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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 (Mäckel, 1986; Mäckel & Schultka, 1983; Mäckel & 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 (Mäckel & 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 Synnott (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

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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).

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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 *et al.*	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 (Junipereteа /-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

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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 pedunculosum*. 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-Junipertum 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

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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, *Cadia 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 (Hagenietea 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 (Hagenio abyssinicae-Hypericetum revoluti BUSSMANN 1994).

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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

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
1600–2450 m

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

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DENNSTAEDTIACEAE
Hypolepis goetzei Reimers
Cameron JBC 139
2134–2134 m
Pteridium aquilinum (L.) Kuhn
Bytebier B *et al.* 194
2500–2500 m

DRYOPTERIDACEAE
Arachniodes foliosa (C.Chr.) Schelpe
Cameron JBC 130
2439–2439 m
Polystichum fuscopaleaceum Alston
Bytebier 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 Kunze
Bytebier 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 Baker
Bytebier 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 oppositiformis (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) Blasdell
Bytebier 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

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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 (Kl.) 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

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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 afromontanum 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

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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 Aiton
Bytebier B *et al.* 238
Kerfoot O 2099
2200–2743 m
Silene burchellii Otth 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
Mystroxylon 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) Mesfin
Bytebier 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. & Hiern
Bytebier 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.Walker
Bytebier 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.) Kuntze
Bytebier B *et al.* 35
2400–2400 m
Emilia discifolia (Oliv.) C.Jeffrey
Bytebier B *et al.* 245; Kerfoot O 2055; Gilbert MG, Gachathi FN & Gatheri GW 5198
1600–2439 m
Emilia somalensis (S.Moore) C.Jeffrey
Bytebier B *et al.* 80
2500–2500 m
Gerbera viridifolia (DC.) Sch.Bip.
Bytebier B *et al.* 178
2500–2500 m

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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.Burtt 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

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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

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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* Sebald
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 igniriaus (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

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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
Kotschya 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

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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 schimperi 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

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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

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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 volkensii 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

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RHIZOPHORACEAE
Cassipourea malosana (Baker) Alston
Bytebier B *et al.* 11
2400–2400 m
ROSACEAE
Alchemilla cryptantha A.Rich.
Bytebier B *et al.* 33
2400–2400 m
Prunus africana (Hook.f.) Kalkman
Bytebier 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.) Bridson
Bytebier 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.) Deflers
Bytebier B *et al.* 271
2350–2350 m
Pentas parvifolia Hiern
Bytebier 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 Petit
Bytebier B *et al.* 14; Kerfoot O 1953
2134–2400 m
Psydrax schimperiana (A.Rich.) Bridson ssp. *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 Delile
Bytebier B *et al.* 42, 172; Kerfoot O 1957
2400–2500 m
Teclea simplicifolia (Engl.) Verd.
Kerfoot O 1980
2286–2286 m
Vepris samburuensis Kokwaro
Bytebier B *et al.* 313
1600–1600 m

SALVADORACEAE
Salvadora persica L. var. *persica*

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Bono G 212
2000–2000 m

SANTALACEAE
Osyridicarpos 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 mochisia (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
Cycnium 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

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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.) Gilg
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

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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 leicocaule 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 rohlfsii 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.

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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 Vanderyst 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
Exotheca 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 hymeniochilum 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.

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Bytebier B *et al.* 218
2500–2500 m
First record for K1

JUNCACEAE
Juncus oyxcarpus 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

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