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THE VEGETATION OF MOUNT NYIRU (SAMBURU DISTRICT, KENYA): A CHECKLIST AND SYNTAXONOMICAL SURVEY

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ABSTRACT

The forests of Northern Kenya, and particularly of Mt Nyiru, have not been studied in detail, although they are extensive and play an important role in the life of the pastoralist communities surrounding them. Here, we present a checklist of the plants of Mount Nyiru and a syntaxonomic survey of the forest. Four hundred and thirty three taxa belonging to 284 genera and 102 families of higher plants are recorded. Thirty-nine taxa are new for the floral region K1. A syntaxonomic survey of the area shows that most forests belonged to the *Juniperetea procerae* (Montane Xeromorphic Cedar Forests). The *Juniperion procerae*, with the *Faureo salignae-Ilicetum mitis* on the wet mountain tops, and the *Myrsino africanae-Juniperetum procerae* in drier areas, were most commonly encountered. Interestingly, the top of Mt. Nyiru was covered with rather large stands of the *Hagenietea abyssinicae* (Subalpine Elfin Forests) but lacking *Hagenia abyssinica* itself, and extensive *Sinarundinarietea alpinae* (Bamboo Forests).

INTRODUCTION

The Northern Region of Kenya occupies nearly 50% of the land surface area of the country, yet it has only received marginal biological attention. For a long time, it was basically only visited by adventurers and big game hunters. The colonial name “Northern Frontier District” clearly illustrates this situation.

It is still sparsely populated, and large parts are only accessible with difficulty. The few scientific studies that have been carried out in the North, mainly focused on its geological features (Shackleton, 1946; Dixey, 1948; Dodson, 1963; Randel, 1967). The first, more comprehensive scientific research project, was the Unesco-IPAL study of the 1970's.

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Geology

The Northern Region consists of vast alluvial inland plains, inclining from altitudes of about 1200 m to the North of Mt. Kenya to barely 400 m around Lake Turkana. On the Southwest, a chain of mountains consisting of old cristallinic Precambrian basement rocks, mainly extremely durable gneisses and granites, borders the plains. For this reason, the steep Ndoto and Nyiru Ranges, reaching up to 2752 m, were left standing during the different erosion cycles influencing the region (Shackleton, 1946). Next to these, a series of Quarternary volcanic peaks, like Mt. Kulal (2285 m), Mt. Marsabit (1707 m) and the Huri Hills (1479 m), tower over the inland plains. In contrast to the soils of the plains, which consist mainly of Vertisols, Regosols, Lithosols and Cambisols, the mountain slopes are mainly covered with humic Acrisols over the basement formations, and deep, humic Andosols in volcanic areas (Mäkel, 1986; Mäkel & Schultka, 1983; Mäkel & Walter, 1983).

Climate

According to the climatological classification of Jätzold (1977, 1981), the northern plains are part of the hot, arid tropical climate, with two short sub-humid seasons. Mean monthly temperatures range from 20–26°C in the plains, to 17–19°C in the mountains (Gatab, 1657 m). The average annual rainfall can be as low as 100–150 mm in the Hedad plain and Chalbi desert, rising to 500 mm in the valleys of the Nyiru and Ndoto mountains. In the mountain forest zone, a rainfall of about 1200 mm can be reached (Edwards *et al.*, 1979). The main rainfall is concentrated in two wet seasons, from March to May and from October to December. However, extreme rainfall occurs, e.g. 175 mm in 6 hours in Gatab on Mt. Kulal (Mäkel & Walter, 1983).

Vegetation

Most mountain areas in Northern Kenya, located between 36°40'–38°00'E and 01°40'–03°40'N, are covered with evergreen montane forest. They owe their existence to the humidity received from mist condensation and frequent cloud formation in the peak areas. Neumann (1898) after visiting the southern Turkana Region wrote: "The western face of Nyiru is.... topped with dark forests...., and here and there hang waterfalls...., filled with the outpourings of the heavy clouds which often cap the summit." Due to their enormous importance for water catchment (Synott, 1979), most mountain areas are gazetted as forest reserves. The extent of these reserves, however, does not really reflect the amount of land actually covered with forest. The Mt. Nyiru forest reserve measures a total of 45,496 ha of which barely 7,890 ha are covered with true forest (Beentje, 1990).

The main reasons for forest destruction in the area are fires caused by honey-hunters and pastoralists, who burn the old grass at the start of the wet season. Others are overgrazing in the forest, and serving the firewood needs of a fast-growing population.

Despite their importance, few studies have been conducted on the montane forests of Northern Kenya. Herlocker (1979) gives some general remarks on the vegetation of the area and Synnot (1979) reports briefly on their status, importance and protection. Only Mount Kulal has received marginally more attention (Hepper, 1983), and a plant checklist for this area was produced (Hepper *et al.*, 1981). Based on 20 relevés on this mountain, Schultka & Hilger (1983) distinguish mainly *Olea hochstetteri*-*Cassipourea malosana* and *Olea africana*-*Juniperus procera* forest.

Synnot (1979) reports that much less is known on the Nyiru and Ndoto forests than on the Kulal and Marsabit forests. He provides a checklist for the trees and shrubs of Mount Nyiru, containing 35 species. White (1983) includes a short comment on the Marsabit

region of Kenya and its afromontane forests, however mainly based on Synnott's observations from Mt. Kulal and Mt. Marsabit, without specific regard to Mt. Nyiru. Beentje (1990) mentions that the vegetation of Mount Nyiru is "mostly unknown".

Although several collectors have visited the area, like J. Adamson (1947 and 1955), O. Kerfoot (1960), P.G. Archer (1971), J.B.C. Cameron (1972), G. Bono (1977), M. Ichikawa (1977) and M.G. Gilbert, F.N. Gachati and G.W. Gatheri (1978), no concerted effort has been made to compile the existing information.

In the work presented here, the forests of Mt. Nyiru were studied in greater detail. A checklist is produced compiling our own with previous collections, and a detailed description of the vegetation texture of the forests, resulting in their syntaxonomic description according to Barkman *et al.* (1986), is given.

MATERIALS AND METHODS

Plant Collections

The majority of plants were collected between 29 March 1995 and 2 April 1995 in the Collector Series Bytebier B., Mwangangi O.M., Kirika P., Waiganjo T., Newton M. & Bussmann R.W., abbreviated to Bytebier *et al.* in the checklist. All specimens were deposited at the East African Herbarium in Nairobi (EA), with duplicates at the Royal Botanic Gardens, Kew (K) and the National Botanic Garden of Belgium, Meise (BR). Bussmann returned several times at a later date and his specimens (Collector Series Bussmann R.W.) are deposited at the Bayreuth University Herbarium. Based on identification lists from the EA archives, we retrieved herbarium specimens previously collected. All specimens were entered in the Brahms (Botanical Research And Herbarium Management System) database.

Nomenclature

The nomenclature of plant families follows Bamps (1976), and in particular the available parts of the Flora of Tropical East Africa (FTEA, Turril *et al.*, 1952-1998). The nomenclature of genera and species of Pteridophytes, Monocotyledones and Dicotyledones follows the new edition of "Upland Kenya Wild Flowers" (Agnew & Agnew 1994). The genus *Sinarundinaria* was treated according to Chao & Renvoize (1989). Cyperaceae and Juncaceae are named according to Haines & Lye (1983), Gramineae according to Phillips (1995). The nomenclature of trees and shrubs is according to "Kenya Trees, Shrubs and Lianas" (Beentje, 1995).

Relevés

During 1995–1996, 48 relevés were established and analyzed according to the methods of Braun-Blanquet (1964) and Mueller-Dombois & Ellenberg (1974), as slightly modified by Hammen *et al.* (1989). For a comprehensive description of the sampling methodology see Bussmann (1994), Bussmann & Beck (1995a) and Hammen *et al.* (1989).

RESULTS AND DISCUSSION

Higher plants checklist

The checklist presented in Appendix 1 is based on the following collections and a few scattered collections leading to a total of 679 specimens, plus a few sight records by Bussmann RW.

Adamson J	28 specimens	1947 & 1955/56
Archer PG	20 specimens	1971
Bono G	39 specimens	1977
Bussmann RW	45 specimens	1995/96
Bytebier <i>et al.</i>	325 specimens	1995
Cameron JBC	37 specimens	1972
Gilbert MG, Gachati FN and Gatheri GW	18 specimens	1978
Ichikawa M	5 specimens	1977
Kerfoot O	156 specimens	1960

A total of 433 taxa belonging to 284 genera and 102 families are now on record. Amongst the 433 taxa there are 40 pteridophytes, 2 gymnosperms, 335 dicots and 56 monocots. Thirty-nine taxa from our own collections were previously not recorded from the floral region K1. They are indicated in the checklist as First Record for K1. The families best represented were Compositae (37 species), Leguminosae (34 species), Gramineae (20 species), Labiatae (18 species), Rubiaceae (16 species), Adiantaceae (12 species), Acanthaceae (12 species), Malvaceae (12 species) and Aspleniaceae (11 species).

Forest types on Mt. Nyiru

A detailed phytosociological description of the forests of Mt. Nyiru, as well as other Northern Kenyan forest areas is included in Bussmann (in press), thus we present here an abbreviated floristical description of the forest types encountered.

Montane Xeromorphic Cedar Forests (Juniperetea -etalia BUSSMANN 1994)

In the dry regions of Northern Kenya, closed forests are always restricted to mountain areas and hilltops, where mist condensation leads to more humid conditions.

All forests encountered clearly belong to the Montane Xeromorphic Cedar Forests. Species such as *Geranium arabicum* and *Achyranthes aspera* were commonly growing in the ground layer, together with the grass *Brachypodium flexum*. Of the differential species of the Cedar-forests, *Juniperus procera* itself was common on Nyiru. In the herbal vegetation the tall grass *Stipa dregeana*, as well as *Sanicula elata*, were encountered regularly.

Many forests of the dry Kenyan North belong to the pure Cedar forests (Juniperion procerae BUSSMANN 1994). The *Myrsine-Juniperus* forest (Myrsino africanae-Juniperetum procerae BUSSMANN 1994), with its pronounced fire-cycle, as the most typical association of the alliance, occurred less often; and the *Faurea-Ilex* forest (Faureo salignae-Ilicetum mitis BUSSMANN 1994) was the association found most commonly. Of the characteristic Cedar forest species, the East African Olive, *Olea europaea* ssp. *africana* was found only in few areas, particularly on southern Mt. Nyiru, forming sometimes almost exclusively the about 10 m high canopy. Other differential species were rarely found, and only in some places *Rapanea melanophloeos*, with its dark-green, shiny

leaves appeared in the forest. The grass *Ehrharta erecta*, differential species for the *Ehrharto erectae-Juniperetum procerae* BUSSMANN 1994, occurred in many places, forming partly dense tufts on the forest floor on Mt. Nyiru. The floristic composition of the forests, however, indicated without doubt that most stands belonged to the pure *Faureo salignae-Ilicetum mitis* BUSSMANN 1994.

This association, first described from the northeastern slopes of Mt. Kenya (Bussmann & Beck, 1995a), clearly dominated most of the mountain areas studied. In the type locality, forests of this type were encountered only as remnants on very steep slopes with relatively shallow soils, whereas in the North in a very striking contrast, the *Faureo-Ilicetum* was encountered under almost all slope conditions. Only the Proteacean *Faurea saligna*, with its leathery leaves shining red in the green canopy, grew with high abundance, often dominating the canopy, while *Ilex mitis* was completely absent. In contrast to the lack of differential species, the accompanying flora encountered was very characteristic, with e.g. *Piper capense*, the leathery fern *Arachnoides foliosa* or the stinging nettle *Laportea alatipes*, among many other species, the typical companions of the association were found abundantly. Nevertheless, in comparison to the stands on Mt. Kenya, the floristic composition of the *Faureo-Ilicetum* showed many differences, especially with regard to the shrub stratum, and therefore the northern stands have to be regarded as a distinct subassociation of their own, differentiated by the very abundant occurrence of *Xymalos monospora*, often forming a dense shrub layer, a fact which was never observed in the typical *Faureo-Ilicetum*. In addition, *Xymalos*, normally found only as a small shrub, reaches up into the lower canopy in many places forming a second, lower tree stratum of its own. In the shrub layer *Brucea antidysenterica* and the climbing *Clerodendrum johnstonii*, as well as *Clausena anisata*, were also encountered as differential species. The ferns *Pteris quadriaurita* and *Doryopteris kirkii*, together with the otherwise rare liana *Clematis brachiata*, and especially the Acanthacean *Dicliptera colorata*, in places covering large areas of the forest floor, are also differential, and so are the epiphytic orchids *Polystachya piersii* and *Aerangis thomsonii*, the latter often dangling in carpets from its sustaining branches. The most striking feature of these forests however, is the abundance of very old, and therefore extremely tall and thick specimens, of *Faurea saligna*, some of which reached a girth of more than 2 m at breast height indicating, that these forests have never been disturbed by logging.

Differences in humidity lead to two variants of these *Xymalos*-dominated forests. The most commonly encountered wet variety, growing mainly on higher altitudes, clearly receives more moisture, which was shown by the many fern species in the undergrowth. Of them, *Amauropeltis bergiana* and *Stenogramma pozoi* were regarded as differential species. Further differential taxa, all requiring high humidity were the creeping *Droguetia iners* and *Crassula alsinoides*, *Drymaria cordata*, *Dicrocephala integrifolia*, together with the Urticacean *Pilea johnstonii*, and *Aneilema pedunculatum*. In the higher strata *Solanum schumannianum* and the tree *Schefflera volkensii* appeared. Of the companions, the rare *Tarenna graveolens*, *Chionanthes battiscombei* and *Turraea holstii*, appearing mainly in the shrub stratum, as well as *Pavetta gardeniifolia* deserve special note.

At the lower limit of the *Faurea-Ilex* forests, in transition to the *Myrsine-Juniperus-Cadia* forest (*Myrsino-Juniperetum cadietosum purpureae*, Bussmann, in press), almost all of the less drought resistant species, especially Pteridophytes, disappeared due to the much drier conditions. Whereas in the previous variant the forest floor was always covered with living herbs and also with an often dense grass layer even at the peak of the dry season, in the lower forests the ground was often found bare, as all vegetation had disappeared due to

the drought. Differential species encountered were the tall *Plectranthus barbatus*, *Stellaria sennii* and the Cyperacean *Schoenoxiphium lehmannii*. Because livestock often grazes these areas at the beginning of the dry season, weed-like species like *Solanum incanum*, *Pupalia lappacea* and *Pteridium aquilinum* (the latter being an indicator of fire), also occurred as differential species. Important companions were *Crassocephalum montuosum*, *Desmodium repandum*, *Hypoestes forskahlii*, *Leonotis nepetifolia*, *Microglossa pyridifolia* and *Mikaniopsis bambuseti*.

The drier lower slopes of Mt. Nyiru were covered by a vegetation belonging to the *Myrsino africanae-Juniperetum procerae* BUSSMANN 1994, forming the transition zone to the savanna areas. Fires occur regularly in this area. They are lit by pastoralists to improve the grass growth before the start of the rains or by honey hunters smoking out bees. At long intervals they also occur naturally. Therefore the *Myrsino-Juniperetum* shows the fire cycle of the Cedar-forests best (Bussmann & Beck, 1995b). Consequently *Myrsine africana*, a differential species for these forests, and one particularly indicating the influence of fire, was found with very high cover/abundance in most areas, often forming a second, lower shrub stratum. On Mt. Nyiru, *Juniperus procera* occurred with high cover also. Of the characteristic species, only *Rhamnus prinoides* was found although much less abundant. Interestingly, *Nuxia congesta* appeared often with high cover in the tree stratum, and the Acanthacean *Justicia striata* formed patches on the forest floor. The high abundance of *Teclea nobilis* in the shrub layer and the lower tree stratum is also worth mentioning. The presence of a rather different flora, in comparison to other areas, e.g. Mt. Kenya (Bussmann & Beck, 1995a), description of a new subassociation (Bussmann, in press).

In transition to a dense thorny bushland, formed mainly by species of the genera *Commiphora*, *Grewia* and partly *Acacia*, this vegetation type was encountered on the steep rocky lower slopes of Mt. Nyiru. With an often very dry ground layer, leaving many areas of the rocks exposed, forests of this type showed a very open appearance and due to the frequent fires even the higher shrub stratum had been nearly completely destroyed. Many *Juniperus* trees in these areas were found dead or dying, and due to the frequent fires young specimens were rarely observed. In the open shrub stratum, *Cordia purpurea* and *Vangueria apiculata* occurred as differential species of this subassociation, together with the small tree *Cordia monoica* in the canopy. The set of differential species was completed by a high number of drought resistant ferns, especially of the genus *Cheilanthes*, growing among the rocks. Namely *Pellea alchemilloides*, *Cheilanthes bergiana*, *C. multifida*, *C. tecta* and *C. hirta* were encountered, whereas the very rare *Asplenium trichomanes* occurred on some high, shady cliffs. The companions, the Euphorbiacean *Croton megalocarpus* in the canopy and the Rutacean *Teclea simplicifolia* in the shrub stratum, deserve special note, as they showed clear links to the *Brachylaenion huillensis* BUSSMANN 1994, an alliance mainly found in Central and Southern Kenya. *Scadoxus multiflorus*, with its large bright-red inflorescence was also found as a companion, among many other species.

Subalpine Elfin forests (Hageniotea abyssinicae BUSSMANN 1994.)

Large grassy clearings were only found on top of Mt. Nyiru. Many huts used by Samburu pastoralists during the dry season indicated that these areas are heavily grazed. At the borders of the grasslands, and partly as islands in-between, dense thickets of St. John's Wort (*Hypericum revolutum*) were growing together with young specimens of *Juniperus procera*. The high cover/abundance of *Hypericum* indicated that these forests belong to the *Hagenia-Hypericum* forest (*Hagenia abyssinicae-Hypericetum revoluti* BUSSMANN 1994).

Whether *Hagenia abyssinica* itself has ever grown in these areas remains an enigma as no koso trees were found. The high cover of young *Juniperus* trees, all of the same age, has to be regarded as a sign of a very large fire about 10 years ago (judged by the size of the trees). Only few dead specimens of old Cedars were found. It is assumed that in the successional process the Hagenio-Hypericetum on Nyiru will probably be replaced by the Myrsino-Juniperetum, especially with regard to the more frequent use of the area as dry season pasture, leading to more frequent burning.

At present, despite the growing influence of *Juniperus*, the Thymeleaceae *Gnidia glauca*, with its yellow flowers appearing in dense clusters in the wet season, still dominates the canopy of these forests, forming often closed stands about 8 m tall. Therefore, the topmost forests of Mt. Nyiru clearly belong to the Gnidietum glaucae BUSSMANN 1994.

Montane Bamboo Forests (Sinarundinarietea alpinae BUSSMANN 1994)

The East African Bamboo, *Sinarundinaria alpina*, is known to cover vast areas especially of the wet southern and south-eastern slopes of Mt. Kenya and the Aberdare and Mau Ranges in Central Kenya. In other areas of the country, however, the species occurs only rarely and in Northern Kenya bamboo is nearly absent. In some areas of Nyiru, probably in places with the highest amount of condensing mist, *Sinarundinaria alpina* was encountered forming dense stands up to 6–8 m tall. These bamboo forests were very similar to the ones described from Western Mt. Kenya (Bussmann & Beck, 1995a), with *Podocarpus latifolius* frequently protruding from the closed bamboo stands. All stands studied were very dense, with only a small amount of light reaching the ground, which was therefore often bare of vegetation. Trails of large game, e.g. elephants and buffaloes, very frequent in other areas where bamboo grows, were not found on Nyiru. This made the bamboo forests nearly impenetrable. The presence of *Sinarundinaria* on Mt. Nyiru has to be regarded as of special importance with respect to the biogeography of the species. The Nyiru population can be interpreted as a link between the main growing area of the species and the stands on the southern slopes of the Bale mountains in Southern Ethiopia, about 500 km further North (Bussmann, 1997).

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APPENDIX 1: Checklist of the plants of Mount Nyiru**PTERIDOPHYTA**

1600–2450 m

ACTINIOPTERIDACEAE

Actiniopteris semiflabellata Pic.Serm.
Bytebier B *et al.* 344; Bussmann R 9743
1600–2450 m

ADIANTACEAE

Adiantum capillus-veneris L.
Bytebier B *et al.* 314; Cameron JBC 151;
Gilbert MG, Gachathi FN & Gatheri GW
5209; Archer PG 689; Bussmann R 9734
1219–2450m
Adiantum poiretii Wikstr.
Bytebier B *et al.* 76
2400–2400m
Cheilanthes bergiana Kunze
Bussmann R 9811
2350–2550 m
First record for K1
Cheilanthes farinosa (Forssk.) Kaulf.
Bytebier B *et al.* 252; Bussmann R 9809
2200–2450 m
Cheilanthes hirta Sw.
Bussmann R 9812
2350–2550 m
Cheilanthes marantae (L.) Domin
Cameron JBC 148
1676–1676 m
Cheilanthes multifida (Sw.) Sw.
Bytebier B *et al.* 253, 329, 336; Gilbert
MG, Gachathi FN & Gatheri GW 5196;
Bussmann R 9818
1600–2450 m
Cheilanthes tecta F.M.Jarret ined.
Bussmann R., Sight record
2350–2550 m
Doriopteris kirkii (Hook.) Alston
Bussmann R 9752
2350–2550 m
Pellaea adiantoides (Willd.) J.Sm.
Bussmann R 9797
2350–2550 m
Pellaea calomelanos (Sw.) Link
Bytebier B *et al.* 339
1600–1600 m
Pellaea longipilosa Bonap.
Bytebier B *et al.* 327; Bussmann R 9822

ASPLENIACEAE

Asplenium abyssinicum Fée
Cameron JBC 149
2439–2439 m
Asplenium adiantum-nigrum L.
Cameron JBC 133
2515–2515 m
Asplenium aethiopicum (Burm.f.) Bech.
Bytebier B *et al.* 72; Gilbert MG, Gachathi
FN & Gatheri GW 5193; Cameron JBC
146; Bussmann R 9698
1600–2450 m
Asplenium elliottii C.H.Wright
Bytebier B *et al.* 17A; Bussmann R 9701
2400–2450 m
Asplenium erectum Willd. var.
usambarense (Hieron.) Schelpe
Bytebier B *et al.* 38, 251; Bussmann R
9708
2200–2450 m
Asplenium friesiorum C.Chr.
Bytebier B *et al.* 6, 17B; Cameron JBC
144; Bussmann R 9715
2286–2450 m
Asplenium loxoscaphoides Baker
Bussmann R 9740
2350–2550 m
Asplenium monanthes L.
Bytebier B *et al.* 73, Cameron JBC 137;
Bussmann R 9704
2134–2450 m
Asplenium strangeanum Pic.Serm.
Bytebier B *et al.* 250; Cameron JBC 136
2200–2286 m
Asplenium theciferum (Kunth) Mett.
Bytebier B *et al.* 74; Cameron JBC 134;
Bussmann R 9706
2134–2450 m
Asplenium trichomanes L.
Cameron JBC 135; Gilbert MG, Gachathi
FN & Gatheri GW 5195; Bussmann R
9710
1600–2450 m

DENNSTAEDTIACEAE*Hypolepis goetzei* Reimers

Cameron JBC 139

2134–2134 m

Pteridium aquilinum (L.) KuhnBytebier B *et al.* 194

2500–2500 m

DRYOPTERIDACEAE*Arachniodes foliosa* (C.Chr.) Schelpe

Cameron JBC 130

2439–2439 m

Polystichum fuscopaleaceum AlstonBytebier B *et al.* 50; Cameron JBC 147;

Bono G 23; Bussmann R 9803, 9796

2400–2450 m

POLYPODIACEAE*Loxogramme abyssinica* (Baker)

M.G.Price

Bytebier B *et al.* 46

2400–2400 m

Pleopeltis macrocarpa (Bory ex Willd.)

Kaulf.

Cameron JBC 131, 145

2439–2439 m

PTERIDACEAE*Pteris catoptera* KunzeBytebier B *et al.* 69

2400–2400 m

Pteris dentata Forssk.

Bono G 24, 38, 211; Cameron JBC 143,

152

1219–2439 m

Pteris quadriaurita Retz.

Bussmann R 9814

2350–2550 m

SCHIZAEACEAE*Mohria vestita* BakerBytebier B *et al.* 254

2200–2200 m

First record for K1

SELAGINELLACEAE*Selaginella dregei* (C.Presl) Hieron.

Alexander EAH 11859

THELYPTERIDACEAE*Amauropelta bergiana* (Schltdl.) Holttum

Bussmann R 9799

2350–2550 m

Amauropelta oppositifomis (C.Chr.)

Holttum

Bytebier B *et al.* 222

2500–2500 m

First record for K1

Stegnogramma pozoi (Lag.) K.Iwats.Bytebier B *et al.* 48; Bussmann R 9791,

9792

2400–2450 m

WOODSIACEAE*Cystopteris diaphanum* (Bory) BlasdelBytebier B *et al.* 25; Cameron JBC 150

2400–2439 m

Cystopteris fragilis (L.) Bernh.

Bussmann R 9795

2350–2550 m

GYMNOSPERMAE**CUPRESSACEAE***Juniperus procera* Endl.

Adamson J 393, Adamson J B 6162;

Bytebier B *et al.* 188

2439–2500 m

PODOCARPACEAE*Podocarpus latifolius* (Thunb.) Mirb.Bytebier B *et al.* 96; Cameron JBC 128;

Adamson J 392

2439–2500 m

ANGIOSPERMAE**DICOTYLEDONAE****ACANTHACEAE***Acanthopale pubescens* C.B.Clarke

Kerfoot O 2067

2439–2439 m

Crossandra massaica Mildbr.Bytebier B *et al.* 323

1600–1600 m

Dicliptera colorata C.B.Clarke

Bussmann R 9786

2350–2550 m

Dicliptera laxata C.B. Clarke

Kerfoot O 2068

2743–2743 m

Dyschoriste radicans Nees

Bytebier B *et al.* 189

2500–2500m

Hypoestes forskahlii (Vahl) R.Br.

Bytebier B *et al.* 269

Kerfoot O 2001

2350–2439m

Hypoestes triflora (Forssk.) Roem. & Schult.

Bytebier B *et al.* 210

Kerfoot O 2076

2439–2500m

Isoglossa gregorii (S.Moore) Lindau

Bytebier B *et al.* 58

Kerfoot O 2069

2400–2743m

Justicia glabra Koen. ex Roxb.

Bytebier B *et al.* 312

1600–1600m

Justicia lorata Ensermu

Bytebier B *et al.* 341, 350

1600–1600m

First record for K1

Justicia striata (K1.) Bullock

Bussmann R, Sight record

2350–2550m

Thunbergia alata Bojer ex Sims

Bytebier B *et al.* 258; Kerfoot O 2090

2350–2591m

AMARANTHACEAE

Achyranthes aspera L.

Bytebier B *et al.* 44

2400–2400m

Celosia anthelminthica Asch.

Kerfoot O 2024

2439–2439m

Celosia schweinfurthiana Schinz

Bytebier B *et al.* 309

1600–1600m

Cyathula polycephala Baker

Bytebier B *et al.* 66

2400–2400m

First record for K1

Pupalia lappacea (L.) A.Juss.

Bytebier B *et al.* 248

2200–2200m

Sericocomopsis hildebrandtii Schinz

Kerfoot O 2080

2713–2713 m

ANACARDIACEAE

Rhus natalensis Krauss

Bytebier B *et al.* 278; Kerfoot O 1948, 1949, 1950

2134–2350 m

Rhus ruspolii Engl.

Bytebier B *et al.* 276; Kerfoot O 1945

2134–2350 m

APOCYNACEAE

Carissa edulis (Forssk.) Vahl

Kerfoot O 2023

2134–2134 m

ARALIACEAE

Cussonia holstii Engl. var. *holstii*

Bytebier B *et al.* 262; Kerfoot O 1942;

Bono G 323

2134–2350 m

Schefflera volkensii (Engl.) Harms

Bussmann R, Sight record

2350–2550 m

ASCLEPIADACEAE

Ceropegia

Bytebier B *et al.* 201

2500–2500 m

Ceropegia ballyana Bullock

Bytebier B *et al.* 249

2200–2200 m

First record for K1

Cynanchum altiscandens K.Schum.

Bytebier B *et al.* 263

2350–2350 m

First record for K1

Gomphocarpus fruticosus (L.) W.T.Aiton

Bytebier B *et al.* 240; Kerfoot O 1979

2200–2591 m

Pergularia daemia (Forssk.) Blatt. & MacOwan

Kerfoot O 2021; Bono G 33

1800–1829 m

Periploca linearifolia Quart.-Dill. & A.Rich.

Kerfoot O 1998

2439–2439 m

Secamone punctulata Decne.

Bytebier B *et al.* 294, 363

1600–1600 m

BALSAMINACEAE

Impatiens hochstetteri Warb.

Bussmann R 9785

2350–2550 m

Impatiens meruensis Gilg

Cameron JBC 138

2286–2286 m

Impatiens meruensis Gilg ssp.

septentrionalis Grey-Wilson

Bytebier B *et al.* 51; Kerfoot O 2082

2400–2743 m

Impatiens sodenii Engl.

Bytebier B *et al.* 325; Kerfoot O 2083;

Bono G 202; Adamson TG 18; Bussmann R 9783

1600–2743 m

BEGONIACEAE

Begonia

Bytebier B *et al.* 324

1600–1600 m

BERBERIDACEAE

Berberis holstii Engl.

Kerfoot O 1939

2591–2591 m

BORAGINACEAE

Cordia monoica Roxb.

Kerfoot O 1938; Bono G 26

2134–2300 m

Cynoglossum coeruleum A.DC.

Bytebier B *et al.* 41, 176

2400–2500 m

Cynoglossum coeruleum A.DC. ssp.

johnstonii (Baker) Verdc.

Kerfoot O 2095

2743–2743 m

Lithospermum afroontanum Weim.

Kerfoot O 2006

2286–2286 m

CALLITRICHACEAE

Callitriche stagnalis Scop.

Bytebier B *et al.* 231; Bono G 208

2450–2500 m

CAMPANULACEAE

Campanula edulis Forssk.

Archer PG 695; Kerfoot O 2097

2286–2743 m

Wahlenbergia abyssinica (A.Rich.) Thulin ssp. *abyssinica*

Bytebier B *et al.* 92; Cameron JBC 108;

Kerfoot O 2063; Adamson J 541;

Bussmann R 9778

2134–2743 m

Wahlenbergia capillacea (L.f.) A.DC. ssp. *tenuior* (Engl.) Thulin

Bytebier B *et al.* 93

2500–2500 m

Wahlenbergia lobelioides (L.f.) A.DC. ssp. *nutabunda* (Guss.) Murb.

Archer PG 697

2286–2286 m

Wahlenbergia virgata Engl.

Bytebier B *et al.* 77; Adamson J 540;

Archer PG 694

2400–2439 m

CAPPARACEAE

Capparis tomentosa Lam.

Bytebier B *et al.* 334; Kerfoot O 1985

1600–2591 m

Cleome

Kerfoot O 2062

2134–2134 m

Cleome usambarica Pax

Bytebier B *et al.* 318

1600–1600 m

Crateva adansonii DC.

Kerfoot O 1990

1524–1524 m

Gynandropsis gynandra (L.) Briq.

Bytebier B *et al.* 288

2350–2350 m

Maerua angolensis DC.

Kerfoot O 1931

1981–1981 m

Maerua triphylla A.Rich.

Bytebier B *et al.* 345

1600–1600 m

Thylachium africanum Lour.

Kerfoot O 1958

2439–2439 m

CARYOPHYLLACEAE*Cerastium indicum* Wight & Arn.Bytebier B *et al.* 164; Kerfoot O 2073

2500–2743 m

Drymaria cordata (L.) Willd. ex Roem. & Schult.Bytebier B *et al.* 1; Kerfoot O 2096

2400–2743 m

Pollichia campestris AitonBytebier B *et al.* 238

Kerfoot O 2099

2200–2743 m

Silene burchellii Othl ex DC.

Adamson J 552

2743–2743 m

Silene macrosolen Steud. ex A.Rich.

Kerfoot O 2074

2743–2743 m

Stellaria sennii Chiov.Bytebier B *et al.* 215

2500–2500 m

CELASTRACEAE*Maytenus heterophylla* (Eckl. & Zeyh.)

N.Robson

Bytebier B *et al.* 279

2350–2350 m

Mystroxydon aethiopicum (Thunb.) Loes.Bytebier B *et al.* 319

1600–1600 m

CHENOPODIACEAE*Chenopodium schraderianum* Schult.Bytebier B *et al.* 289

2350–2350 m

COMPOSITAE*Adenostemma perrottetii* DC.

Gilbert MG, Gachathi FN & Gatheri GW

5210; Kerfoot O 2056

1350–2743 m

Berkheya spekeana Oliv.

Archer PG 705

2560–2560 m

Bidens flagellata (Sherff) MesfinBytebier B *et al.* 213

2500–2500 m

Bidens hildebrandtii O.Hoffm.Bytebier B *et al.* 317

1600–1600 m

Bidens kilimandscharica (O.Hoffm.)

Sherff

Kerfoot O 2057

2439–2439 m

Bothriocline longipes (Oliv. & Hiern)

N.E.Br.

Bytebier B *et al.* 20; Kerfoot O 2049

2134–2400 m

Carduus nyassanus (S.Moore) R.E.Fr.Bytebier B *et al.* 232

2500–2500 m

First record for K1

Cineraria deltoidea Sond.

Kerfoot O 2046

2134–2134 m

Conyza newii Oliv. & HiernBytebier B *et al.* 19; Kerfoot O 2043

2400–2439 m

Conyza steudelii Sch.Bip. ex A.Rich.Bytebier B *et al.* 224

2500–2500 m

Conyza stricta Willd.Bytebier B *et al.* 22, 83, 197; Kerfoot O 2045

2134–2500 m

Conyza sumatrensis (Retz.) E.WalkerBytebier B *et al.* 225

2500–2500 m

Crassocephalum montuosum (S.Moore)

Milne-Redh.

Bussmann R, Sight record

2350–2550 m

Dichrocephala chrysanthemifolia (Blume)

DC.

Kerfoot O 2052

2591–2591 m

Dichrocephala integrifolia (L.f.) KuntzeBytebier B *et al.* 35

2400–2400 m

Emilia discifolia (Oliv.) C.JeffreyBytebier B *et al.* 245; Kerfoot O 2055;

Gilbert MG, Gachathi FN & Gatheri GW

5198

1600–2439 m

Emilia somalensis (S.Moore) C.JeffreyBytebier B *et al.* 80

2500–2500 m

Gerbera viridifolia (DC.) Sch.Bip.Bytebier B *et al.* 178

2500–2500 m

Gnaphalium rubriflorum Hilliard
 Bytebier B *et al.* 179, 226
 2500–2500 m
Gutenbergia cordifolia Benth. ex Oliv.
 Bytebier B *et al.* 287
 2350–2350 m
Helichrysum argyranthum O.Hoffm.
 Adamson J 564
 2743–2743 m
Helichrysum forskahlii (J.F.Gmel.)
 Hilliard & B.L.Burt var. *forskahlii*
 Bytebier B *et al.* 62, 87; Adamson J 556
 2400–2500 m
Helichrysum kilimanjari Oliv.
 Bytebier B *et al.* 26
 2400–2400 m
 First record for K1
Helichrysum nudifolium (L.) Less. var.
nudifolium
 Bytebier B *et al.* 204; Archer PG 702;
 Bono G 213
 2286–2500 m
Helichrysum odoratissimum (L.) Less.
 Bussmann R 9759
 2350–2550 m
Hirpicium diffusum (O.Hoffm.) Roessler
 Bytebier B *et al.* 239, 362
 1600–2200 m
Kleinia odora (Forssk.) DC.
 Gilbert MG, Gachathi FN & Gatheri GW
 5187
 1350–1350 m
Laggera elatior R.E.Fr.
 Bytebier B *et al.* 57
 2400–2400 m
 First record for K1
Microglossa pyrifolia (Lam.) Kuntze
 Bytebier B *et al.* 8; Kerfoot O 2047
 2134–2450 m
Mikaniopsis bambuseti (R.E. Fries)
 C.Jeffrey Bussmann R, Sight record
 2350–2550 m
Osteospermum vaillantii (Decne.) Norl.
 Kerfoot O 2054
 2439–2439 m
Senecio hadiensis Forssk.
 Bono G 330
 1700–1700 m
Senecio syringifolius O.Hoffm.
 Bytebier B *et al.* 180

2500–2500 m
Sonchus afromontanus R.E.Fr.
 Bytebier B *et al.* 168, 216
 2500–2500 m
 First record for K1
Vernonia galamensis (Cass.) Less. ssp.
nairobiensis M.G.Gilbert
 Bytebier B *et al.* 196
 2500–2500 m
Vernonia hymenolepis A.Rich.
 Kerfoot O 2041; Bono G 20
 2400–2439 m
Vernonia syringifolia O.Hoffm.
 Bytebier B *et al.* 9, 169
 2400–2500 m
 First record for K1

CONVOLVULACEAE

Ipomoea spathulata Hallier f.
 Bytebier B *et al.* 300
 1600–1600 m
Ipomoea wightii (Wall.) Choisy
 Bytebier B *et al.* 273
 2350–2350 m

CRASSULACEAE

Crassula alba Forssk.
 Bytebier B *et al.* 217; Archer PG 699
 2286–2500 m
Crassula alsinoides (Hook.f.) Engl.
 Kerfoot O 2091
 2743–2743 m
Crassula nodulosa Schönl. var. *nodulosa*
 Archer PG 698; Kerfoot O 2025
 2134–2286 m
Crassula schimperi Fisch. & C.A.Mey.
 ssp. *schimperi*
 Bytebier B *et al.* 85, 243
 2200–2500 m
Kalanchoe citrina Schweinf.
 Bytebier B *et al.* 340, 356; Kerfoot O 2086
 1600–2134 m
Kalanchoe densiflora Rolfe var. *densiflora*
 Bytebier B *et al.* 220; Kerfoot O 2087
 2500–2743 m

CRUCIFERAE

Arabis glabra (L.) Bernh.
 Bytebier B *et al.* 175
 2500–2500 m

First record for K1

Cardamine africana L.

Archer PG 690

2439–2439 m

CUCURBITACEAE

Gerrardanthus lobatus (Cogn.) C.Jeffrey

Bytebier B *et al.* 307

1600–1600 m

Lagenaria

Bytebier B *et al.* 355

1600–1600 m

Lagenaria abyssinica (Hook.f.) C.Jeffrey

Bytebier B *et al.* 52

2400–2400 m

First record for K1

DIPSACACEAE

Dipsacus pinnatifidus A.Rich.

Bytebier B *et al.* 184; Archer PG 704;

Kerfoot O 2003; Bussmann R 9821

2286–2500 m

Scabiosa columbaria L.

Archer PG 696; Cameron JBC 123;

Adamson J 555; Kerfoot O 2075

2286–2743 m

ERICACEAE

Agauria salicifolia (Lam.) Oliv.

Kerfoot O 1970

2743–2743 m

Erica arborea L.

Bytebier B *et al.* 171 ; Kerfoot O 2018;

Bono G 214; Cameron JBC 118

2134–2500 m

Erica mannii (Hook.f.) Beentje ssp.

usambarensis (Alm & T.C.E.Fr.) Beentje

Bytebier B *et al.* 187

2500–2500 m

First record for K1

EUPHORBIACEAE

Acalypha fruticosa Forssk. var.

eglandulosa Radcl.-Sm.

Kerfoot O 1994

2286–2286 m

Acalypha fruticosa Forssk. var. *fruticosa*

Bono G 121

1400–1400 m

Acalypha volkensii Pax

Bytebier B *et al.* 260; Kerfoot O 1995
2134–2350 m

Bridelia micrantha (Hochst.) Baill.

Ichikawa M 906; Kerfoot O 1943

1768–1829 m

Clutia abyssinica Jaub. & Spach var.
abyssinica

Bytebier B *et al.* 193; Bono G 142

1900–2500 m

Croton dichogamus Pax

Bono G 27

1800–1800 m

Croton megalocarpus Hutch.

Kerfoot O 1961

2134–2134 m

Euphorbia

Bytebier B *et al.* 361

1600–1600 m

Euphorbia brevicornu Pax

Bytebier B *et al.* 56

2400–2400 m

First record for K1

Euphorbia depauperata A.Rich. var.
depauperata

Bytebier B *et al.* 170

2500–2500 m

Euphorbia nyikae Pax var. *nyikae*

Bytebier B *et al.* 359

1600–1600 m

First record for K1

Phyllanthus fischeri Pax

Kerfoot O 2017

2134–2134 m

Phyllanthus sepialis Müll.Arg.

Bono G 122

1400–1400 m

FLACOURTIACEAE

Dovyalis abyssinica (A.Rich.) Warb.

Bytebier B *et al.* 158; Kerfoot O 1965

2439–2500 m

Trimeria grandifolia (Burkill) Sleumer
ssp. *tropica*

Bono G 39

2400–2400 m

GERANIACEAE

Geranium aculeolatum Oliv.

Kerfoot O 2038

2439–2439 m

Geranium arabicum Forssk.
 Bytebier B *et al.* 190A; Kerfoot O 2036;
 Bono G 201
 2134–2500 m
Pelargonium alchemilloides (L.) Ait.f. ssp.
multibracteatum (A.Rich.) Kokwaro
 Bytebier B *et al.* 244; Bono G 205;
 Kerfoot O 2039; Bussmann R 9757
 2200–2450 m
Pelargonium whytei Baker
 Kerfoot O 2037
 2439–2439 m

GUTTIFERAE

Garcinia livingstonei T.Anderson
 Bytebier B *et al.* 337
 1600–1600 m
Hypericum kiboense Oliv.
 Adamson J 558
 2743–2743 m
Hypericum revolutum Vahl
 Bytebier B *et al.* 191; Kerfoot O 1932;
 Adamson J 562; Cameron JBC 117
 2500–2743 m
Hypericum roeperanum A.Rich.
 Kerfoot O 1934
 2439–2439 m

HALORAGACEAE

Gunnera perpensa L.
 Bytebier B *et al.* 230; Bussmann R 9788
 2450–2500 m

LABIATAE

Aeollanthus repens Oliv.
 Bytebier B *et al.* 259
 2350–2350 m
 First record for K1
Becium decumbens (Guerke) A.J.Paton
 Bytebier B *et al.* 78
 2500–2500 m
Becium obovatum (E.Mey. ex Benth.)
 N.E.Br. var. *capitatum*
 Archer PG 700; Kerfoot O 2094
 2286–2743 m
Leonotis nepetifolia (L.) R.Br.
 Bytebier B *et al.* 60
 2400–2400 m
Leucas grandis Gürke

Kerfoot O 2089; Gilbert MG, Gachathi FN
 & Gatheri GW 5214
 1350–2743 m
Leucas urticifolia (Vahl) R.Br. var.
annulata Sebalb
 Bytebier B *et al.* 283
 2350–2350 m
Ocimum suave Willd.
 Bytebier B *et al.* 281; Kerfoot O 2002
 2350–2439 m
Plectranthus barbatus Andr.
 Kerfoot O 1992
 2134–2134 m
Plectranthus edulis (Vatke) Agnew
 Bytebier B *et al.* 233
 2500–2500 m
 First record for K1
Plectranthus grandicalyx E.A.Bruce
 Bytebier B *et al.* 84
 2500–2500 m
Plectranthus ignirius (Schweinf.) Agnew
 Gilbert MG, Gachathi FN & Gatheri GW
 5216
 1650–1650 m
Plectranthus sylvestris Gürke
 Bytebier B *et al.* 70
 2400–2400 m
Salvia nilotica (Juss.) Jacq.
 Bytebier B *et al.* 23; Kerfoot O 2066
 2400–2439 m
Satureja
 Bytebier B *et al.* 29, 192
 2400–2500 m
Satureja abyssinica (Benth.) Briq.
 Archer PG 691; Kerfoot O 2060; Cameron
 JBC 112; Bono G 115
 2134–2600 m
Satureja biflora (D.Don) Benth.
 Bytebier B *et al.* 181; Kerfoot O 2029;
 Cameron JBC 109
 2134–2500 m
Satureja pseudosimensis Brenan
 Bytebier B *et al.* 205
 2500–2500 m
 First record for K1
Tinnea aethiopica Kotschy ex Hook.f.
 Bytebier B *et al.* 326
 1600–1600 m

LEGUMINOSAE

- Acacia etbaica* Schweinf.
Bytebier B *et al.* 308
1600–1600 m
Acacia hockii De Wild.
Kerfoot O 1903
2134–2134 m
Acacia senegal (L.) Wild
Bytebier B *et al.* 357
1000–1000 m
Amphicarpa africana (Hook.f.) Harms
Kerfoot O 1915
2652–2652 m
Argyrolobium fischeri Taub.
Archer PG 703; Bono G 30; Cameron JBC 113
2000–2286 m
Cadia purpurea (Picc.) Aiton
Bytebier B *et al.* 333; Ichikawa M 899;
Kerfoot O 1905; Jex-Blake M 11777; Jex-Blake AJ H69/51
1600–2286 m
Chamaecrista usambarensis (Taub.) Standley
Bytebier B *et al.* 199; Adamson J 565
2500–2743 m
Crotalaria
Bytebier B *et al.* 212
2500–2500 m
Crotalaria fascicularis Polhill
Bono G 28
1900–1900 m
Crotalaria incana L. ssp. *purpurascens* (Lam.) Milne-Redh.
Bytebier B *et al.* 152, 265
2350–2500 m
Crotalaria keniensis Baker f.
Kerfoot O 1913
2286–2286 m
Crotalaria lachnocarpoides Engl.
Bytebier B *et al.* 156; Kerfoot O 1906, 1907
2439–2500 m
Crotalaria natalitia Meisn. var. *natalitia*
Bytebier B *et al.* 274; Bono G 132;
Kerfoot O 1914
2134–2500 m
Desmodium repandum (Vahl) DC.
Kerfoot O 1918
2652–2652 m
- Dolichos sericeus* E.Mey. ssp. *sericeus*
Bono G 320
2000–2000 m
Glycine wightii (Wight & Arn.) Verdc. ssp. *petitiana* (A.Rich.) Verdc. var. *mearnsii* (De Wild.) Verdc.
Kerfoot O 1917
1829–1829 m
Glycine wightii (Wight & Arn.) Verdc. ssp. *wightii* var. *longicauda* (Schweinf.) Verdc.
Ichikawa M 905
1676–1676 m
Indigofera atriceps Hook.f. ssp. *atriceps*
Kerfoot O 1909
2134–2134 m
Indigofera lupatana Baker f.
Kerfoot O 1912
2134–2134 m
Indigofera schimperi Jaub. & Spach var. *schimperi*
Gilbert MG, Gachathi FN & Gatheri GW 5192
1350–1350 m
Indigofera swaziensis Bolus var. *swaziensis*
Kerfoot O 1910
2439–2439 m
Indigofera volkensii Taub.
Bytebier B *et al.* 37; Gilbert MG, Gachathi FN & Gatheri GW 5190A
1350–2400 m
Kotschyia recurvifolia (Taub.) F.White ssp. *keniensis* Verdc.
Cameron JBC 119
2439–2439 m
Lablab purpureus (L.) Sweet ssp. *uncinatus* Verdc.
Kerfoot O 1922
2439–2439 m
Lotus goetzei Harms
Kerfoot O 1911
2134–2134 m
Mucuna gigantea (Willd.) DC. ssp. *quadrialata* (Baker) Verdc.
Bytebier B *et al.* 298
1600–1600 m
Ormocarpum trachycarpum (Taub.) Harms
Kerfoot O 1937

2134–2134 m

Psoralea foliosa Oliv.

Adamson J 537

2743–2743 m

Pterolobium stellatum (Forssk.) Brenan

Kerfoot O 1935

1829–1829 m

Tephrosia interrupta Engl. ssp. *interrupta*

Adamson J 559; Kerfoot O 1908; Bono G

133; Gilbert MG, Gachathi FN & Gatheri

GW 5204

1600–2652 m

Teramnus labialis (L.f.) Spreng. ssp.

labialis var. *abyssinicus* (A.Rich.) Verdc.

Kerfoot O 1920

2439–2439 m

Trifolium semipilosum Fresen. var.

semipilosum

Bono G 204

2500–2500 m

Vigna schimperii Baker

Bytebier B *et al.* 34; Kerfoot O 1916

2400–2439 m

Zornia setosa Baker f. ssp. *obovata* (Baker f.) J.Léon. & Milne-Redh.

Bytebier B *et al.* 91

2500–2500 m

LINACEAE

Linum keniense T.C.E.Fr.

Bussmann R 9780

2350–2550 m

Linum volkensii Engl.

Bytebier B *et al.* 95; Adamson J 547

2500–2743 m

LOBELIACEAE

Lobelia giberroa Hemsl.

Bytebier B *et al.* 236

2550–2550 m

Lobelia holstii Engl.

Bytebier B *et al.* 207; Adamson J 566;

Kerfoot O 2085; Cameron JBC 124

2286–2743 m

Monopsis stellarioides (C.Presl) Urb. ssp.

schimperiana (Urb.) Thulin

Bytebier B *et al.* 202

2500–2500 m

First record for K1

LOGANIACEAE

Nuxia congesta Fresen.

Bytebier B *et al.* 182; Bono G 25

2300–2500 m

LORANTHACEAE

Agelanthus elegantulus (Engl.) Polhill & Wiens

Bussmann R 9758

2350–2550 m

First record for K1

Englerina woodfordioides (Schweinf.)

Balle

Bytebier B *et al.* 40, 200

2400–2500 m

MALVACEAE

Abutilon hirtum (Lam.) Sweet

Kerfoot O 2008

2652–2652 m

Abutilon longicuspe A.Rich.

Kerfoot O 1986

2743–2743 m

Abutilon mauritianum (Jacq.) Sweet

Kerfoot O 2010, 2013

2134–2439 m

Hibiscus

Bono G 130

2400–2400 m

Hibiscus fuscus Garcke

Bytebier B *et al.* 286

2350–2350 m

Hibiscus ludwigii Eckl. & Zeyh.

Bono G 29

2100–2100 m

Hibiscus vitifolius L.

Kerfoot O 2009

2743–2743 m

Pavonia kilimandscharica Gürke

Kerfoot O 2011

2743–2743 m

Pavonia patens (Andr.) Chiov.

Bytebier B *et al.* 82

2500–2500 m

Pavonia urens Cav.

Bytebier B *et al.* 97

2500–2500 m

Sida rhombifolia L.

Kerfoot O 2014

2439–2439 m

Sida tenuicarpa Vollesen
Bytebier B *et al.* 167; Bussmann R 9756
2450–2500 m

MELIACEAE

Turraea abyssinica A.Rich.
Bytebier B *et al.* 280
2350–2350 m
First record for K1
Turraea holstii Gürke
Bussmann R, Sight record
2350–2350 m

MENISPERMACEAE

Cocculus pendulus (J.R.Forst. & G.Forst.)
Diels
Bono G 200
2350–2350 m
Stephania abyssinica (Quart.-Dill. &
A.Rich.) Walp.
Kerfoot O 2101
2743–2743 m

MONIMIACEAE

Xymalos monospora (Harv.) Warb.
Bytebier B *et al.* 4; Cameron JBC 129;
Ichikawa M 902
2000–2400 m

MORACEAE

Ficus scassellatii Pamp. ssp. *scassellatii*
Bytebier B *et al.* 338
1600–1600 m
Ficus vallis-choudae Delile
Bytebier B *et al.* 295
1600–1600 m

MYRSINACEAE

Maesa lanceolata Forssk.
Kerfoot O 1952
2743–2743 m
Myrsine africana L.
Bytebier B *et al.* 237; Cameron JBC 120;
Bono G 22
1850–2200 m
Rapanea melanophloeos (L.) Mez
Bytebier B *et al.* 2
2400–2400 m

MYRTACEAE

Syzygium cordatum Hochst.
Kerfoot O 1944
1829–1829 m

NYCTAGINACEAE

Commicarpus helenae (Roem. & Schult.)
Meikle
Bytebier B *et al.* 310
1600–1600 m

OCHNACEAE

Ochna insculpta Sleumer
Bytebier B *et al.* 268
2350–2350 m

OLEACEAE

Chionanthus battiscombei (Hutch.) Stearn
Bussmann R, Sight record
2350–2550 m
Jasminum abyssinicum Hochst. ex DC.
Bytebier B *et al.* 24
2400–2400 m
Jasminum floribundum R.Br. ex Fresen.
Kerfoot O 1978
2743–2743 m
Jasminum fluminense Vell. ssp. *holstii*
(Gilg) Turrill
Kerfoot O 1976; Bono G 129
2300–2743 m
Olea capensis L.
Bytebier B *et al.* 10, 98
2400–2500 m
Olea europaea L. ssp. *africana* (Mill.)
P.Green
Bytebier B *et al.* 88; Kerfoot O 1962,
1964; Adamson J 395; Adamson J B 6164
2378–2500 m
Schrebera alata (Hochst.) Welw.
Bytebier B *et al.* 292
2350–2350 m

ONAGRACEAE

Epilobium hirsutum L.
Bytebier B *et al.* 316
1600–1600 m
First record for K1

OPILIACEAE

Opilia amentacea Roxb.
Bono G 136
2300–2300 m

OROBANCHACEAE

Orobanche minor Sm.
Bytebier B *et al.* 31
2400–2400 m

OXALIDACEAE

Oxalis corniculata L.
Bytebier B *et al.* 163
2500–2500 m
First record for K1

PIPERACEAE

Peperomia abyssinica Miq.
Bytebier B *et al.* 67
2400–2400 m
Piper capense L.
Bytebier B *et al.* 64, 173; Kerfoot O 2022
2400–2743 m

PLUMBAGINACEAE

Plumbago dawei Rolfe
Kerfoot O 2061
2743–2743 m

POLYGALACEAE

Polygala sphenoptera Fresen.
Bytebier B *et al.* 94, 242; Bussmann R
9779
2200–2500 m

POLYGONACEAE

Polygonum amphibium L.
Bussmann R 9787
2350–2550 m
First record for K1
Polygonum setosulum A.Rich.
Bytebier B *et al.* 227; Kerfoot O 2034,
2035
2500–2743 m
Rumex bequaertii De Wild.
Kerfoot O 2030
2134–2134 m
Rumex steudelii A.Rich.
Bytebier B *et al.* 63
2400–2400 m

PRIMULACEAE

Lysimachia volkenstii Engl.
Bytebier B *et al.* 15
2400–2400 m

PROTEACEAE

Faurea saligna Harv.
Bytebier B *et al.* 190B; Kerfoot O 1936
2500–2743 m
Protea caffra Meisn. ssp.
kilimandscharica (Engl.) Chisumpa &
Brummitt
Cameron JBC 127
2134–2134 m

RANUNCULACEAE

Clematis brachiata Thunb.
Bytebier B *et al.* 55
2400–2400 m
Clematis simensis Fresen.
Bytebier B *et al.* 320; Bono G 41; Kerfoot
O 2004
1600–2591 m
Ranunculus multifidus Forssk.
Bytebier B *et al.* 223; Kerfoot O 2032,
2033
1829–2743 m
Thalictrum rhynchocarpum Quart.-Dill. &
A.Rich.
Bytebier B *et al.* 27
2400–2400 m
First record for K1

RHAMNACEAE

Rhamnus prinoides L'Hérit
Bytebier B *et al.* 32; Kerfoot O 1971
2400–2743 m
Rhamnus staddo A.Rich.
Kerfoot O 1946
2134–2134 m
Scutia myrtina (Burm.f.) Kurz
Bytebier B *et al.* 174
2500–2500 m
Ziziphus mucronata Willd. ssp. *mucronata*
Ichikawa M 898; Kerfoot O 1940
1890–1981 m

RHIZOPHORACEAE*Cassipourea malosana* (Baker) AlstonBytebier B *et al.* 11

2400–2400 m

ROSACEAE*Alchemilla cryptantha* A.Rich.Bytebier B *et al.* 33

2400–2400 m

Prunus africana (Hook.f.) KalkmanBytebier B *et al.* 155; Adamson J 390

2439–2500 m

Rubus adolfi-friederici Engl.

Kerfoot O 1983

2743–2743 m

Rubus apetalus Poir.Bytebier B *et al.* 7; Kerfoot O 1984

2400–2743 m

RUBIACEAE*Anthospermum usambarense* K.Schum.

Kerfoot O 1999

2286–2286 m

Galiniera saxifraga (Hochst.) BridsonBytebier B *et al.* 47

2400–2400 m

First record for K1

Galium aparinoides Forssk.Bytebier B *et al.* 39

2400–2400 m

First record for K1

Pavetta abyssinica Fresen. var. *abyssinica*Bytebier B *et al.* 272

2350–2350 m

Pavetta gardeniifolia A.Rich. var.*gardeniifolia*

Cameron JBC 121

2134–2134 m

Pentas lanceolata (Forssk.) DeflersBytebier B *et al.* 271

2350–2350 m

Pentas parvifolia HiernBytebier B *et al.* 304; Kerfoot O 2031;

Gilbert MG, Gachathi FN & Gatheri GW

5213

1350–2439 m

Psychotria kirkii Hiern var. *tarambassica*

(Bremek.) Verdc.

Bytebier B *et al.* 241; Kerfoot O 1966,

1967, 1968; Gilbert MG, Gachathi FN &

Gatheri GW 5197

1600–2591 m

Psychotria orophila PetitBytebier B *et al.* 14; Kerfoot O 1953

2134–2400 m

Psydrax schimperiana (A.Rich.) Bridsonssp. *schimperiana*Bytebier B *et al.* 315

1600–1600 m

Rytigynia uhligii (K.Schum. & K.Krause)

Verdc.

Bytebier B *et al.* 277

2350–2350 m

Tarenna graveolens (S.Moore) Bremek.var. *graveolens*

Kerfoot O 1955

2286–2286 m

Tarenna graveolens (S.Moore) Bremek.var. *impolita* Bridson

Gilbert MG, Gachathi FN & Gatheri GW

5190

1350–1350 m

Vangueria apiculata K.Schum.

Gilbert MG, Gachathi FN & Gatheri GW

5215

1650–1650 m

Vangueria madagascariensis J.F.Gmel.Bytebier B *et al.* 301, 346; Kerfoot O 1954

1600–1829 m

Vangueria volkensii K.Schum. var.*volkensii*Bytebier B *et al.* 275, 328

1600–2350 m

RUTACEAE*Clausena anisata* (Willd.) Benth.Bytebier B *et al.* 5; Kerfoot O 1993;

Adamson J 396

2400–2652 m

Teclea nobilis DelileBytebier B *et al.* 42, 172; Kerfoot O 1957

2400–2500 m

Teclea simplicifolia (Engl.) Verd.

Kerfoot O 1980

2286–2286 m

Vepris samburuensis KokwaroBytebier B *et al.* 313

1600–1600 m

SALVADORACEAE*Salvadora persica* L. var. *persica*

Bono G 212
2000–2000 m

SANTALACEAE

Osyridicarpus schimperianus A.DC.
Bytebier B *et al.* 297, 351
1600–1600 m
Osyris abyssinica (Hochst.) A.Rich.
Kerfoot O 2016
2286–2286 m
Osyris lanceolata Hochst. & Steud.
Bytebier B *et al.* 185
2500–2500 m

SAPINDACEAE

Allophylus abyssinicus (Hochst.) Radlk.
Bytebier B *et al.* 12
2400–2400 m
Allophylus griseo-tomentosus Gilg
Kerfoot O 1951
2134–2134 m
Cardiospermum halicacabum L.
Bytebier B *et al.* 311
1600–1600 m
Dodonaea viscosa (L.) Jacq.
Kerfoot O 1981
2591–2591 m

SAPOTACEAE

Manilkara mocharisia (Baker) Dubard
Adamson TG 17; Kerfoot O 1947
914–2134 m
Mimusops kummel A.DC.
Bytebier B *et al.* 330, 349
1600–1600 m

SCROPHULARIACEAE

Bartsia longiflora Hochst. ex Benth.
Adamson J 546
2743–2743 m
Cynium tenuisectum (Standl.)
O.J.Hansen
Bytebier B *et al.* 208
2500–2500 m
Halleria lucida L.
Bytebier B *et al.* 86; Adamson J 536;
Kerfoot O 1975
2500–2743 m

Hebenstretia angolensis Rolfe
Bytebier B *et al.* 162; Cameron JBC 126;
Kerfoot O 2020
2439–2500 m
Misopates orontium (L.) Raf.
Archer PG 692
2286–2286 m
Selago thomsonii Rolfe
Bytebier B *et al.* 186, 364; Adamson J 553
1600–2743 m
Verbascum brevipedicellatum (Engl.)
Hub.-Mor.
Bytebier B *et al.* 30, 161; Adamson J 560
2400–2743 m
Veronica anagallis-aquatica L.
Bytebier B *et al.* 235
2550–2550 m

SIMAROUBACEAE

Brucea antidysenterica Lam.
Bytebier B *et al.* 16; Bono G 37
2400–2450 m

SOLANACEAE

Solanum aculeatissimum Jacq.
Bytebier B *et al.* 65; Kerfoot O 1987
2400–2743 m
Solanum benderianum Engl.
Kerfoot O 2000
2591–2591 m
Solanum incanum L.
Bussmann R, Sight record
2350–2550 m
Solanum indicum L.
Bytebier B *et al.* 13, 266
2350–2400 m
Solanum indicum L. ssp. *adoense*
(Hochst.) Bitter
Kerfoot O 1988, 1989
2439–2743 m
Solanum indicum L. ssp. *grandifrons*
Bitter
Bytebier B *et al.* 75
2400–2400 m
Solanum nigrum L.
Bytebier B *et al.* 221; Bono G 134
2400–2500 m
Solanum renschii Vatke
Bytebier B *et al.* 305
1600–1600 m

Solanum schumannianum Dammer
Bussmann R, Sight record
2350–2550 m

Solanum terminale Forssk.
Bytebier B *et al.* 28
2400–2400 m

STERCULIACEAE

Dombeya goetzenii K.Schum.
Kerfoot O 1941
2439–2439 m

Dombeya rotundifolia Planch.
Gilbert MG, Gachathi FN & Gatheri GW
5199
1600–1600 m

THYMELAEACEAE

Gnidia glauca (Fresen.) Gil
Bytebier B *et al.* 165; Kerfoot O 2005
Cameron JBC 122
2286–2500 m
Struthiola thomsonii Oliv.
Bytebier B *et al.* 203; Archer PG 706;
Adamson J 545
2500–2743 m

TILIACEAE

Sparrmannia ricinocarpa (Eckl. & Zeyh.)
Kuntze
Kerfoot O 2015
2439–2439 m

UMBELLIFERAE

Alepidea peduncularis A.Rich.
Bytebier B *et al.* 206; Kerfoot O 2064;
Cameron JBC 125; Archer PG 688;
Adamson J 539
2439–2743 m
Anthriscus sylvestris (L.) Hoffm. var.
sylvestris
Bytebier B *et al.* 45, 209
2400–2500 m
Diplolophium africanum Turcz.
Adamson J 561
2439–2439 m
Ferula communis L.
Kerfoot O 2026
2134–2134 m
Heteromorpha trifoliata (H.L.Wendl.)
Eckl. & Zeyh.

Bytebier B *et al.* 291; Bono G 21; Kerfoot
O 2027, 2028
2286–2439 m
Sanicula elata Buch.-Ham. ex D.Don
Bytebier B *et al.* 18
2400–2400 m

Torilis arvensis (Huds.) Link
Bytebier B *et al.* 264; Bussmann R 9784
2350–2450 m

URTICACEAE

Droguetia iners (Forssk.) Schweinf.
Bussmann R, Sight record
Girardinia diversifolia (Link) Friis
Bytebier B *et al.* 282
2350–2350 m
Laportea alatipes Hook.f.
Bytebier B *et al.* 3
2400–2400 m
First record for K1
Parietaria debilis G.Forst.
Bytebier B *et al.* 43
2400–2400 m
Pilea johnstonii Oliv.
Bussmann R, Sight record
2350–2550 m
Urera hypselodendron (A.Rich.) Wedd.
Bytebier B *et al.* 100
2500–2500 m
First record for K1

VERBENACEAE

Clerodendrum johnstonii Oliv.
Kerfoot O 1960
2439–2439 m
Clerodendrum myricoides (Hochst.) Vatke
Bytebier B *et al.* 322; Gilbert MG,
Gachathi FN & Gatheri GW 5200
1600–1600 m

VIOLACEAE

Viola abyssinica Oliv.
Bytebier B *et al.* 54; Kerfoot O 2102
2400–2743 m

VISCACEAE

Viscum triflorum DC.
Bytebier B *et al.* 290
2350–2350 m

Viscum tuberculatum A.Rich.

Bussmann R 9749

2350–2550 m

VITACEAE

Cyphostemma bambuseti (Gilg & Brandt)

Wild & R.B.Drumm.

Bytebier B *et al.* 285

2350–2350 m

First record for K1

Cyphostemma kilimandscharicum (Gilg)

Wild & R.B.Drumm.

Bytebier B *et al.* 49

2400–2400 m

Rhoicissus revoilii Planch.

Bytebier B *et al.* 293

1600–1600 m

MONOCOTYLEDONAE

ALOACEAE

Aloe

Bytebier B *et al.* 360

1600–1600 m

AMARYLLIDACEAE

Scadoxus multiflorus (Martyn) Raf.

Bytebier B *et al.* 256

2350–2350 m

ASPARAGACEAE

Asparagus africanus Lam.

Bytebier B *et al.* 183

2500–2500 m

Asparagus falcatus L. var. *ternifolius*

Jessop

Bytebier B *et al.* 270

2350–2350 m

ASPHODELACEAE

Bulbine abyssinica A.Rich.

Bytebier B *et al.* 151, 219; Bussmann R

9820

2450–2500 m

COMMELINACEAE

Aneilema leicocaula K.Schum.

Bussmann R, Sight record

2350–2550 m

Commelina africana L.

Bytebier B *et al.* 154

2500–2500 m

Commelina benghalensis Wall.

Kerfoot O 2092

2743–2743 m

Commelina foliacea Chiov.

Bytebier B *et al.* 36

2400–2400 m

Cyanotis foecunda Hassk.

Bytebier B *et al.* 343; Bussmann R 9781

1600–2450 m

CYPERACEAE

Cyperus

Bytebier B *et al.* 68

2400–2400 m

Cyperus comosipes Mattf. & Kük. ssp. *comosipes*

Bytebier B *et al.* 257

2350–2350 m

Cyperus dichroostachyus A.Rich.

Bytebier B *et al.* 234; Kerfoot O 1926

2500–2743 m

Cyperus impubes Steud.

Bytebier B *et al.* 261

2350–2350 m

Cyperus niveus Retz. var. *leucocephalus* (Kunth) Fossberg

Kerfoot O 1924

2743–2743 m

Cyperus rigidifolius Steud.

Bytebier B *et al.* 59, 159

2400–2500 m

Cyperus rohlfii Boeck.

Bytebier B *et al.* 342

1600–1600 m

Cyperus sesquiflorus (Torr.) Mattf. & Kük.

ssp. *appendiculatus* (K.Schum.) Lye

Bytebier B *et al.* 71

2400–2400 m

Cyperus niger Ruiz & Pav. ssp.

elegantulus (Steud.) Lye

Kerfoot O 1925

2743–2743 m

Schoenoxiphium lehmannii (Nees) Steud.

Bussmann R 9819

2350–2550 m

DRACAENACEAE

Dracaena afromontana Mildbr.

Bytebier B *et al.* 21

2400–2400 m

Dracaena ellenbeckiana Engl.

Bytebier B *et al.* 358

1600–1600 m

GRAMINEAE

Agrostis schimperana Steud.

Bytebier B *et al.* 228

2500–2500 m

Andropogon

Bytebier B *et al.* 153

2500–2500 m

Brachypodium flexum Nees

Bussmann R, Sight record

Bromus leptoclados Nees

Cameron JBC 116

2591–2591 m

Chloris roxburghiana Schult.

Bytebier B *et al.* 299

1600–1600 m

Cynodon nlemfuensis Vandyerst var.

nlemfuensis

Bytebier B *et al.* 284

2350–2350 m

Digitaria velutina (Forssk.) P.Beauv.

Bytebier B *et al.* 296

1600–1600 m

Ehrharta erecta Lam. var. *abyssinica*

(Hochst.) Pilg.

Bytebier B *et al.* 61; Kerfoot O 1930

2400–2743 m

Eleusine multiflora A.Rich.

Bytebier B *et al.* 166

2500–2500 m

First record for K1

Enteropogon macrostachyus K.Schum. ex

Engl.

Bytebier B *et al.* 306

1600–1600 m

Eragrostis schweinfurthii Chiov.

Bytebier B *et al.* 195

2500–2500 m

First record for K1

Eragrostis tenuifolia (A.Rich.) Steud.

Bytebier B *et al.* 89

2500–2500 m

Exothea abyssinica (A.Rich.) Andersson

Bytebier B *et al.* 211

2500–2500 m

Leptochloa rupestris C.E.Hubb.

Bytebier B *et al.* 303

1600–1600 m

First record for K1

Panicum deustum Thunb.

Bytebier B *et al.* 302

1600–1600 m

Panicum hymeniocilum Nees

Bytebier B *et al.* 229

2500–2500 m

First record for K1

Rhynchelytrum repens (Willd.) C.E.Hubb.

Bytebier B *et al.* 353

1600–1600 m

Sinarundinaria alpina (K.Schum.)

C.S.Chao & Renvoize

Bytebier B *et al.* 53

2400–2400 m

Sporobolus africanus (Poir.) Robyns &

Tournay

Bytebier B *et al.* 99

2500–2500 m

Stipa dregeana Steud. var. *elongata* (Nees)

Stapf

Bytebier B *et al.* 267

2350–2350 m

HYACINTHACEAE

Albuca abyssinica Jacq.

Bytebier B *et al.* 157

2500–2500 m

HYPOXIDACEAE

Hypoxis kilimanjarica Baker ssp.

kilimanjarica

Bytebier B *et al.* 90; Bussmann R 9776

2450–2500 m

First record for K1

Hypoxis obtusa Burch.

Bytebier B *et al.* 214

2500–2500 m

IRIDACEAE

Aristea alata Baker

Bytebier B *et al.* 79; Adamson J 535

2500–2743 m

Gladiolus goetzei Harms

Archer PG 701

2439–2439 m

Gladiolus newii Bak.

Bytebier B *et al.* 218

2500–2500 m

First record for K1

JUNCACEAE

Juncus oxycarpus Kunth

Bytebier *et al.* 81, Bussmann R9760

2450–2500 m

ORCHIDACEAE

Aerangis thomsonii (Rolfe) Schltr.

Adamson TG 534; Bytebier B *et al.* 102

2350–2743 m

Brownleea parviflora Lindl.

Kerfoot O 2100

2743–2743 m

Diaphananthe rohrii (Rchb.f.) Summerh.

Bytebier B *et al.* 131

2500–2500 m

First record for K1

Eulophia petersii Rchb.f.

Bytebier B *et al.* 144

1600–1600 m

Polystachya confusa Rolfe

Archer PG 713; Bytebier B *et al.* 110, 113,
132, 133

2400–2652 m

Polystachya piersii P.J.Cribb

Bytebier B *et al.* 101; Archer PG 709

2350–2350 m

Rangaeris amaniensis (Kraenzl.)

Summerh.

Bytebier B *et al.* 142

2250–2250 m