica* A. Rich. (Syn. *Jussiaea abyssinica* (A. Rich.) Dandy & Brenan).
S. herb per. (f) pools and waterside sites G11053.
L. stolonifera (Guill. & Perr.) Raven, in *Reinwardtia*, 6: 327 (1963).
S. herb per. (f) wet muddy places G11194.

83 Nyctaginaceae

- Boerhavia coccinea* Mill.
W. herb per. (va) ruderal G12084.
B. erecta L.
W. herb per. (va) ruderal G11222.
B. repens L.
W. herb ruderal D249B.
Commicarpus plumbagineus (Cav.) Standl.
W. herb semi-scandent (a) ruderal G11884.

93 Flacourtiaceae Kei Apple family.

- Douyalis macrocarpa* Bamps
W. & F. shrub (f) G11042; 11312.
D. xanthocarpa Bullock.
W. & E. shrub (a) fls. dry season G10949.
Ludia sessiliflora Lam.
E. (riverine) shrub D376.
Oncoba spinosa Forsk.
E. shrub locally (f) at rocky base of escarpment G12034.
O. spinosa Forsk. var. *routledgei* (Sprague) Sleumer
E. & F. shrub or small tree (o) riverine at base of rift wall G10959.

95 Canellaceae F. T. E. A. (1956).

- Warburgia ugandensis* Sprague
E. tree (o) in riverine forest G11866.

101 **Passifloraceae** Passion-flower family.

- Adenia cissampeloides* Harms
E. shrub river gorge D123
A. schweinfurthii Engl. (Syn. *A. lobata* (Jacq.) Engl.).
F. liane (o) G11067.
A. volkensii Harms.
E. shrub (o) G11136.
A. wrightiana (Well.) Engl.
W. herb scandent (a) ruderal G11293.
Tryphostemma sp.
W. herb (o) G11883.

103 **Cucurbitaceae** F. T. E. A. (1967) Cucumbers.

- Citrullus lanatus* (Thunb.) Mansf.
W. herb (r) dry water course G11818.
Coccinia grandis (L.) Voigt.
W. vine per. (f) G11123; 11030; 10952.
Corollocarpus epigaeus (Rottl.) C.B.Cl.
Vine Chem Chem G13191.
Ctenolepis cerasiformis (Stocks) Hook. f.
E. vine (o) G11291. D187.
Cucumis aculeatus Cogn.
Msasa Gorge fruit only D111 a.
C. dipsaceus Spach.
W. vine per. (f) G11049. D134.
C. figarei Naud.
W. vine ann. (f) dry water course G11880.
Diplocyclos palmatus (L.) C. Jeffrey
F. herb climbing D322.
Kedrostis foetidissima (Jacq.) Cogn.
Endabash R. delta G11835.
K. hirtella (Naud.) Cogn.
W. vine (o) G12040; 6961.
Lagenaria siceraria (Molina) Standley.
W. vine (a) G11212. D135; 293.
L. sphaerica (Sond.) Naud.
E. vine per. (f) G12035. D292.
Peponium vogelii (Hook. f.) Engl.
F. herb climbing D281.
Zehneria scabra (L.f.) Sond.
F. & W. herb climbing D287.

114 **Ochnaceae**

- Ochna ovata* O. Hoffm.
E. shrub (f) G11055.

118 **Myrtaceae** Clove family

- Syzygium guineense* (Willd.) DC.
F. tree (o) riverine G12021.

121 **Combretaceae**

- Combretum molle* G. Don.
E. & P. tree fire degraded woodland (a) VFG 5999.
Terminalia brownii Fresen.
E. tree (a) woodland on slopes and in gorges G10985.

126 **Guttiferae**

- Garcinia livingstonei* T. Anders.
F. tree (o) in river gorges G11372.

128 **Tiliaceae** Jute family.

- Corchorus tridens* L.
E. herb ann. (a) ruderal G11244.
C. trilocularis L.
E. herb ann. (o) ruderal G11898
Grewia mollis Juss.
E. and W. shrub (f) D333.

- G. tembensis* Fresen. v. *kakothamnos* (K. Schum.) Burret
E. shrub (f) G11130.
G. trichocarpa A. Rich.
P. & E. shrub or small tree (f) rocky outcrops G12026.
G. villosa Willd.
E. shrub (f) G11131.
Triumfetta flavescens A. Rich.
W. shrub ruderal (a) G11014.
T. rhomboidea Jacq.
W. shrub ruderal (a) G11313.

130 **Sterculiaceae** Cola, Cocoa family

- Dombeya kirkii* Mast. (Syn. *D. unbraculifera* K. Schum.)
E. tree locally (f) D163.
Hermannia glanduligera K. Schum.
W. herb per. (f) ruderal G11005.
H. uhligii Engl.
W. herb woody per. (a) ruderal G11832.
Melhamia velutina Forsk.
W. herb woody per (f) ruderal G11300.
Sterculia stenocarpa H. Winkl.
E. tree (a) G11407; 12019.
Waltheria indica L.
Woody herb Ndala River G13192.

131 **Bombacaceae** Baobab.

- Adansonia digitata* L.
E. tree (f) woodland thicket escarpment face and lower slopes occasionally to lake shore in
Acacia tortilis woodland G10953.

132 **Malvaceae** Mallows, Cotton family.

- Abutilon angulatum* Mast.
E. woody herb D257.
A. bidentatum Hochst.
W. robust herb (f) ruderal VFG5962.
A. grandiflorum G. Don
Woody herb robust (f) G11368.
A. hirtum (Lam.) Sweet
W. herb robust per. (f) ruderal VFG 5963.
A. ramosum (Cav.) Guill. & Perr.
E. and W. herb woody per. (f) ruderal VFG5964.
Azanza garckeana (F. Hoffm.) Exell & Hillcoat
P. shrub or small tree (a) fire degraded wooded grassland VFG 6900.
Hibiscus calophyllus Cav.
W. & F. shrub (a) G11111.
H. cannabinus L.
E. and river delta herb ann. (o) ruderal G11820.
H. dongolensis Del.
W. shrub (f) G11124.
H. micranthus L.f.
W. herb woody per. (a) ruderal G11000.
H. palmatus Forsk.
E. herb ann. (o) G11864.
H. panduriformis Burm. f.
F. & W. shrub D162.
H. vitifolius L. ssp. *vulgaris* Brenan & Exell.
E. herb ann. (o) ruderal waste ground G11363.
Pavonia patens (Andr.) Chiov.
W. herb woody per. (a) ruderal G11008.
Sida acuta Burm. f.
E. herb woody ann. (o) silt river delta G11910.
S. alba L.
Herb woody, Endabash River drift G11210; 11297.
S. ovata Forsk.
W. herb woody per. (va) ruderal G11285.
Wissadula periplocifolia (L.) C. Presl.
F. herb woody ann. (a) ruderal G11800.

133 Malpighiaceae F. T. E. A. (1968)

Caucanthus auricularis (Radlk.) Niedenz.

E. scandent shrub (f) G13252.

136 Euphorbiaceae Spurge family.

Acalypha fruticosa Forsk.

W. & E. shrub (va) throughout acacia woodland G11033.

A. indica L.

F. herb ann. (f) ruderal G11165.

A. ornata A. Rich.

F. herb woody (a) forest shade G11063.

Bridelia micrantha (Hochst.) Baill.

F. tree (a) ground water forest riverine G11114

Croton dichogamus Pax

E. shrub (f) in deciduous woodland VFG6902.

C. macrostachyus Del.

F. tree locally (a) pioneer forest edges and riverine G11210.

C. megalocarpa Hutch.

F. tree (f) riverine G10992.

C. scheffleri Pax

E. shrub (va) woodland-thicket G11035.

Drypetes natalensis (Harv.) Hutch.

F. tree (f) ground water forest G10964.

Euphorbia candelabrum Kotschy

E. tree (f) Sight record.

E. crotonoides Boiss.

W. herb (f) ruderal D242.

E. hirta L.

W. herb ann. (f) ruderal waste ground G11328.

E. heterochroma Pax

E. shrub spiny succulent locally (a) in thicket G11918.

E. inaequilatera Sond.

W. herb ann. (f) ruderal waste ground G11207.

E. nyikae Pax

E. tree succulent G11847.

E. scheffleri Pax

E. shrub (f) deciduous woodland thicket G11162.

E. spinescens Pax

E. shrub (f) deciduous woodland thicket G10947.

E. tetracanthoides Pax

E. herb succulent spiny D334. (very likely conspecific with *E. heterochroma*).

E. tirucalli L.

E. shrub locally (f) in thicket woodland. Sight record.

Jatropha fissispina Pax

E. shrub (o) disturbed ground G12025.

Phyllanthus engleri Pax

P. small tree (f) rocky ridges VFG6006.

P. fischeri Pax

F. shrub D248.

P. maderaspatensis L.

E. herb woody (a) G11171.

P. odontadenius Muell. Arg.

F. & W. herb D248.

P. reticulatus Poir.

P. shrub to 2m (f) fire degraded wooded grassland VFG6893.

P. sepialis Muell. Arg.

W. & E. shrub (va) in understory G11899.

Ricinus communis L.

W. robust herb or subshrub (a) ruderal redistributed silt G11324.

Tragia benthamii Bak.

P.E. & W. herb trailing (f) with urticating hairs. G11048.

T. brevipes Pax

F. & W. herb climbing D176.

146 Caesalpiniaceae F. T. E. A. (1967). Cassia, Tamarind,

Cassia absus L.

W. herb ann. (f) ruderal G11299.

- C. didymobotrya* Fresen.
 F. shrub (o) ruderal riverine silt banks and disturbed places. Sight record.
C. hilderbrandii Vatke.
 P. herb (f) hillside rocky ground MR24300.
C. italica (Mill.) F. W. Andr. ssp. *micrantha* Brenan
 E. herb (a) ruderal G11085.
C. mimosoides L.
 E. herb ann. (f) ruderal disturbed ground G11390.
C. occidentalis L.
 W. herb robust ann. (o) ruderal G11289.
Delonix elata (L.) Gamble
 E. tree (o) and local in ravines G11366.
Tamarindus indica L.
 F. & W. tree (a) riverine G11077.

147 **Mimosaceae** F. T. E. A. (1959) Acacia and Mimosa, thorn-trees.

- Acacia albida* Del.
 W. tree (a) in localised mature stands riverine G11225.
A. claviger E. May. ssp. *usambarensis* (Taub.) Brenan
 F. tree edges of ground water forest and riverine in gorges (a) G11216.
A. ethaica Schweinf. ssp. *platycarpa* Brenan
 E. tree (f) marginal to thicket woodland G11172.
A. hockii De Wild.
 E. & P. tree (a) fire degraded woodland VF6103.
A. mellifera (Vahl) Benth. ssp. *mellifera*
 E. & P. tree (a) marginal to thicket woodland G11206.
A. schweinfurthii Brenan & Exell var. *schweinfurthii* (Syn. *A. brevispica* Harms).
 F. & E. scandent shrub (va) thicket woodland G11774.
A. sieberiana D.C. var. *vermoesemii* (De Wild.) Keay & Brenan
 W. & F. tree (a) widespread G11004.
A. tortilis (Forsk.) Hayne ssp. *spirocarpa* (A. Rich.) Brenan
 E. & W. tree (va) dom. in woodland below and above escarpment fls. during dry season G11195.
A. xanthophloea Benth.
 W. & F. tree (va) occurring in groves high watertable sites G11771.
Albizia amara (Roxb.) Boiv. ssp. *sericocephala* (Benth.) Brenan
 P. & E. shrub or small tree (f) fire degraded wooded grassland or ridges D358.
A. anthelmintica Brongn.
 E. tree (f) G11921.
A. zimmermannii Harms
 F. tree (f) G12925.
Dichrostachyus cinerea (L.) Wight & Arn. ssp. *nyassana* (Taub.) Brenan
 P. shrub (f) fire degraded derived wooded grassland VFG689z.
Entada abyssinica (Steud.) A. Rich.
 E. tree rocky sites upper part of rift wall (r) G11859.

148 **Papilionaceae** F.T.E.A. (1971) Beans and Peas.

- Aeschynomene indica* L.
 S. herb ann. (f) wet places G11816.
Alysicarpus glumaceus (Vahl) DC. ssp. *glumaceus*
 E. herb ann. (o) ruderal disturbed ground G11392.
Calpurnia aurea Benth.
 F. shrub (f) marginal secondary growth G12061.
Canavalia virosa Wight & Arn.
 F. liane (o) G11163.
Clitoria ternatea L.
 E. herb scandent per. (a) secondary sites G12055.
Crotalaria cephalotes A. Rich.
 E. herb ann. (r) disturbed ground G11819.
C. goodiformis Vatke
 E. herb river gorge D284.
C. incana L. ssp. *incana*
 E. & W. herb ruderal D145.
C. incana L. ssp. *purpurascens* (Lam.) Milne-Redh.
 W. herb ann. (f) ruderal disturbed ground G11211.
C. laburnifolia L.
 E. shrub (o) ruderal disturbed ground G11824.
C. oocarpa Bak. ssp. *microcarpa* Milne-Redh.
 E. herb ann. (f) disturbed ground G11888.

- C. polysperma* Kotschy
W. herb (f) secondary growth G11287.
- Dalbergia melanoxydon* Guill. & Perr.
P. & E. tree (f) fire degraded woodland above rift wall G11403.
- D. nitidula* Bak.
PE. tree with rough fissured dark almost black bark, flowers white in dense clusters(o) VFG6894.
- Desmodium repandum* (Vahl) DC.
F. herb in shade D25.
- Dolichos oliveri* Schweinf.
E. herb woody ruderal D272.
- Glycine wightii* (Wight & Arn.) Verdc. ssp. *wightii* (Schweinf.) Verdc.
W. herb per. climber (o) ruderal disturbed ground G11872.
- Indigofera ambelacensis* Schweinf.
W. herb per. (a) ruderal disturbed ground G11821.
- I. arrecta* A. Rich.
F. & W. subshrub (a) ruderal G11229.
- I. colutea* (Burm. f.) Merr. var. *colutea*
W. herb ann. locally (a) ruderal disturbed ground G11241.
- I. costata* Guill. & Perr. ssp. *goniodes* (Bak.) Gillett
W. herb ann. (o) ruderal disturbed ground I1310.
- I. lupatana* Bak. f.
W. & E. herb woody based per. (o) ruderal near hot spring G13234.
- I. schimperi* Jaub. & Spach. var: *schimperi*
P. herb per. (o) granitic rocks MR24297.
- I. schimperi* Jaub. & Spach. var: *baukeana* (Vatke) Gillett
E. herb per. (o) ruderal disturbed ground G11159.
- I. swaziensis* Bolus var: *perplana* (N.E.Br.) Gillett
P. herb woody based per. (o) granitic rocks MR24301.
- I. tinctoria* L.
F. & W. subshrub (a) throughout G11121.
- I. volkensii* Taub.
W. herb scandent (a) ruderal G11307.
- Lonchocarpus eriocalyx* Harms
P. & E. tree (f) in drainage gullies and fire degraded wooded grassland G11058.
- Neorautanenia mitis* (A. Rich.) Verdcort
P. per. tuberous rooted herb with a large tuber, stems several up to 4ft. tall (o) VFG6897.
- Ophrestia hedysaroides* (Willd.) Verdc.
W. herb per. (o) disturbed ground G11156.
- Rhynchosia densiflora* (Roth) DC. ssp. *chrysadenia* (Taub.) Verdc.
E. herb scandent D133.
- R. malacophylla* (Spreng.) Boj.
E. base of rift wall (f) scandent herb in secondary vegetation G12052.
- Rothia hirsuta* (Guill. & Perr.) Bak.
W. herb (o) ruderal disturbed ground G11309.
- Sesbania goetzei* Harms.
Shrub, Maji Moto (r) G13197.
- S. sesban* (L.) Merr. spp. *sesban* var. *nubica* Chiov.
S. shrub (a) river courses G10954.
- Tephrosia elata* Deflers. var. *elata*.
W. herb woody (f) ruderal disturbed ground G11825.
- T. subtriflora* Bak.
E. herb ruderal D131.
- T. uniflora* Pers.
E. & W. herb ruderal D156.
- T. villosa* (L.) Pers. ssp. *ehrenbergiana* (Schweinf.) Brummitt.
W. herb ann. (a) ruderal disturbed ground VFG4866.
- T. villosa* (L.) Pers. var: *incana*.
W. herb ann. (a) disturbed ground G11094.
- Teramus labialis* (L.f.) Spreng. ssp. *arabicus* Verdc.
W. herb climbing (a) G11318.
- Vigna frutescens* A. Rich.
E. herb per. decumbent (f) G11919.
- Vigna frutescens* A. Rich.
E. & W. twining and decumbent per. herb (f) G11919.
- V. luteola* (Jacq.) Benth.
S. herb twining (a) marginal wet places G11839.
- Xeroderris stuhlmannii* (Taub.) Mendonca & E. P. Sousa
E. tree (f) in fire degraded wooded grassland G13196.

165 Ulmaceae F. T. E. A. (1966).

- Celtis africana* Burm. f.
F. tree (f) ground water forest G11138.
C. zenkeri Engl.
E. & F. tree (o) riverine forest G12033.
Chaetacme aristata Planch.
F. tree (f) groundwater forest G13200.
Trema orientalis (L.) Bl.
F. tree (a) groundwater forest G11019.

167 Moraceae Fig family.

- Antiaris toxicaria* (Pers.) Lesch.
F. tree (f) ground water forest G11024; 11369.
Cardiogyne africana Bureau.
W. shrub locally (a) alluvium G10990.
Chlorophora excelsa (Welw.) Benth. & Hook. f. 'Mvule'.
F. tree (r) forest relic much cut formerly G10958.
Dorstenia sp.
E. (riverine) herb D196.
Ficus capensis Thunb.
F. tree (f) ground water forest D387.
F. capraefolia Del.
F. riverine tree; formerly a dominant in thicket Msasa river delta now killed by high lake level G12044.
F. exasperata Vahl
F. tree (o) groundwater forest G12060.
F. glumosa Del.
P. & E. tree (a) rocky places on rift wall VFG6098; 7010.
F. ingens Miq.
E. shrub (f) cliffs G12072.
F. natalensis (Miq.) Hochst.
F. tree (a) groundwater forest G11125.
F. sycomorus L.
F. tree (a) in groups springs and streams throughout groundwater forest G11399.
F. vallis-choudae Del.
F. tree (o) at spring heads G12059.
F. wakefieldii Hutch.
F. tree (f) riverine and gorges in escarpment G11364; 12046.

169 Urticaceae Nettles.

- Fleurya aestuans* (L.) Miq.
F. herb ann. (a) in shade G11192.
Girardinia heterophylla (Vahl) Decne. ssp. *adoensis* (Steud.) Cuf. F. herb in shade D40.
Obetia pinnatifida Bak. Nettle-tree.
E. tree (f) in thicket woodland on steep slopes G11372.

173 Celastraceae

- Hippocratea paniculata* Vahl
F. liane (a) alluvium Endabash G10292; 11346.
Maytenus senegalensis (Lam.) Exell
P. shrub or small tree (a) fire degraded wooded grassland VFG6004; 6909.
Pleurostyhia africana Loes.
P. & E. tree (f) escarpment valleys and granitic rocks brink of rift wall G11848. VFG6904.

179 Icacinaceae

- Apodytes dimidiata* Bernh.
P. tree (f) granitic rock outcrop VFG6005.

180 Salvadoraceae F. T. E. A. (1968).

- Azima tetracantha* Lam.
W. shrub (o) D316.
Salvadora persica L. var. *pubescens* Brenan. Mswaki, 'tooth-brush' brush
W. shrub (va) throughout G10946.

182 **Olacaceae** F. T. E. A. (1968)

- Ximemia americana* L.
E. shrub (f) dry slopes G11013.
X. caffra Sond.
E. shrub D330.

183 **Opiliaceae** F. T. E. A. (1968).

- Opilia campestris* Engl.
E. tree (f) river gorge slopes G11057.
O. celtidifolia (Guill. & Perr.) Walp.
W. liane (o) base of rift wall G11037.

185 **Loranthaceae** Mistletoe family.

- Erianthemum ulugurense* (Engl.) Danser var. *foliaceum* (Sprague) Balle
F. parasite on *Trichilia* G11261.
Helixanthera kirkii (Oliv.) Danser.
F. & W. parasite on *Grewia* and *Cordia* G11187.
Loranthus (Tapinanthus) oehleri Engl.
E. parasite on *Euphorbia heterochroma* and *E. tirucalli* G13238.
Odontella fischeri (Engl.) Balle
E. parasite on *Thylachium* G11402.
Plicosepalus curviflorus (Benth.) Van Tiegh
W. parasitic on *Acacia tortilis* ssp. *spirocarpa* G10971.
Tapinanthus sansibarensis (Engl.) Danser var. *kendelii* (Engl.) Balle
E. parasitic shrub (o) VFG6898.
Tapinanthus sp.
E. parasite on *Euphorbia* G12895.
Tapinostemma acaciae (Zucc.) Van Tiegh.
E. parasitic (o) VFG6007.

186 **Santalaceae** Sandalwood family.

- Osyridicarpus schimperanus* (Hochst.) A.DC.
E. scandent (o) bush group thickets fire-degraded wooded grassland crested of rift wall
VFG6102.
Osyris compressa (Berg.) A.DC.
E. shrub or small tree (o) on crest of rift wall G11175.

190 **Rhamnaceae** Cascara, Christ's thorn.

- Helinus integrifolius* (Lam.) Kuntze var. or hybrid with *H. mystacinus* (Ait.) Steud.
E. & W. liane (o) throughout G11260.
Ventilago diffusa (G. Don) Exell
E. & W. liane (f) riverine G11190; 11018.
Ziziphus mucronata Willd.
W. tree (f) riverine G11325.
Z. pubescens Oliv.
F. & W. tree (va) riverine alluvium G10991.

193 **Vitaceae** Vine family.

- Cissus petiolata* Hook. f.
F. liane (o) in groundwater forest G12039.
C. rotundifolia (Forsk.) Vahl
P. herb scandent succulent (f) relict thicket among granitic boulders VFG7016.
C. quadrangularis L.
P. & E. liane (a) thicket woodland and granitic rocks G11274.
Cyphostemma cyphopetalum (Fresen.) Wild & Drum.
E. vine (f) G12027.
Rhoicissus tridentata (L.f.) Wild & Drum.
E. liane with 3-foliolate leaves, on granite boulders, locally (f) VFG7015.

194 **Rutaceae** Orange (*Citrus*) family.

- Clausena anisata* (Willd.) Benth.
E. shrub (f) top of rift wall among granitic boulders D389. VFG7004.
Fagara chalybea (Engl.) Engl.
P. & E. tree (f) in thicket woodland and rock groups G12023.

Toddalia asiatica (L.) Lam.

F. (riverine) liane. Sight record.

Vepris uguenensis Engl.

E. & W. shrub (a) throughout in understory G11046; 11047.

195 Simaroubaceae

Harrisonia abyssinica Oliv.

P. & E. shrub locally (a) on rift wall G10987.

195A Balanitaceae Desert date.

Balanites aegyptiaca (L.) Del.

W. tree often co-dominant with *Acacia tortilis* throughout G10948.

196 Burseraceae Myrrh

Commiphora africana (A. Rich.) Engl.

P. small tree (a) stony ridges fire subclimax open woodland VFG6002; 7005.

C. baluensis Engl.

E. tree (a) in thicket woodland G11154.

C. campestris Engl.

E. tree (o) in thicket woodland G11059.

C. engleri Guill.

E. tree (a) in thicket woodland G11011. VFG 7007.

C. madagascariensis Jacq.

E. tree (f) in thicket woodland G11408.

C. schimperi (Berg.) Engl.

P. & E. tree (a) in thicket woodland and fire degraded wooded grassland G11185.

C. zimmermannii Engl.

E. tree (o) in thicket woodland G13237.

197 Meliaceae

Ekebergia capensis Sparrm.

F. tree locally (f) riverine G12043.

Trichilia roka (Forsk.) Chiov.

F. tree (va) a dominant in groundwater forest and riverine G11126.

198 Sapindaceae

Allophylus africanus Beauv.

P. & E. small tree to 5m or fire scorched coppice growth (va) VFG6891.

A. rubifolius (A. Rich.) Engl.

F. tree or shrub (a) riverine and understory groundwater forest G11227; 11826.

Blighia unijugata Bak.

F. tree (o) riverine G11041.

Cardiospermum halicacabum L.

W. vine (o) marginal areas G11288.

Pappea capensis (Spreng.) Eckl. & Zeyh.

P. tree occurring crest of rift wall fire-degraded wooded grassland VFG5997; 7003.

Zanha golungensis Hiern

F. tree (f) in groundwater forest G11045.

205 Anacardiaceae

Heeria reticulata (Oliv.) Engl.

P. & E. small tree (a) crest of rift wall and fire-degraded wooded grassland VFG6895.

Lanmea stuhlmannii (Engl.) Engl.

E. tree (a) crest of rift wall G12057.

Rhus natalensis Krauss

P. shrub (a) ridges and among boulders D329.

R. vulgaris Meikle

P. shrub or small tree (f) rocky ridges VFG5998.

Sclerocarya birrea (A. Rich.) Hochst.

E. tree (a) crest of rift wall valleys and hillsides fire-degraded woodland G11155.

Sorindeia madagascariensis DC.

F. (riverine) tree D359.

213 Umbelliferae Parsley family

- Berula erecta* (Huds.) Cav.
S. herb per. aquatic (a) springs and streams G10960.
- Cemella asiatica* (L.) Urban
S. herb per. aquatic (a) stream sides and wet mud G11115.
- Heteromorpha trifoliata* (Wendl.) Eckl. & Zeyh.
E. shrub (f) rocky sites D318.
- Hydrocotyle ranunculoides* L.f.
S. herb per. aquatic (a) G11341.
- Steganotaenia araliacea* Hochst.
E. shrub or small tree (o) D331.

221 Ebenaceae Ebony

- Diospyros abyssinica* (Hiern) F. White
F. tree (o) riverine G11044.
- Euclea divinorum* Hiern
E. F. tree (f) G11806. VFG7009

222 Sapotaceae F. T. E. A. (1968). Gutta-percha tree.

- Mimusops kummel* A.D.C.
F. tree (r) riverine G11876.

228 Loganiaceae F. T. E. A. (1960)

- Nuxia oppositifolia* (Hochst.) Benth.
E. tree (o) riverine G11823.
- Strychnos lucens* Bak.
F. liane (f) riverine G11022. D377.
- S. mitis* S. Moore
F. tree (f) riverine G11867.
- S. potatorum* L. f.
E. tree (f) foot of rift wall south of Maji Moto G12074.

229 Oleaceae F. T. E. A. (1952). Jasmine.

- Jasminum fluminense* Vell. ssp. *holstii* (Gilg) Turril
F. liane (o) riverine G11836.

230 Apocynaceae Frangipani family.

- Landolphia? buchananii* (Hall.f.) Stapf
E. (river gorge) liane D367.
- Rauwolfia caffra* Sond.
F. tree (a) in groundwater forest G10996.
- Saba florida* (Benth.) Bullock
E. shrub river gorge D368.
- Tabernaemontana usambarensis* K. Schum.
F. tree (va) in ground water forest G1029B; 10965.

231 Asclepiadaceae Milk weeds.

- Calotropis procera* (Ait.) Ait.
Shrub (o) on disturbed ground in dry drainage lines G10969.
- Caralluma dummeri* N. E. Br.
E. herb succulent (o) open places G11103.
- C. speciosa* (N.E.Br.) N.E.Br.
E. herb succulent (r) open rocky places in thicket woodland G13244.
- Ceropegia ballyii* Bullock
E. succulent vine (f) deciduous thicket woodland G11065; 11137.
- Cynanchum hastifolium* N.E. Br.
W. vine (o) riverine G11282.
- C. tetrapterum* (Turcz.) R.A. Dyer
E. vine succulent (f) in thicket woodland G12022.
- C. validum* N.E.Br.
E. liane (o) G11012.
- Dregea abyssinica* (Hochst.) K. Schum.
F. liane (o) G11043.

- Duvalia tanganyikensis* Bruce & Bally
 F. riverine herb succulent and procumbent sandy redistributed soil G11414.
Pachycarpus schweinfurthii (N.E.Br.) Bullock
 P. & E. Per. tuberous rooted herb on fire denuded hillside (o) VFG6908.
Parquetina nigrescens (Afz.) Bullock
 E. liane (o) thicket woodland G12073.
Pentarrhinum insipidum E. Mey.
 W. vine (o) in *Acacia*-bush group woodland G11275; 11286.
Pentatropis spiralis (Forsk.) Decne.
 W. & E. vine (o) G11273; 12041.
Secamone stenophylla K. Schum.
 E. vine (o) in thicket woodland G12081. D354.

232 Rubiaceae Coffee family.

- Arbulocarpus sphaerostigma* (A. Rich.) Tennant
 W. herb ann. (o) on disturbed ground redistributed soil G11267; 11393.
Canthium setiflorum Hiern
 E. shrub (f) woodland thicket rift wall G12088.
Gardenia jovis-tonantis (Welw.) Hiern
 W. shrub (a) riverine and gullies G10970.
Kohautia caespitosa Schinz var. *amamiensis* (K. Schum.) Brem.
 W. herb ann. (o) ruderal disturbed ground ecotones G11246.
K. coccinea Royle
 E. herb top of rift wall (r) D143.
K. lasiocarpa Kl.
 F. herb (a) on soda flats D239.
Oldenlandia fastigiata Brem.
 E. herb ann. (f) ruderal disturbed ground alluvium G11248.
O. somala Chiov.
 F. herb soda flats N.E. lake D238.
Pavetta dolicantha Brem.
 E. shrub D127.
P. scandens Brem.
 F. shrub (o) understorey groundwater forest G12096.
P. subcana Hiern
 E. shrub (o) understorey drainage lines G11829.
Pentanisia ouranogyne S. Moore
 E. herb per. (f) degraded vegetation on slopes G12056.
Pentodon pentander (Schum. & Thonn.) Vatke
 S. herb semi aquatic D17.
Rubia cordifolia L.
 P. & E. many stemmed scandent asperous herb per. (r) VFG7011.
Rytigynia sp.
 E. shrub (f) thicket woodland G11134; 13231.
Tarenna graveolens (S. Moore) Brem.
 E. & W. shrub (f) drainage lines and woodland thicket on rift wall G11088; 12077.
Vangueria acutiloba Robyns.
 W. shrub (a) understorey riverine to edges of swamp G10296.

238 Compositae

- Acanthospermum hispidum* DC.
 Herb ann. ruderal on waste ground G13236.
Adenostemma perrottii DC.
 S. herb ann. (f) ruderal G10961.
Ageratum conyzoides L.
 W. herb ann. (a) ruderal disturbed places G10957.
Anisopappus holstii (O. Hoffm.) Wild
 W. herb ann. (o) ruderal D306.
Aspilia mossambicensis (Oliv.) Wild
 W. herb becoming woody based per. (o) ruderal G11338.
Athroisma hastifolium Mattf.
 E. herb ann. (o) badly drained black soil G11173.
Bidens pilosa L.
 W. herb ann. (a) ruderal disturbed ground G11331.
B. schimperi Sch. Bip.
 W. herb ann. (a) seral vegetation G11804.
Blumea aurita (L.f.) Wight
 F. herb ann. (o) ruderal G12020.

- Conyza aegyptiaca* (L.) Ait.
F. (Clearings) herb (f) ruderal D218; 226.
- C. bonariensis* (L.) Cronq.
W. herb ann. (f) ruderal redistributed and disturbed soil G12051.
- Crassocephalum bojeri* (DC.) Robyns
W. riverine herb per. scandent succulent D119.
- C. picridifolium* (DC.) S. Moore
F. herb per. (f) seral in clearings G11023.
- Dicoma tomentosa* Cass.
E. herb ann. (f) seral on redistributed soil G11205.
- Eclipta prostrata* (L.) L.
W. herb ann. (o) ruderal on alkaline soil G11272.
- Emilia coccinea* (Sims) Sweet
F. & W. herb ann. ruderal open sites D245.
- Enydra fluctans* Lour.
S. herb per. (a) in pools G12065.
- Epaltes alata* (Sond.) Steetz.
W. herb ann. (f) ruderal sandy places G11238.
- Erlangea cordidifolia* (Benth.) S. Moore
W. & E. herb ann. (f) ruderal G11917.
- Galinsoga parviflora* Cav.
W. herb ann. (o) widespread ruderal G11314.
- Gnaphalium luteo-album* L.
E. herb per. (o) crest of rift wall G11830.
- Helichrysum glumaceum* DC.
W. herb per. (o) ruderal G11895.
- Hirpicium diffusum* (O. Hoffm.) Roess.
F. herb D235.
- Melanthera scandens* (Schum. & Thonn.) Roberty ssp. *madagascariensis* (Bak.) Wild
F. herb per. (a) open places in river fringe G10976.
- Microglossa oblongifolia* O. Hoffm.
E. shrub (f) secondary in thicket-woodland G11009.
- M. pyrifolia* (Lam.) O. Ktze.
F. herb D326.
- Mikania cordata* (Burm.f.) B.L. Rob.
F. herb scandent locally (a) secondary in clearings G11913.
- Nidorella pedunculata* Oliv. & Hiern
E. herb D227.
- Notomia abyssinica* A. Rich.
E. herb succulent perennial (o) in thicket G11852.
- N. coccinea* Oliv. & Hiern
P. & E. per tuberous rooted herb with fleshy fusiform leaves, scattered in fire-degraded wooded grassland (f) VFG6960.
- Pluchea bequaertii* Robyns
W. shrub (o) ecotones alkaline soil G10984.
- P. dioscoridis* DC.
W. shrub (a) ecotones alkaline soil G10968.
- P. nitens* O. Hoffm.
W. herb ann. (o) ruderal redistributed soil G11233.
- P. ovalis* DC.
W. shrub (a) secondary riverine G11897.
- P. sordida* (Vatke) Oliv. & Hiern
F. shrub D339.
- Porphyrostemma grantii* Benth.
A. herb on soda flats D237.
- Senecio coronopifolius* Desf.
W. herb (f) ruderal D225B.
- S. petitianus* A. Rich.
E. shrub scandent in woodland thicket D371.
- Sonchus asper* (L.) Hill
W. herb ann. (o) ruderal disturbed places G11333.
- Sphaeranthus bullatus* Mattf.
W. herb ann. (a) ruderal rocky gorge G10956.
- S. cyathuloides* O. Hoffm.
W. herb ann. (o) ruderal disturbed ground edges dry pools G11321.
- S. suaveolens* (Forsk.) DC.
W. herb ruderal D23.
- S. ukambensis* O. Hoffm.
W. herb per. (va) ruderal in ecotones and derived grassland G10989.

Spilanthes mauritiana (Pers.) DC.

S. herb (f) secondary sites with high water table G11025.

Tagetes minuta L.

W. herb ann. widespread alien (va) disturbed places G11377.

Tridax procumbens L.

W. herb per. (o) ruderal dry river bed and disturbed ground G11095.

Vernonia brachycalyx O. Hoffm.

E. shrub scandent (f) secondary in ecotones G11858.

V. cinerascens Sch. Bip.

P.E. & W. shrub (a) seral vegetation dry places G11160.

V. grantii Oliv.

E. shrub (o) seral rocky places dry river bed G11817.

V. pauciflora Less.

E. herb (f) secondary vegetation G11413.

V. peculiaris Verdc.

E. & W. herb ann. (f)-(a) seral secondary vegetation G11890.

V. stenolepis Oliv.

F. herb (o) in clearings G11302.

V. tephorodes A. Peter in ed.

E. herb per. locally (f) edges of escarpment woodland G11851.

239 **Gentianaceae** Gentian family.

Emicostema hyssopifolium (Willd.) Verdoorn

W. herb per. (f) ecotones between woodland and alkaline soils G11284.

241 **Plumbaginaceae** Plumbago family.

Plumbago zeylanica L.

F. herb (f) margins and clearings G11374.

244 **Lobeliaceae** Lobelia family.

Cyphia glandulifera A. Rich.

W. herb per. (o) ecotones and redistributed soil G11142.

249 **Boraginaceae** Borage family.

Cordia africana Lam.

F. tree (a) in ground-water forest G12091.

C. goetzei Guerke

W. shrub or tree (va) especially alluvium G11228.

C. ovalis R.Br.

W. shrub (va) throughout G11079.

C. sinensis Lam.

W. shrub or tree (va) especially alluvium G11186.

Ehretia amoena Klotzsch (Syn. *E. stulmannii* Guerke).

F. small tree occurring near springs D58.

E. obtusifolia DC.

E. shrub (f) thicket woodland on steep slopes G10986; 11056.

Heliotropium subulatum (DC.) Martelli.

W. herb per. (a) ruderal G11072.

Trichodesma zeylanicum (L.) R.Br.

E. herb ann. (o) ruderal G11092.

250 **Solanaceae** Potato family.

Capsicum annum L.

F. herb ann. (o) casual G11833.

Datura stramonium L.

W. herb ann. (f) ruderal G11315.

Lycopersicum Esculentum Mill.

W. herb ann. (o) ruderal disturbed ground G11334.

Nicandra physaloides (L.) Gaertn.

W. herb ann. (o) ruderal G11396.

Physalis micrantha Link.

W. herb ann. (o) ruderal G11197.

Solanum dasyphyllum Thonn.

F. herb ann. (o) casual G11109.

S. incanum L.

W. herb woody (va) ruderal throughout G11158.

- S. nigrum* L.
W. & F. herb ann. (f) ruderal G11113.
S. renschii Vatke
E. shrub (o) ruderal D321.
S. setaceum Dammer
W. herb per. (f) ruderal in ecotones G11031.
Withania somnifera (L.) Dunal
W. herb (f) ruderal secondary vegetation G11040.

251 Convolvulaceae F. T. E. A. (1963) Bindweed, Dodder and Morning Glory family

- Astripomoea malvacea* (Kl.) Hall. f. var. *floccosa* (Vatke) Verdcort
P. & E. several stemmed per. herb with discolorous leaves (o) G. EAH. 13248; VFG6905.
Cuscuta kilimanjari Oliv.
F. herb parasite on *Hypoestes* D28.
Evolvulus alsinoides (L.) L.
E. herb (o) G11868.
Hewittia sublobata (L.f.) O. Ktze.
F. herb twining per. (f) open places G10963.
Impomoea arachnosperma Welw.
F. herb twining groundwater forest clearing D203.
I. cairica (L.) Sweet
F. herb climber per. (f) wet clearings G10978.
I. coptica (L.) Roem. & Schult. var. *coptica*.
W. herb ann. prostrate (o) in thicket G11279.
I. hildebrandtii Vatke ssp. *hildebrandtii*.
W. herb per. (r) casual G11908.
I. kituiensis Vatke var. *masaiensis* (Pilg.) Verdc.
W. herb twining (o) riverine D117.
I. mombassana Vatke
W. herb twining (o) riverine D185.
I. nil (L.) Roth
F. vine (a) forest clearings G11191.
I. obscura (L.) Ker-Gawl. var. *obscura*.
F. herb twining (o) secondary vegetation G11912.
I. sinensis (Desr.) Choisy ssp. *blepharosepala* (A. Rich.) Meeuse .
W. herb twining D184.
I. spathulata Hall.f.
E. vine (o) secondary thicket woodland at foot of rift wall G11259. (An intermediate specimen between *I. kituiensis* and *I. spathulata*.)
Stictocardia incomta (Hall.f.) Hall.f.
F. vine (o) secondary vegetation G10983.
Turbina stenosphon (Hall.f.) Meeuse var. *stenosphon*.
W. vine (f) in river fringes G11215.

252 Scrophulariaceae

- Alectra kirkii* Hemsl.
E. herb parasite on grasses G13253.
A. vogelii Benth.
E. herb parasitic (f) G12935; 12936.
Buttoma hildebrandtii Engl.
E. shrub scandent (o) thicket woodland G11082. VFG5436.
Craterostigma plantagineum Hochst.
E. herb per. (f) special sites open places G11078.
Rhamphicarpa heuglinii Hochst.
W. herb per. (o) grass sward ecotones G11007.
Striga asiatica (L.) O. Ktze.
W. herb parasite (a) ruderal fallows and waste places G11305.
S. gesneroides (Willd.) Vatke
E. herb parasite (o) ruderal G11870.
Veronica anagallis aquatica L.
W. herb ann. (o) dry season wet site in river bed VFG6429.

253 Orobanchaceae F. T. E. A. (1957) Broomrape.

- Cistanche tubulosa* (Schenk) Hook.f.
W. herb parasite (o) ecotones and elsewhere G11877.

257 Bignoniaceae

- Kigelia africana* (Lam.) Benth. Sausage-tree.
P.W. & F. tree (a) groundwater forest and riverine G11360.
Stereospermum kunthianum Cham.
E. tree. Sight record.

258 Pedaliaceae F. T. E. A. (1953)

- Ceratotheca sesamoides* Endl.
E. herb ann. (o) ruderal G11802.
Sesamum angustifolium (Oliv.) Engl.
W. herb (f) ruderal secondary vegetation G11298.

259 Acanthaceae Acanthus family.

- Asystasia gangetica* (L.) T. Anders.
F. herb semi-scandent (a) shade undergrowth and in clearings G11914.
A. schimperi T. Anders.
W. herb ann. (o) ruderal G11296.
Barleria eranthemoides C.B.Cl.
E. & W. herb woody (a) widespread G11208.
B. submollis Lindau
E. & W. herb woody and scandent (f) seral G11375.
B. volkensii Lindau
E. herb scandent per (o) seral rocky places G11801.
Blepharis maderaspatensis (L.) Roth
W. herb procumbent or scandent (o) ruderal G11281.
Crabbea velutina S. Moore
E. herb per. (o) ruderal ecotones G11857.
Dyschoriste procumbens E.A. Bruce
E. herb woody per. (a) ruderal upper parts of rift wall G11405.
Ecbolium revolutum (L.) C.B.Cl.
E. herb woody per. (a) secondary vegetation G11401.
Hypoestes verticillaris (L.f.) R.Br.
F. herb per. (a) shade undergrowth G12093.
Isoglossa ovata E.A. Bruce
W. herb per. (a) ruderal in thickets G12099.
Justicia betonica L.
W. herb per. (a) ruderal G11411.
J. caerulea Forsk.
W. herb per. (o) ruderal in ecotones G11907.
J. cordata T. Anders.
W. shrub (va) throughout Acacia-bush group woodland G11122.
J. exigua S. Moore
W. herb per. ruderal D212.
J. fischeri Lindau
W. herb woody (a) ruderal G11129.
J. flava Vahl
W. herb per. (f) ruderal ectotones G11813.
J. glabra Roxb.
W. herb per. (a) in field layer seral G11258.
J. heterocarpa T. Anders.
W. herb ann. (o) ruderal disturbed ground G11335.
J. nyassana Lindau
F. herb (f) floor shade and clearings G11915.
J. striata (Klotzch) Bullock
W. herb per. (a) ruderal G11886.
Lipidagathis scabra (Lindau) C.B.Cl.
W. herb per. (o) in field layer seral G12094.
Monechma debile (Forsk.) Nees
W. herb ann. (a) in field layer seral G12083.
Neuracanthus sp.
E. herb per. (r) seral G11406.
Peristrophe bicalyculata Nees
W. herb ann. (a) in field layer seral G11234.
Phaulopsis imbricata (Forsk.) Sweet
F. herb per. (f) semi-shaded undergrowth G11916.

- Pseuderanthemum hildebrandtii* (Lindau) C.B.Cl.
 F. shrub locally (a) shaded undergrowth G11199.
Ruellia megachlamys S. Moore
 W. small shrub per. (va) throughout G11071.
R. prostrata T. Anders.
 F. & W. herb woody per. seral (a) in ecotones G11290.
Ruttya fruticosa Lindau
 E. shrub locally (a) rocky places G12087.
Thunbergia alata Sims
 F. & W. herb climber (f) secondary sites D279.

263 **Verbenaceae** Verbena family

- Clerodendrum rotundifolium* Oliv.
 F. shrub (f) secondary vegetation G12098.
Lantana rhodesiensis Moldenke
 E. shrub (f) ruderal ecotones and secondary vegetation G11850.
L. viburnoides (Forsk.) Vahl
 E. shrub (a) ruderal in secondary vegetation G11090. VFG7020.
Lippia javanica (Burm.f.) Spreng.
 W. & F. shrub (f) ruderal invading secondary vegetation D327. VFG7019.
Phyla nodiflora (L.) Greene
 S. herb per. (f) locally in wet places G12062.
Premna senensis Klotzch
 W. shrub (f) bush-groups and riverine G11061.
Priva cordifolia (L.) Druce var. *flabelliformis* Moldenke
 W. herb woody (a) ruderal G11119.
Vitex mombassae Vatke
 P. small tree (f) rocky hillsides fire subclimax open woodland VFG6001.

264 **Labiatae** Mint family.

- Becium kenyanum* (Vatke) G. Taylor.
 W. herb woody (a) ruderal G11003.
Coleus ignirius Schweinf.
 E. shrub semi-scandent (a) rocky places thicket-woodland G11083. D291.
C. lasianthus Guerke
 E. herb per. succulent locally (a) in thicket woodland G11923.
C. spicatus Benth.
 W. herb D202.
Englerastrum sp. A of Upland Flora.
 E. many stemmed succulent shrub with bright blue flowers (fo) G11151; 11295. VFG7013.
Hoslundia opposita Vahl
 W. & F. shrub (a) ruderal invading secondary vegetation G10981.
Hyptis pectinata Poit.
 F. herb per. (o) ruderal G11217.
Iboza multiflora (Benth.) E.A. Bruce
 E. herb D304.
Leonotis africana (P. Beauv.) Briq.
 E. & W. herb widespread ruderal D88A.
L. nepetifolia (L.) Ait.f.
 W. herb ann. (a) ruderal disturbed ground G11879.
Leucas glabrata R.Br.
 W. herb per. (a) ruderal ecotones G11144.
L. neuflyzeana Courb.
 F. herb ruderal D244.
Osimum suave Wild.
 W. shrub (va) ruderal invading secondary vegetation throughout especially deltas G11073.
Orthosiphon parvifolius Vatke
 W. herb D251; 355.
O. suffrutescens (Thonn.) Morton
 W. herb woody (a) ruderal throughout G11002; 11062.
Placranthus flaccidus (Vatke) Guerke
 W. herb ann. (a) ruderal disturbed ground G11330.
P. parvus Oliv.
 W. herb D277.
Tinnea aethiopica Kotschy & Peyr.
 E. herb woody D370.

MONOCOTYLEDONS

280 Commelinaceae

- Aneilema aequinoctiale* (P. Beauv.) Kunth
E. herb D183.
A. petersii (Hassk.) C.B.Cl.
W. herb per. semi-scandent (f) riverine sites G11871.
Commelina africana L. var. *diffusa* Brenan
W. herb per. (a) ruderal disturbed ground G11400.
C. albescens Hassk.
W. herb per. (o) ruderal G11098.
C. benghalensis L.
F. herb per. (a) ruderal clearings G11218.
C. foliacea Chiov.
W. herb per. (a) ruderal G11074.
C. imberbis Hassk.
E. herb per. (a) ruderal G11161.

290 Zingiberaceae Ginger family.

- Fromomum angustifolium* (Sonn.) K. Schum.
F. herb per. locally (a) understorey ground-water forest wet place in shade G10298.

293 Liliaceae Lilies.

- Aloe ballyi* Reynolds
E. small tree with slender trunk (a) gregarious rocky places and cliffs G11776.
A. secundiflora Engl.
W. herb succulent (o) colonies in special sites G12097.
Aloe sp.
E. herb succulent (o) local groups rocky places G11854.
Asparagus africanus L.
E. herb scandent D50.
A. aethiopicus L. var. *angusticladus* Jessop
E. herb scandent (a) thicket-woodland G11410. D126.
A. setaceus (Kunth) Jessop
W. & F. herb per. scandent (a) throughout G11107. D43.
Dipcadi viride (L.) Moench.
W. & E. herb bulb (a) redistributed soil G11101; 11775.
Drimiopsis volkensii Bak.
E. herb bulb (o) G11105.
Gloriosa Superba L.
W. herb per. climber (r) G11814.
Ornithogalum longibracteatum Jacq.
W. herb bulb (o) G12937.
Scilla indica Bak.
E. herb bulb (f) local rock shelf G11064.
S. kirkii Bak.
E. herb bulb (f) local rock shelf G11064; 11168.
Urginea sp.
W. herb bulb (o) disturbed areas G11099.

296 Pontederiaceae F. T. E. A. (1968).

- Heteranthera callifolia* Kunth
S. herb per. (o) pools and mudholes G11257.

302 Araceae Aroids.

- Pistia stratiotes* L.
S. herb floating (a) on water in pools and lagoons G11340.

303 Lemnaceae Duck-weeds.

- Lemna minor* L.
S. herb (a) floating still pools G11066.
Spirodela polyrrhiza (L.) Schleid.
S. herb (f) floating still pools G11342.
Wolffia repanda Hegelmaier
S. herb (a) floating still pools G11807.

305 Typhaceae F. T. E. A. (1971) Reed mace.

Typha dominaensis Pers.

S. herb (reed-like) (va) locally dominant where perennial rivers enter lake G11834.

306 Amaryllidaceae Amaryllis

Ammocharis tinneanus (Kotsch. & Peyr.) Milne-Redh. & Schweick.

E. herb bulb (f) badly drained shelf G13254.

Boophae disticha (L.f.) Herb.

P. bulbous perennial herb with an enormous bulb, leaves strap-shaped distichus, flowers dark red in a large globose head (o) VFG7017.

Haemanthus multiflorus Martyn.

F. herb bulb (f) groups in shaded understorey G10980.

313 Agavaceae

Sansevieria braunii Engl. & Kraus

E. herb per. succulent (o) D197 (sterile specimen and doubtful if correctly determined).

S. ehrenbergiana Bak.

E. herb per. succulent (va) in groups thicket woodland. Sight record.

314 Palmae Palms.

Elaeis guineensis Jacq. Oil palm.

F. palm sight record (Shimba river).

Hyphaene ventricosa Kirk Doumpalm.

W. palm (f) but very patchily distributed G10998.

Phoenix reclinata Jacq. Wild date palm.

F. palm (a) growing in clumps riverine and where high water table G11069.

326 Orchidaceae Orchids.

Ansellia gigantea Reichb. f. var. *nilotica* (Bak.) Summerh.

E. & F. epiphyte (f) often on baobab D383.

Eulophia orthoplectra (Reichb.f.) Summerh.

E. terrestrial (f) in thicket woodland G11167.

E. wakefieldii (Reichb. & S. Moore) Summerh.

E. terrestrial (o) G11133.

331 Cyperaceae Sedges.

Cyperus alternifolius L. ssp. *flabelliformis* (Rottb.) Kukenth.

F. herb per. gregarious (va) springs swamp edges and shade along streams G11865.

C. amabilis Vahl

W. herb ann. (a) ruderal disturbed ground G11308.

C. articulatus L.

S. herb (rush-like) (a) in groups swampy and boggy sites G10997.

C. difformis L.

S. per. tussock (f) wet ground VFG6507.

Cyperus distans L.f.

P.E. per. culms to 90 cm. bunch growth from fibrous roots with tubers (o) in stormwater channel, VFG. 7018.

C. immensus C.B.Cl.

S. herb per. (tussock-growth) (va) seasonally wet sites G10974.

C. laevigatus L. (Syn. *Juncellus laevigatus* (L.) C.B.Cl.).

S. (alkaline) herb per. (va) a dominant lake shore and alkaline bogs G11010.

C. latifolius Poir.

S. per. special site spring-head bog VFG6433.

C. longus L. ssp. *tenuiflorus* (Rottb.) Kukenth.

S. herb per. (f) boggy sites G11028.

C. merkeri C.B.Cl.

S. per. special site spring-head bog VFG. 6434.

C. obtusiflorus Vahl

W. herb per. (f) ruderal disturbed silt G11093.

C. rotundus L.

F. & W. herb per. (f) ruderal wet places and ecotones G11145. VFG6885.

C. schimperianus Steud.

W. per. rhizomatous (o) wet sand in river bed VFG6367.

C. teneriffae Poir.

W. herb ann. (f) ruderal ecotone and lake shore G11117.

- Fimbristylis exilis* (H.B. & K.) Roem. & Schult.
W. herb ann. (f) ruderal disturbed sandy ground G11301.
- F. ovata* (Burm. f.) Kern
P. per. bulbous based (o) fire subclimax wooded grassland VFG6101.
- Fuirena leptostachya* Oliv.
S. herb (o) ruderal special sites seasonally wet sand G11269.
- F. pubescens* (Lam.) Kunth
S. herb per. (a) wet ground perimeter of swamps G11026.
- Kyllinga alba* Nees.
E. herb per. (o) rocky pavement G11100.
- K. oblonga* C.B.Cl.
W. herb per. (a) ecotones in woodland and along lake shore G11075.
- Kyllinga* sp.
W. herb ann. locally (f) ecotones lake shore G11076.
- Mariscus assimilis* (Steud.) Podl.
S. ann. tussock herb, (o) on wet sandbanks, G11268.
- M. dubius* (Roth.) Hutch.
P. & E. per. (o) dry ledges VFG6979.
- M. leptophyllus* C.B.Cl.
E. herb per. (o) rocky places and dry ledges G11362. VFG 6979.
- M. procerus* A. Rich.
E. caespitose per. culms bulbous-based in small colonies between stones (o) burnt hill-sides VFG6899; 7008.
- M. pseudovestitus* C.B.Cl.
P. E. per culm bases 3-angular caespitose inflated and growing in drypapery leaf bases VFG6979.
- M. vestitus* (Krause) C.B.Cl.
E. per. growing in a dense clump, culm bases swollen and covered with dense brown fibrous leaf bases (o) VFG6888.
- M.* sp. aff. *M. taylori* C.B.Cl. (=A.B. 3402 in E.A. Herb.).
E. per. rhizomatous (f) secondary sites in thicket woodland VFG6505.
- Pycreus elegantulus* (Steud.) C.B.Cl.
S. herb per. special sites damp places (o) VFG6428.
- P. mundtii* Nees
S. herb per. (a) sward forming boggy places G11344.

331 **Gramineae** F. T. E. A. Part 1 (1969). Grasses of Tanganyika by D. M. Napper (1965).

- Andropogon pratensis* Hack.
per. casual river bed G11395. (f) fire subclimax grassland on rift wall VFG6094.
- A. schinzii* Hack.
P. per. fire-induced woodland grassland (a) on hillside VFG6958.
- Aristida adscensionis* L.
W. & E. ann. locally (a) ruderal sandy and stony ground, disturbed and degraded places G11203; 11388.
- A. mutabilis* Trin. & Rupr.
W. ann. (o) ruderal disturbed places G11381.
- Bothriochloa insculpta* (A. Rich.) A. Camus
W. & E. per. casual river bed G11149.
- B. radicans* (Lehm.) A. Camus
E. per. (f) secondary grassland badly drained sites G12045.
- Brachiaria deflexa* (Schumach.) C.E. Hubb.
F. ann. seral and ruderal G11166.
- B. leersioides* (Hochst.) Stapf
E. (o) ruderal roadsides (this specimen a stoloniferous perennial, plant 'mealy') VFG5321.
- Cenchrus ciliaris* L.
W. & E. per. branched tussock grass (a) seral and disturbed ground throughout G11120.
- Chloris gayana* Kunth
W. per. tussock grass (va) badly drained soils, ecotone between alkaline grassland and woodlandforest G11141.
- C. pycnothrix* Trin.
W. ann. (a) seral sandy soils, ruderal disturbed ground G11382.
- C. roxburghiana* Schult.
W. per. tussocks, culms branched and cane-like (va) sometimes co-dom, secondary/seral sites G11089.
- C. virgata* Sw.
W. ann. (a) seral/ruderal, in ecotones G11239.
- Cymbosetaria sagittifolia* (A. Rich.) Schweick.
W. ann. (f) ruderal disturbed sites in shade G11196.

- Cymbopogon excavatus* (Hochst.) Stapf
W. per. casual river bed G11874.
- Cynodon dactylon* (L.) Pers.
W. F. & A. per. (va) dom. on alluvial clay, clay-loams and sand where high water-table;
pasture green all months G11140.
- C. plectostachyus* (K. Schum.) Pilg.
W. per. (va) dom. compacted sand and detritus G12082.
- Cypholepis yememica* (Schweinf.) Chiov.
E. per. locally (f) ledges G13235.
- Dactyloctenium aegyptium* (L.) Beauv.
W. ann. (f) ruderal/seral G11237.
- Digitaria milaniana* (Rendle) Stapf
W. per. (a) perimeter grassland, ecotones G12078.
- D. secalarum* (Schweinf.) Chiov.
W. & F. per. (va) co-dom. clay and silt, disturbed sites G12090.
- D. setivalva* Stent
W. per. (f) casual secondary sites, river bed G11276.
- D. velutina* (Forsk.) Beauv.
W. ann. (a) ruderal G12086.
- Diplachne fusca* (L.) Beauv.
A. per. locally (f) in wet mud-holes and channels G11232.
- Echinochloa colomum* (L.) Link.
S. & W. ann. rainwater pools, wallows PKG22.
- E. haploclada* (Stapf) Stapf.
ann./per. locally dom. in rainwater pools and other temporary wet places G11808.
- E. pyramidalis* (Lam.) Hitchc. & Chase.
S. per. semi-aquatic locally (f)-(a) G11838.
- Eleusine indica* (L.) Gaertn.
ann. ruderal and casual river bed G11251.
- Erneapogon cenchroides* (Roem. & Schult.) C.E. Hubb.
W. & E. ann./per. (a) stony/sandy sites G11169; 11203.
- Enteropogon macrostachyus* (A. Rich.) Benth.
W. & E. per. (a) throughout seral in secondary sites G11336.
- Eragrostis aethiopica* Chiov.
W. & E. ann. (a) ruderal throughout G11861.
- E. aspera* Nees
W. ann. (a) ruderal throughout G11379.
- E. cilianensis* (All.) Lutati
W. ann. (f) river bed sand banks and ruderal throughout G11226.
- E. superba* Peyr.
W. & E. per. secondary (fire degraded) grassland (a) also ruderal G11150.
- Eriochloa nubica* (Steud.) Hack. & Stapf
W. ann. (f) water-holes and swamp edges G11809.
- Eustachys paspaloides* (Vahl) Lanza & Mattei
P. per. (f) in loose colonies in fire-induced woodland grassland on hillsides VF6959.
- Hemarthria natans* Stapf
W. per. (r) casual in river bed G11250.
- Heteropogon contortus* (L.) Roem. & Schult.
E. per. (a) seral fire-degraded grassland stony ground G11017.
- Hyparrhenia cymbaria* (L.) Stapf
E. per. (o) rocky sites deforested slopes G11856.
- H. filipendula* (Hochst.) Stapf var. *filipendula*.
E. & P. per. (va) dominant fire subclimax grassland VFG6088.
- H. filipendula* (Hochst.) Stapf var. *pilosa* (Hack.) Stapf
E. per. (va) fire subclimax grassland rift wall VFG6089.
- H. papillipes* (A. Rich.) Stapf (Syn. *H. lintomi* Stapf)
E. per. (f) in colonies rocky slopes G11853'
- H. rufa* (Nees) Stapf
per. (f) badly drained clay, wet places in ecotones G11345.
- Hypethelia dissoluta* (Steud.) W. D. Clayton (Syn. *Hyparrhenia dissoluta* (Steud.) Hutch.)
E. per. locally (a) fire-degraded vegetation on slopes G11849.
- Leersia hexandra* Sw.
S. per. locally (a) aquatic grass G11106.
- Leptocarydium vulpiastrum* (De Not.) Stapf
E. & W. ann. (a) ruderal G11247.
- Leptochloa chinensis* Nees
S. per. (o) water-holes G11815.
- L. obtusiflora* Hochst.
W. per. (f) secondary sites G11280.

- Odyssea jaegeri* (Pilg.) Robyns & Tournay
A. per. (va) beach of lake where periodically flooded G10288.
- Oplismenus hirtellus* (L.) Beauv.
F. & W. per. (a) in shade G11339.
- Panicum deustum* Thunb..
F. & E. per. (a) forest edges and clearings in partial shade G11224.
- P. infestum* Anderss.
P. per. (o) in loose colonies fire subclimax wooded grassland and stream sides VFG4708; 6887.
- P. maximum* Jacq.
W.E. & P. per. (a) throughout in deforested sites and on alluvium G11882.
- P. meyerianum* Nees
S. & W. per. locally (a) in pools G11015.
- P. repens* L.
S. per (va) in zone edges of wet places G11343.
- P. trichocladum* K. Schum.
F. per. scandent (o) forest edges G12089.
- Paspalidium geminatum* (Forsk.) Stapf
S. & A. per. (a) riverine and delta sites G10977.
- Pennisetum mezianum* Leeke
W. & E. per. (f) badly drained soils G11773.
- P. purpureum* Schumach.
Riverine per. (reed-like) (r) G11909.
- Perotis patens* Gand.
W. ann. ruderal waste land, ecotones G11240.
- Rhynchelytrum repens* (Willd.) C.E. Hubb.
E. & P. per. (f) ruderal disturbed ground G11016.
- R. villosum* (Parl.) Chiov.
ann. (o) casual secondary sites and river bed G11387.
- Schmidtia pappophoroides* J. A. Schmidt (Syn. *S. bulbosa* Stapf).
E. per. (f) secondary sites on ledges G12050.
- Sehima nervosum* (Rottb.) Stapf
E. per. (f), casual in river bed silt G11384.
- Setaria homonyma* (Steud.) Chiov.
F. per. (a) in shade G11361.
- S. pallidifusca* (Schumach.) Stapf & C.E. Hubb.
W. ann. (o) ruderal in ecotones G12939.
- S. phleoides* Stapf
E. per. top of rift wall badly drainage sites G11831.
- S. plicatalis* (Hochst.) Engl.
F. per. (a) in shade G11108.
- S. trinervia* Stapf
P. per. tussock grass (f) fire-induced woodland grassland on hillsides VFG957.
- S. verticillata* (L.) Beauv.
W. ann. (a) in shade G11327.
- Sporobolus consimilis* Fresen. (Syn. *S. robustus* auct. non Kunth).
A. per. tussock grass (va) along contact of alkaline flats and woodland G10951.
- S. fimbriatus* Nees
A. per. bunch grass (f) ecotones bordering alkaline flats disturbed ground VFG5123.
- S. helvolus* (Trin.) Dur. & Schinz.
E. per. stoloniferous (o) secondary sites on ledges and stream sides VFG5320.
- S. marginatus* A. Rich.
W. ann./per. (va) redistributed soil and ecotone between woodland and alkaline grasslands G11772; 11811.
- S. pellucidus* Hochst.
E. per. (o) secondary sites G12054.
- S. pyramidalis* Beauv.
W. per. tussock grass (f) ecotones and ruderal at secondary sites G11265. VFG6886.
- S. spicatus* (Vahl) Kunth
A. per. (va) over lake flats G10995.
- Tetrapogon cenchriformis* (A. Rich.) Clayton
E. ann. (o) ruderal disturbed places G11326.
- T. tenellus* (Roxb.) Chiov.
E. ann. (o) ruderal disturbed places G11329.
- Tragus berteronianus* Schult.
W. ann. (f) ruderal and in ecotones G11221.
- Tricholaena eichingeri* (Mez) Stapf & C.E. Hubb.
per. casual river bed G11385.

Urochloa panicoides Beauv.

W. ann. stoloniferous (o) early seral herbage VFG4865.

U. pullulans Stapf

W. per. (f) ruderal and in ecotones G11278.

U. trichopus (Hochst.) Stapf

W.F. & S. per. (va) ruderal and secondary grassland sites G12037.

Filices

Ferns Fern allies.

6 Ophioglossaceae

Ophioglossum sp.

W. seasonal growth, locally (a) redistributed soil G11116.

17 Adiantaceae

Actinopteris radiata (Poir.) Link.

E. growth only during rains rocky crevices G11084

A. semiflabellata Pic.-Ser.

E. ecologically sympatric with above G11152.

Adiantum capillus-veneris L.

F. locally (va) river gorges G11889.

A. incisum Forsk.

E. (o) moist rock crevices G11153.

Doryopteris nickelsii Tard.

E. (r) over-hanging rocks G11039.

Pellaea adiantoides (Willd.) Kaulf.

E. (o) rather dry exposed rock crevices VFG5606.

Pteris vittata L.

F. (f) stream sides G10967.

19 Davalliaceae

Nephrolepis biserrata (Sw.) Schott.

F. locally (a) spring heads 10966.

24 Thelypteridaceae

Cyclosorus dentatus (Forsk.) Cheng.

F. (f) riverine and spring heads G11373.

32 Marsileaceae

Marsilea minuta L.

S. aquatic (a) any muddy verges and pools G11027.

References.

- CLAYTON, W. D. (1969) A revision of the genus *Hyparrhemia*, *Kew Bull. Add. Ser.* 2.
 GREENWAY, P. J. & VESEY-FITZGERALD, D. F. (1969) The Vegetation of Lake Manyara National Park. *J. Ecol.* 57; 127-149.
 HUTCHINSON, J. (1926) The Families of Flowering Plants I Dicotyledons. (1944) II Monocotyledons. Macmillan & Co. London.
 SCHELPE, E. A. C. L. E. (1970) Pteridophyta, Flora Zambesiaca. Crown Agents London.
 VESEY-FITZGERALD, D. F. (1969) Utilization of the habitat by buffalo in the Lake Manyara National Park. *E. Afr. Wildl. J.* 7; 131-145.

INDEX

to families

Note: For easy reference each family is prefixed by the number used in Hutchinson, J. The Families of Flowering Plants I Dicotyledons, and II Monocotyledons. Macmillan, London. The Ferns, Schelpe, E. A. C. L. E., Pteridophyta in Fl. Zamb. Crown Agents, London.

Acanthaceae	259	Gentianaceae	239
Adiantaceae	17	Geraniaceae	67
Aizoaceae	54	Guttiferae	126
Agavaceae	313	Graminae	332
Amaranthaceae	63	Hydnoraceae	26
Amaryllidaceae	306	Icacinaceae	179
Anacardiaceae	205	Labiatae	264
Apocynaceae	230	Lemnaceae	303
Araceae	302	Liliaceae	293
Asclepiadaceae	231	Lobeliaceae	244
Balanitaceae	195A	Loganiaceae	228
Balsaminaceae	71	Loranthaceae	185
Bignoniaceae	257	Lythraceae	72
Bombacaceae	131	Malpighiaceae	133
Boraginaceae	249	Malvaceae	132
Burseraceae	196	Marsileaceae	32
Caesalpiniaceae	146	Meliaceae	197
Canellaceae	95	Menispermaceae	23
Capparaceae	36	Mimosaceae	147
Celastraceae	173	Moraceae	167
Ceratophyllaceae	17	Myrtaceae	118
Chenopodiaceae	61	Nyctaginaceae	83
Combretaceae	121	Nymphaeaceae	18
Compositae	238	Ochnaceae	114
Commelinaceae	280	Olaceae	182
Convolvulaceae	251	Oleaceae	229
Crassulaceae	45	Onagraceae	77
Cruciferae	39	Ophioglossaceae	6
Curcubitaceae	103	Opiliaceae	183
Cyperaceae	331	Orchidaceae	326
Davalliaceae	19	Palmae	314
Ebenaceae	221	Papilionaceae	148
Euphorbiaceae	136	Passifloraceae	101
Flacourtiaceae	93		

Pedaliaceae	258	Simaroubaceae	195
Piperaceae	28	Solanaceae	250
Plumbaginaceae	241	Sterculiaceae	130
Polygalaceae	42		
Polygonaceae	57	Thelypteridaceae	24
Pontederiaceae	296	Tiliaceae	128
Portulacaceae	56	Typhaceae	305
Rhamnaceae	190	Ulmaceae	165
Rubiaceae	232	Umbelliferae	213
Rutaceae	194	Urticaceae	169
Salvadoraceae	180	Verbenaceae	263
Santalaceae	186	Vitaceae	193
Sapindaceae	198		
Sapotaceae	222	Zingiberaceae	290
Scrophulariaceae	252	Zygophyllaceae	66

(Received 14th April, 1971).

P. J Greenway, E. A. Herbarium, P.O. Box 45166, Nairobi
D. F. Vesey-FitzGerald, Arusha National Park, P.O. Box 3134, Arusha