



## **Studies in the flora and vegetation of SW Ethiopia**

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Ib Friis, Finn N. Rasmussen and Kaj Vollesen

Friis, I., Rasmussen, F. N. & Wollesen, K. 1982. Studies in the flora and vegetation of southwest Ethiopia. – *Opera Botanica* 63: 1–70. Copenhagen. ISBN 87-7001-126-5.

The paper reports on the results of two periods of field work in the Kaffa, Illubabor, Sidamo and Shoa Provinces of Ethiopia. The natural conditions of the area are briefly outlined. Observations on the floristic composition of the following vegetation types are recorded: upland rain forest, upland dry evergreen forest, riverine forest, upland evergreen bushland, deciduous bushland, *Acacia abyssinica* woodland, deciduous woodland, upland grassland and seepage meadow. The forest flora is compared with that of the Sudan, Uganda and Kenya, and the tree flora is found to be poorer than in East Africa. The flora of the deciduous bushland is found to be particularly rich in endemic species. A selective list of species collected during the field work is included. It enumerates species which have not previously been reported from the provinces in floristic literature. Taxonomic changes are made where appropriate.

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Finally we want to thank Mr. M. G. Gilbert, Mr. Getachew Aweke, Mr. A. Hunde, and Mr. K. Jakobsen, who all took part in the field work, and Mrs. V. C. Friis who has corrected the English language.

# 1. Introduction

The flora of SW Ethiopia has until recently been among the least known in tropical Africa. Early travellers at the turn of the century, e.g. O. Neumann and F. Bieber, reported on vast expanses of rain forest through which it was only possible to penetrate by cutting one's way with a speed of 3 to 4 km a day (Engler 1906: 746-747). Unfortunately Neumann stopped making botanical collections before entering the forested area, and Bieber's very limited collections were left unidentified for c. 35 years, until they were finally published by Cufodontis (1948).

The bulk of early literature on the flora and vegetation of SW Ethiopia consists of a number of papers by Italian foresters, e.g. Giordano (1939, 1940), Senni (1940), and reports from Italian expeditions to the area (e.g. Cufodontis 1939, 1940). A summary with special emphasis on the forest trees was published by Logan (1946), who had visited a number of forests in Sidamo, and Belleta Forest in Kaffa. Pichi-Sermolli (1957a) concluded in his account of the SW Ethiopian montane moist evergreen forests that our knowledge of these was still very superficial, and a similar view was expressed by White (1970: 110).

During the 1960's access to SW Ethiopia by motor vehicle was greatly facilitated by the construction of new roads. This increased exploitation of the forests, but also botanical collecting was considerably eased. About 25 botanical collectors from Ethiopia, Europe and America have by now (1979) worked in the forests of SW Ethiopia, and their collections are becoming available in the National Herbarium, Addis Ababa (ETH), and in major European herbaria. Recent work by the Land Resources Development Centre of the British Ministry of Overseas Development has resulted in a better knowledge of the useful forest trees, but so far only a glossary of vernacular names has been published (Chaffey 1978).

The field work on which this paper is based was initiated in 1969 when the late Professor Th. Sørensen and Mr. Knud Jakobsen, both of the Institute of Systematic Botany, University of Copenhagen, made contact with Mr. M. G. Gilbert of the National Herbarium, University of Addis Ababa, and a scheme for a joint venture was agreed upon. An exploratory trip with Mr. Jakobsen, Mr. Ib Friis and Mr. Asfaw Hunde took place from October to December 1970. This was followed by

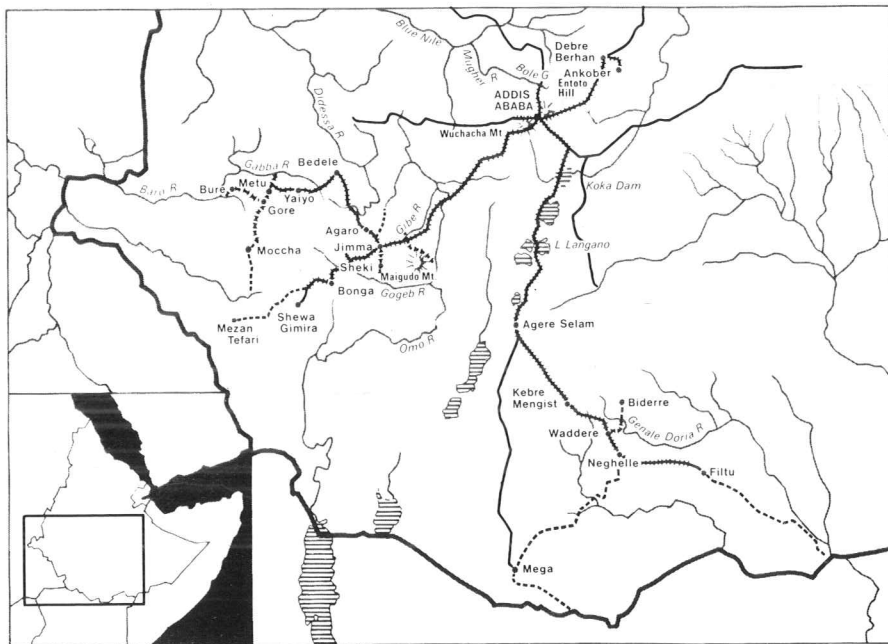


Fig. 1. Map of SW Ethiopia, showing itinerary of the two field trips. Dark, continuous lines: all-weather roads. Broken lines: dry-weather roads or tracks. Hatched lines: routes of the field trips.



Tab. 1. Itinerary. Only days with field works are recorded.

Date	Locality	Coll. nos.
1970		
31.10.-4.11.	Around Jimma	1- 102
5.11.	Bellesta Forest	103- 132
7. -8.11.	Around Jimma	133- 202
9. -10.11.	Bellesta Forest	203- 281
13.11.	Around Jimma	282- 291
15. -22.11.	Around Bonga	292- 416
25. -27.11.	Mt. Maigudo	417- 523
29.11.	Around Jimma	524- 528
1. -2.12.	Around Folla	529- 555
4. -7.12.	Around Metu and Gore	556- 596
9.12.	Around Jimma	597- 615
19.12.	Abbay Gorge	no coll.
1972		
29.10.	Awash River at Koka Dam	701- 729
1.11.	From Lake Langanano to Waddere	730- 770
2. -4.11.	Around Neghelle and Filtu	771-1044
5. -6.11.	From Waddere to Agere Selam	1045-1100
12. -13.11.	Bole Gorge	1101-1163
13. -14.11.	Entoto Hill and Addis Ababa	1164-1195
19.11.	Menagesha Forest	1196-1288
23.11.	Entoto Hill	1289-1327
26.11.	Around Ankober	1328-1373
1.12.	Jimma	1396-1401
2. -3.12.	Mt. Maigudo	1402-1549
5.12.	Giren and Jimma	1550-1602
7. -8.12.	Sheki and Gogeb River	1603-1695
12. -14.12.	Bedele to Metu	1696-1704
15.12.	Gabba River	1705-1763
16. -20.12.	Forests south of Gore	1764-1889
21. -22.12.	Bure and Baro River	1890-1941
23. -27.12.	Around Yaiyo	1942-2023
28.12.	At Didessa River	2024
1973		
1. -2.1.	Around Jimma	2025-2080
6. -22.1.	Around Bonga and return to Jimma	2081-2361

a longer trip from October 1972 to February 1973 in which the Danish members were Mr. Friis, Mr. Finn N. Rasmussen and Mr. Kaj Vollesen, with Mr. Gilbert and Mr. Getachew Aweke from the National Herbarium, Addis Ababa.

The scheme intended that field work should concentrate on the forests and the secondary vegetation replacing them, with some attention also given to adjoining vegetation types. Details of the itineraries are shown in Fig. 1 and listed in Tab. 1. A gazetteer of the localities mentioned in the text has been prepared as Tab. 2.

About 2400 numbers of plants were collected during the field work, as far as possible in seven sets, of which the main sets are at C, ETH, and K. Other sets are at BR, EA, FI, and WAG. Determination of the material has been undertaken at the Herbarium, Royal Botanic Gardens, Kew, and additional material has been seen at the British Museum (Natural History), London, Erbario Tropicale, Istituto Botanico, Florence, or received on

Tab. 2. Gazetteer of localities mentioned in the text.

Addis Ababa (Shoa)	9°02'N 38°42'E
Agere Selam (Sidamo)	6°30'N 38°31'E
Ankober (Shoa)	9°35'N 39°42'E
Aro (Kaffa)	7°48'N 36°46'E
Baro River, at bridge SW of Bure (Illubabor)	8°13'N 35°00'E
Bellesta Forest (Kaffa)	7°35'N 36°38'E
Bole, gorge or valley in the upper part of the Mughher River system (Shoa)	10°23'N 38°42'E
Bonga (Kaffa)	7°17'N 36°14'E
Bure (Illubabor)	8°20'N 35°10'E
Debre Berhan (shoa)	9°41'N 39°31'E
Didessa River, at bridge on the Jimma-Bedele road (boundary between Kaffa and Illubabor)	8°03'N 36°27'E
Enkulo (Kaffa)	7°48'N 36°45'E
Entoto Hill (Shoa)	9°06'N 38°42'E
Filtu (Sidamo)	5°07'N 40°40'E
Folla (Kaffa)	7°54'N 37°07'E
Gabba River, at bridge on the Metu-Gimbi track (Illubabor)	8°27'N 35°37'E
Genale Doria River, at bridge on the Waddere-Biderre track (boundary between Sidamo and Bale)	5°40'N 39°40'E
Giren (Kaffa)	7°42'N 36°54'E
Gogeb River, at bridge on the Jimma-Bonga road (Kaffa)	7°25'N 36°20'E
Gore (Illubabor)	8°09'N 35°33'E
Jimma (Kaffa)	7°40'N 36°50'E
Kebre Mengist (= Adola; Sidamo)	5°53'N 39°00'E
Kochi (Kaffa)	7°39'N 36°53'E
Koka Dam, on Awash River (Shoa)	8°40'N 39°10'E
Maigudo, Mt. (Kaffa)	7°26'N 37°10'E
Menagesha Forest (Shoa)	8°58'N 38°35'E
Metu (Illubabor)	8°20'N 35°35'E
Nadda (Kaffa)	7°36'N 37°10'E
Neghelle (Sidamo)	5°19'N 39°35'E
Nopa (Illubabor)	8°24'N 35°36'E
Sheki (Kaffa)	7°27'N 36°55'E
Waddere (Sidamo)	5°45'N 39°19'E
Yaiyo (Illubabor)	8°22'N 35°48'E
Yebu (Kaffa)	7°45'N 36°48'E

loan from other herbaria. The main work with the determination was made by Mr. Friis, Mr. Rasmussen and Mr. Vollesen. Critical ferns were named by Professor E. A. C. L. E. Schelpe, Bolus Herbarium, Cape Town, grasses were identified by Mr. S. Renvoize, Kew, and the Cucurbitaceae by Mr. C. Jeffrey, Kew. A number of other specialists at Kew and the British Museum (Natural History) have helped with the identification of individual genera and species, as will be seen from the list at the end of this paper.

Some observations, mainly the description of new species, have been published earlier by Friis (1971), Friis & Bjørnstad (1971), Friis (1974), Rasmussen (1974), Friis (1975), Friis & Gilbert (1976), Rasmussen (1978), and Friis (1979). Also the collections of bryophytes have been published separately (Bizot, Friis, Lewinsky & Pócs 1978). The collections of the genus *Ficus*, for which Mr. Aweke was largely responsible, have been used in a monograph of the Ethiopian species of *Ficus* (Aweke 1979).

## 2. Natural conditions of SW Ethiopia

### Physiographic units

Ethiopia consists basically of two high plateau regions, separated by the Rift Valley and bounded on all sides by lowland plains with an altitude from 200 to 500 m. The names given to the plateaus and massifs have varied considerably in the literature and on maps. A recent terminology, originating from the Department of Geography, University of Addis Ababa, has been adopted here (Wolde-Mariam 1970): all uplands and highlands west of the Rift Valley are collectively termed the North-Western Highlands. The large massif east of the Rift Valley and the chain of mountains continuing in a great curve through eastern Ethiopia and northern Somalia to the Indian Ocean are termed the

South-Eastern Highlands. The more detailed nomenclature appears from Fig. 2.

A few additional names are used here: the much dissected western escarpment of the NW Highlands is termed the W Escarpment, and the gently sloping south-eastern face of the SE Highlands is called the SE Slope.

### Geology

Pre-Cambrian rocks underlie all other rocks in Ethiopia and form a peneplained basement of extremely folded, metamorphosed sediments and igneous intrusions.

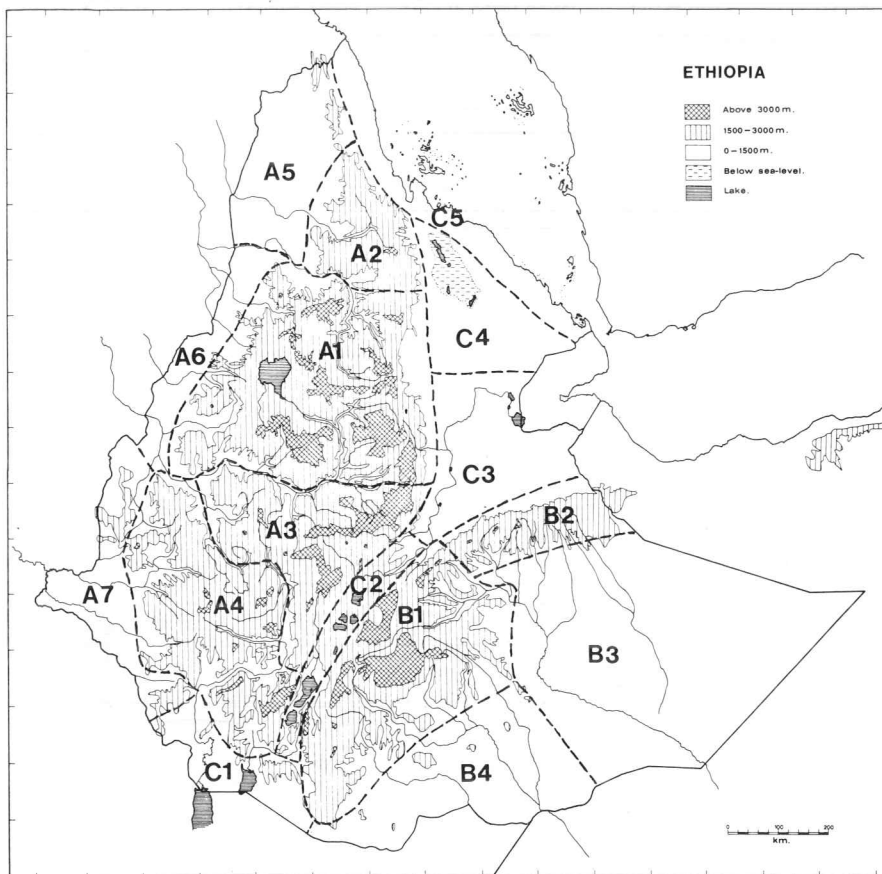


Fig. 2. Physiographic units of Ethiopia. A: North-Western Highlands and associated lowlands. A1: The North-Central Massif. A2: The Tigrayan Plateau. A3: The Shoa Plateau. A4: The South-Western Plateau. A5-A7: The Western Lowlands. A5: The Barka Lowland. A6: The Anghrib Lowland. A7: The Baro Lowland. B: The South-Eastern Highlands and associated lowlands. B1: The Arussi-Bale Massif. B2: The Harar Plateau. B3-B4: The South-East Slope. B3: The Shebelle Plain. B4: The Genale Plain. C: The Ethiopian Rift Valley. C1: The Ghibe Trough. C2: The Lake Region. C3: The Awash Valley. C4: The Afar Depression. C5: The Coastal Plain. Redrawn after Wolde-Mariam (1970).

These crystalline rocks are visible on the escarpments and in some of the deep river valleys. We observed such rocks while working N and W of Gore, between Kebre Mengist and Neghelle, and in some river gorges in Il-lubabor near Yaiyo.

The Mesozoic rocks consist of sandstone and limestone. They appear in deep river valleys of more central parts of the NW Highlands, and on the SE Slope. Mesozoic rocks are unknown on the part of the W Escarpment where we worked, but we observed layers of Adigrat sandstone of considerable thickness in the Bole Gorge, and Mesozoic limestone in the Abbay (Blue Nile) Valley and E of Neghelle.

The most important rocks of the Ethiopian Highlands are of volcanic origin and date mainly from the Tertiary (the Trap Series). This chiefly basaltic lava is of considerable thickness, reaching its maximum, 3000–3500 m, in the Semien Mts. but a thickness of 500–2500 m is more frequent. Most field work was carried out in areas of these basalts.

A recent survey of Ethiopian geology is given by Mohr (1971).

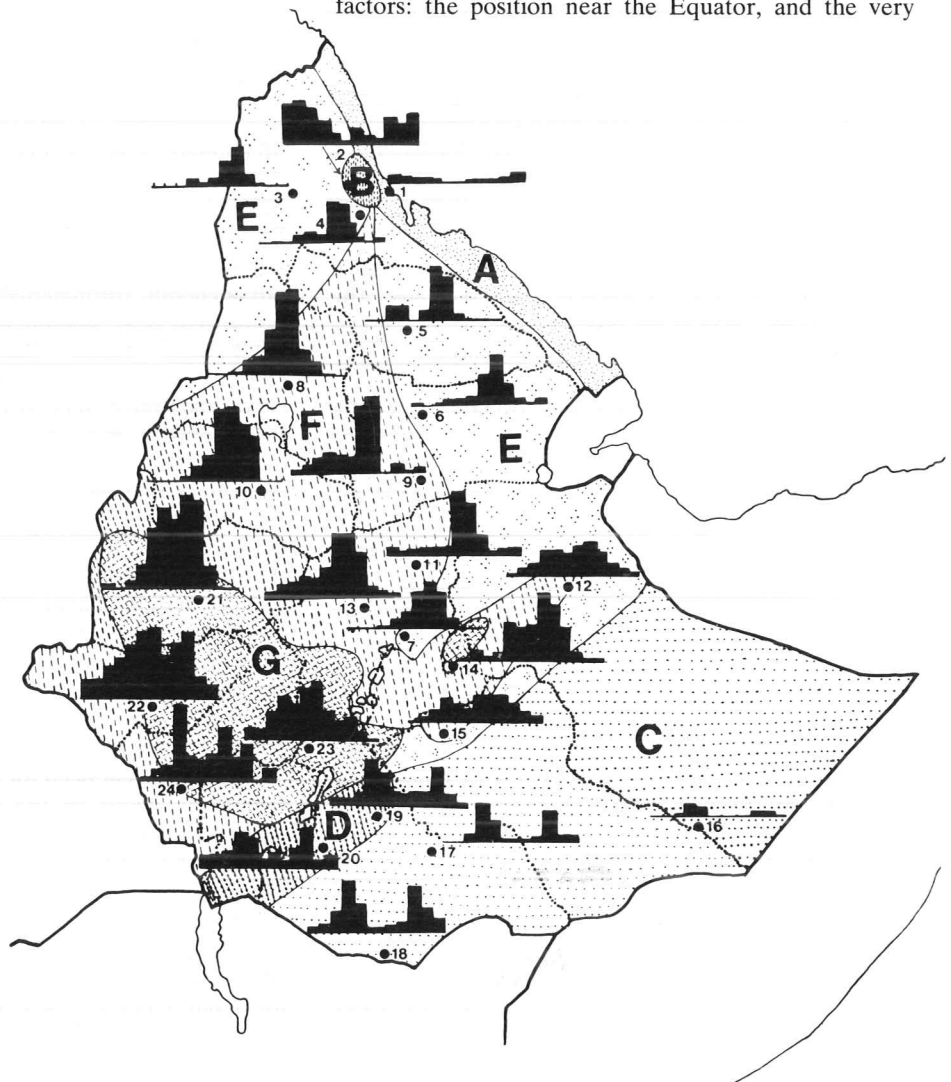
### Soils

The most common forest soils seen during the field work were red or brown ferrisols derived from volcanic parental material. In the area of Pre-Cambrian rocks on the W Escarpment yellow or brown loams were frequent, often with a considerable admixture of mica, indicating their derivation from crystalline rocks. A very schematic survey of African soils is given by D'Hoore (1964); a specialized study of montane forest soils in the Munessa Forest, Arussi Province, has been made by Lundgren (1971), but the results are still too isolated to allow any general conclusions to be drawn. The Munessa Forest soils are classified by Lundgren as intermediate between D'Hoore's humic ferrisols and ferri-sols on rocks rich in ferro-magnesian minerals.

### Climate

The climate of SW Ethiopia is governed by two main factors: the position near the Equator, and the very

Fig. 3. Rainfall regions of Ethiopia. A: Dry areas with winter rain. B: Wet areas with winter rain. C: Dry areas with spring and fall rain. D: Wet areas with spring and fall rain. E: Dry areas with summer rain. F: Wet areas with summer rain. G: Areas with rain most of the year. The variation of rainfall throughout the year is shown for a number of selected stations: 1: Massawa. 2: Filfil. 3: Agordat. 4: Asmara. 5: Mequle. 6: Qobba. 7: Nazret. 8: Gondar. 9: Desse. 10: Injabara. 11: Debre Berhan. 12: Harar. 13: Addis Ababa. 14: Gololcha. 15: Gobba. 16: Quellafo. 17: Neghelle. 18: Moyale. 19: Kebre Mengist. 20: Burji. 21: Ghimbi. 22: Ghecha. 23: Soddo. 24: Maji. Redrawn after Wolde-Mariam (1970).



Tab. 3. Average annual rainfall and temperature at some stations visited during the field work. Rainfall data from Griffith & Hemming (1963). Temperature data from Walter & Lieth (1960).

Station	Altitude m	Average annual rainfall (mm)	Average annual temperature (°C)
Addis Ababa	2408	1206	15.9
Entoto Hill	2650	1150	—
Ankober	2800	1659	—
Bure	1500	1347	—
Gore	2130	2002	—
Gecha §	2200	2186	—
Jimma	1740	1446	18.3
Bonga	1725	1690	—
Neghelle	1480	578	21.0

§ c. 70 km S of Gore.

complex relief. The temperature shows a very restricted seasonal variation, usually with a slight minimum during the rainy season when the sky is frequently overcast. Daily variation may, however, be considerable; at Addis Ababa the daily amplitude may be as much as 17°–18°C. The average annual temperature is mainly a function of the altitude, and is estimated to decrease with about 0.6°C per 100 m increase in height (Hahn 1908). Examples of average annual temperatures at stations visited during the field work are given in Tab. 3.

The rainfall of SW Ethiopia is largely dependent on the prevailing winds, of which two contrasting systems exist. In the summer, from May to October, the prevailing wind is south-westerly, from the high-pressure areas over the Equator. This moisture-laden wind produces rain over the escarpments and plateaus. The highest rainfall is near the SW point of the W Escarpment, where the ascent of the wind is sharpest.

In the winter months, from November to April, the prevailing winds are north-easterly, bringing very little moisture from the Red Sea. This moisture is soon shed over the escarpments of Eritrea, and very little rain falls on the plateaus during these months. However, on the SW Plateau rain may occur almost throughout the year; we experienced heavy thunderstorms during the field trip in January 1973. This may be due to local phenomena which we have been unable to trace in the literature, but the effect is that SW Kaffa and Illubabor receive not only the highest but also the most evenly distributed rainfall in Ethiopia (Fig. 3).

The exact size of the maximum annual rainfall in SW Ethiopia is still uncertain, because of insufficiently detailed records. Gecha, about 70 km S of Gore in Illubabor, has the highest recorded rainfall, 2186 mm (Table 3), but Mr. A. P. Wood of the University of Liverpool, who has carried out geographical studies in the forests S of Gore, estimates that the rainfall may locally exceed 2500 mm annually (Wood, personal communication).

On the S slope of the SE Highlands the rainfall is associated with the change between the two above mentioned wind systems, as it is in NE Kenya, and these

areas thus receive two periods of rain per annum, a heavier rainfall in the spring and a lighter fall in the autumn. The field trip to the area between Neghelle and Filtu coincided with the autumn rains.

## Vegetation

### Classification

The classification of the Ethiopian vegetation is still in a preliminary stage. A survey of what was known up to 1955 was published by Pichi-Sermolli (1957a) in the descriptions accompanying his geobotanical map of Ethiopia and Somalia. Pichi-Sermolli recognized 24 vegetations units for the mapping. His units are often physiognomic (formations), but some are more comprehensive (e.g. 'coastal formations'), and a few are associations rather than formations (e.g. the *Oxythenanthera* thicket or the *Arundinaria* forest).

An elaborated version of the scheme proposed by Pichi-Sermolli, but covering Ethiopia only, was introduced by Breitenbach (1963) in the introduction to his manual of indigenous trees of Ethiopia. Breitenbach lists a complex system of associations, which are arranged into series of successions, which again are fitted into Pichi-Sermolli's principal mapping units. This very detailed system of associations is documented with lists of species from each association, but it is not at all clear from which localities in Ethiopia or at which rainfall these lists have been recorded, nor is it indicated whether a particular association occupies a minute patch or a large area.

There is a great need for a classification of Ethiopian vegetation, based on the major physiognomic types, which would make it easy to compare with other E African countries. White (1970: 78–79) discussed the qualifications of a useful system of classification, and pointed out that the scheme proposed for E Africa by Greenway in 1943 is the only satisfactory general classification of African vegetation. It was used as a basis for White's (1970) classification of the vegetation of Malawi. It has also been used to standardize ecological

notes of the Flora of Tropical East Africa. It circulated as a typescript for a long time, but was finally published (Greenway 1973).

The following notes on various types of vegetation studied during the field work are classified according to the Greenway scheme, with minor modifications to fit local conditions.

#### General features

At the lowest altitudes of the SE Slope either deciduous bushland or dry scrub with trees prevail (Pichi-Sermolli's xerophilous open woodland or broken xerophilous open woodland).

Deciduous woodlands occur in the Rift Valley, on the W Escarpment, and in the deep river valleys. In the Rift Valley at Lake Langano we observed fine examples of *Acacia* woodland, in which the dominant species was *Acacia tortilis* (cf. Beals 1968), while broad-leaved deciduous woodland, dominated by species of *Combretum*, occurred on the hill slopes of the Rift (Pichi-Sermolli includes these woodlands in his unit Savanna (various types)). Both the *Acacia* and the broad-leaved woodland reappear in the large river valleys, e.g. in the Gibe (Upper Omo) Valley.

The broad-leaved deciduous woodlands on the W Escarpment are dominated by species of *Combretum*, *Lannea*, *Terminalia* and other deciduous broad-leaved species. Pichi-Sermolli classifies these in a distinct unit, the deciduous woodland.

At elevations between 1200 and 2200 m in humid areas of SW Ethiopia the natural vegetation is probably upland rain forest (Pichi-Sermolli's montane moist evergreen forest), with the exception of rocky slopes, river valleys, and other localities with local conditions unsuitable for dense forest. Large areas in these parts of Ethiopia are now cultivated, or the forest has been replaced with pasture land (upland grassland), or seral stages in the regrowth of forest, e.g. *Acacia abyssinica* woodland or the humid type of upland evergreen bush-

land. Pichi-Sermolli classifies the pasture land as montane savanna, probably because of the occurrence of isolated trees (e.g. *Acacia abyssinica*) or shrubs (e.g. *Carissa edulis* or species of *Maytenus*); the *Acacia abyssinica* woodland is included in his montane evergreen forest as an association, the *Acacia xiphocarpa* (= *A. abyssinica*) forest. The humid evergreen bushland is included in his montane evergreen thicket and scrub.

Under drier conditions and at higher elevations the forest becomes increasingly dominated by the conifers *Podocarpus gracilior* and *Juniperus procera*. Such forests are classified by Greenway as upland dry evergreen forests, equalling Pichi-Sermolli's montane dry evergreen forest. The forests E of the Rift Valley are often dominated by *Podocarpus gracilior*, whereas forests at higher elevations (between 2200 and 3200 m) are dominated by *Juniperus procera*. On yet drier sites, with rainfall not exceeding c. 1100 mm, *Juniperus procera* forest is dominant also at lower altitudes. In most places these coniferous forests have been replaced by drier types of upland evergreen bushland (included in Pichi-Sermolli's montane evergreen thicket and scrub).

At the upper limit the forests are often mixed with *Hagenia abyssinica* and woody species of *Hypericum*, but a distinct *Hagenia-Hypericum* zone (Hedberg 1951), as on the E African mountains, has not been recorded from Ethiopia. *Arundinaria alpina* K. Schum., the mountain bamboo, which in E Africa forms the distinct Bamboo zone in close association with the *Hagenia-Hypericum* zone, occurs in Ethiopia in less regular patches on the wetter side of the mountains. The stands of *Arundinaria* can be almost pure, or mixed with *Hagenia*, *Erica arborea* L. and other shrubs (moist bamboo thicket, or, according to Pichi-Sermolli, Bamboo forest).

Above 3200 m moor grassland and upland moors dominate the landscape, with large *Carex* bogs and scrubs of *Erica arborea*, *Philippia*, or *Blaeria* (classified together by Pichi-Sermolli as altimontane scrub and steppe). Examples of these vegetation types have been analysed by Hedberg (1971).

### 3. Observations on the floristic composition of selected formations

The floristic composition of a number of formations was studied during the field work. These observations are described here in the sequence suggested by Greenway (1973). Because of the strong human influence on most vegetation in Ethiopia, formations are often mixed in a way which is difficult to perceive in the field. It is often difficult to decide whether a particular species is a natural component of the vegetation, or its presence is due to the activity of man. The lists given below represent our observations, with as much editing as we have found justifiable in order to give a coherent picture of the vegetation. The field work was concentrated on the

forests. Bushlands and woodlands were studied whenever possible without infringing on the main topic of the expedition. The lists represent only a restricted number of localities, selected to show most clearly what we consider typical vegetation types. For this reason there is not complete concord between species mentioned in this chapter and species mentioned in the list of floristic and taxonomic observations at the end of the paper. A species in the latter list may not necessarily be included here, either because it was observed in localities omitted from this chapter, or because it is not considered a typical member of the particular vegetation.

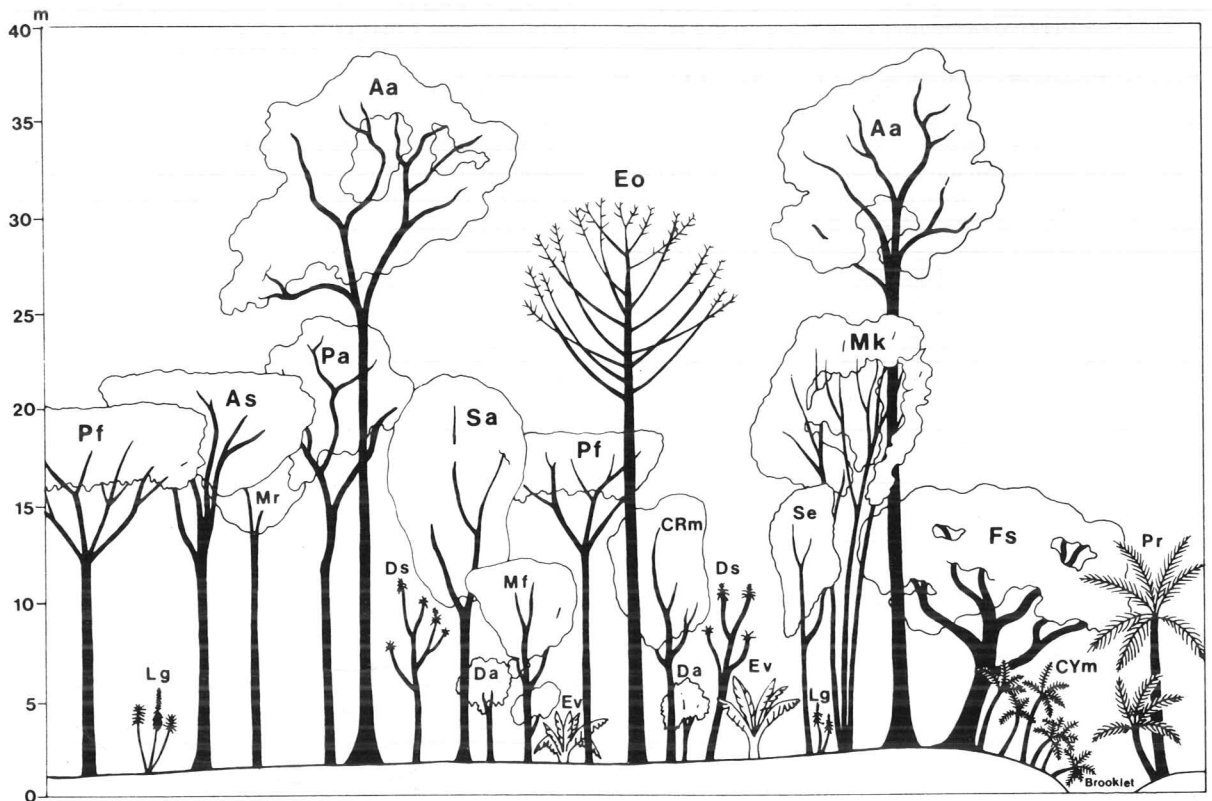


Fig. 4: Transection of upland rain forest about 20 km S of Gore (Illubabor) at 1700 m. The abbreviations stand for: Aa: *Aningeria adolfi-friedericii*. As: *Albizia schimperana*. CRm: *Croton macrostachyus*. CYm: *Cyathea manniana*. Da: *Dracaena afromontana*. Ds: *Dracaena steudneri*. Eo: *Euphorbia obovalifolia*. Ev: *Ensete ventricosum*. Fs: *Ficus sur*. Lg: *Lobelia giberroa*. Mf: *Milletia ferruginea*. Mk: *Macaranga kilimandscharica*. Mr: *Mitragyna rubrostipulata*. Pa: *Prunus africanus*. Pf: *Polyscias fulva*. Pr: *Phoenix reclinata*. Sa: *Schefflera abyssinica*. Se: *Sapium ellipticum*.

Tab. 4. Floristic composition of upland rain forest.

A. Forests south and east of Gore, towards Yaiyo (Illubabor), 1400–1800 m.

B. Forests at Bonga (Kaffa), 1700–1800 m.

C. Bellela Forest (Kaffa), c. 2000 m.

D. 'Coffee forests' at Jimma and Bonga (Kaffa), 1700–1800 m.

E. Forests between Agere Selam and Kebre Mengist (Sidamo), 2100–2650 m.

\*Indicates that the species is associated with streams.

	A	B	C	D	E		A	B	C	D	E
Emergent trees (30 m or more)						Pachycaul ferns					
<i>Aningeria adolfti-friedericii</i> . . . . .	x	x	x	.	.	<i>Cyathea manniana</i> * . . . . .	x	x	.	.	.
Medium sized trees (10–30 m)						Pachycaul seed plants					
<i>Albizia gummifera</i> . . . . .	x	x	x	x	.	<i>Dracaena afromontana</i> . . . . .	x	x	x	.	.
<i>A. schimperana</i> . . . . .	x	x	x	x	.	<i>D. fragrans</i> . . . . .	x	.	.	.	.
<i>Blighia unijugata</i> * . . . . .	x	.	.	.	.	<i>D. steudneri</i> . . . . .	x	x	x	x	.
<i>Cassipourea malosana</i> . . . . .	x	.	.	.	.	<i>Ensete ventricosa</i> . . . . .	x	x	x	.	.
<i>Celtis africana</i> . . . . .	x	x	x	x	x	<i>Lobelia giberroa</i> . . . . .	x	x	x	x	.
<i>Cordia abyssinica</i> . . . . .	.	.	x	x	.	<i>Phoenix reclinata</i> * . . . . .	x	x	x	.	.
<i>Croton macrostachyus</i> . . . . .	x	x	x	x	x	<i>Senecio gigas</i> . . . . .	x	x	x	.	.
<i>Ekebergia capensis</i> . . . . .	.	.	x	x	.	Shrubs					
<i>Euphorbia obovalifolia</i> . . . . .	x	x	x	x	.	<i>Acanthus eminens</i> . . . . .	x	x	x	.	.
<i>Ficus exasperata</i> . . . . .	x	.	.	.	.	<i>Cassia peteriana</i> . . . . .	x	.	.	.	.
<i>F. sur</i> * . . . . .	x	x	x	.	.	<i>Discopodium penninervium</i> . . . . .	.	.	.	.	x
<i>F. thonningii</i> . . . . .	x	x	x	x	.	<i>Maytenus arbutifolius</i> . . . . .	x	.	.	.	.
<i>Ilex mitis</i> . . . . .	.	.	x	x	x	<i>M. arguta</i> . . . . .	.	.	.	.	x
<i>Macaranga kilimandscharica</i> . . . . .	x	x	x	x	.	<i>M. obscura</i> . . . . .	x	x	.	.	.
<i>Mitragyna rubrostipulata</i> . . . . .	x	.	.	.	.	<i>Phyllanthus limuensis</i> . . . . .	x	x	.	.	.
<i>Ocotea kenyensis</i> . . . . .	.	.	x	.	.	<i>Premna schimperi</i> . . . . .	.	.	x	.	.
<i>Olea hochstetteri</i> . . . . .	.	.	.	.	x	<i>Psychotria peduncularis</i>	.	.	.	.	.
<i>O. welwitschii</i> . . . . .	x	x	x	.	.	var. <i>ciliato-stipulata</i> . . . . .	x	x	.	.	.
<i>Podocarpus gracilior</i> . . . . .	.	.	.	x	x	<i>Turraea holstii</i> . . . . .	x	.	.	.	.
<i>Polyscias fulva</i> . . . . .	x	x	x	x	.	<i>Whitfieldia elongata</i> . . . . .	x	.	.	.	.
<i>Prunus africana</i> . . . . .	x	x	x	x	.	Lianas					
<i>Sapium ellipticum</i> . . . . .	x	x	.	x	.	<i>Combretum paniculatum</i> . . . . .	x	x	x	.	.
<i>Schefflera abyssinica</i> . . . . .	x	x	x	x	x	<i>Dalbergia lactea</i> . . . . .	x	x	x	.	.
<i>S. volkensii</i> . . . . .	.	.	.	.	x	<i>Gouania longispicata</i> . . . . .	x	x	x	.	x
<i>Syzygium guineense</i> ssp. <i>afromontanum</i> . . . . .	x	x	x	x	.	<i>Hippocratea africana</i> . . . . .	x	x	x	.	.
<i>Trichilia dregeana</i> . . . . .	x	.	.	.	.	<i>H. goetzei</i> . . . . .	x	x	.	.	.
Small trees (less than 10 m)						<i>Jasminum abyssinicum</i> . . . . .	x	x	.	.	.
<i>Allophylus abyssinicus</i> . . . . .	x	x	x	x	x	<i>Landolphia buchananii</i> . . . . .	x	x	x	.	.
<i>Apodytes dimidiata</i> . . . . .	.	.	x	.	.	<i>Paullinia pinnata</i> . . . . .	x	x	.	.	.
<i>Bersama abyssinica</i> . . . . .	x	x	x	x	x	<i>Tiliacora troupinii</i> . . . . .	x	x	x	.	.
<i>Brucea antidysenterica</i> . . . . .	x	x	x	x	x	<i>Uncaria africana</i> . . . . .	x	.	.	.	.
<i>Calpurnia aurea</i> . . . . .	.	.	.	.	x	<i>Urera hypselodendron</i> . . . . .	x	x	x	.	x
<i>Canthium ruwenzoriense</i> * . . . . .	x	x	x	.	.	Pseudolianas					
<i>Chionanthus mildbraedii</i> . . . . .	x	x	x	.	.	<i>Acacia</i> cf. <i>montigena</i> . . . . .	x	.	.	.	.
<i>Clausena anisata</i> . . . . .	x	x	x	x	x	<i>Embelia schimperi</i> . . . . .	x	x	x	.	.
<i>Coffea arabica</i> . . . . .	x	.	.	.	.	<i>Rubus apetalus</i> . . . . .	x	x	x	x	.
<i>Crassocephalum mannii</i> . . . . .	x	x	x	.	.	<i>R. steudneri</i> . . . . .	.	.	.	.	.
<i>Deinbollia kilimandscharica</i> . . . . .	x	x	x	x	.	<i>Schefflera myriantha</i> . . . . .	x	x	x	.	.
<i>Ehretia cymosa</i> . . . . .	x	x	x	x	.	Herbaceous vines					
<i>Erythrina brucei</i> . . . . .	.	.	.	.	.	<i>Basella alba</i> . . . . .	.	x	.	.	.
<i>Erythrococca trichogyne</i> . . . . .	.	.	.	.	x	<i>Culcasia scandens</i> . . . . .	.	x	x	.	.
<i>Galiniera coffeoides</i> . . . . .	.	.	.	.	x	<i>Dolichos sericeus</i> . . . . .	.	x	x	.	.
<i>Hagenia abyssinica</i> . . . . .	.	.	.	.	x	<i>Lagenaria abyssinica</i> . . . . .	.	.	.	x	.
<i>Hypericum quartianum</i> . . . . .	.	.	.	.	x	<i>Oreosyce africana</i> . . . . .	.	.	.	.	x
<i>H. revolutum</i> . . . . .	.	.	.	.	x	<i>Pentarrhinum insipidum</i> . . . . .	.	.	.	.	x
<i>Lepidotrichilia volkensii</i> . . . . .	x	x	x	x	x	<i>Peponium vogelii</i> . . . . .	.	.	.	.	x
<i>Millettia ferruginea</i> . . . . .	x	x	x	x	.	<i>Stephania abyssinica</i> . . . . .	.	.	.	.	x
<i>Nuxia congesta</i> . . . . .	x	x	x	x	x	<i>Sericostachys tomentosa</i> . . . . .	.	.	.	.	x
<i>Oncoba routledgei</i> . . . . .	.	.	.	.	.	<i>Zehneria minutiflora</i> . . . . .	.	.	.	.	x
<i>Oxyanthus speciosus</i> ssp. <i>stenocarpus</i> . . . . .	x	x	x	.	.	Epiphytes					
<i>Pittosporum mannii</i> ssp. <i>ripicolum</i> . . . . .	x	x	x	.	.	Ferns & fern allies					
<i>Psychotria orophila</i> . . . . .	x	x	x	.	.	<i>Antrophyum mannianum</i> . . . . .	.	x	.	.	.
<i>Ritchiea albersii</i> . . . . .	x	x	.	.	.	<i>Asplenium aethiopicum</i> . . . . .	.	.	.	.	x
<i>Rothmannia urcelliformis</i> . . . . .	x	x	.	.	.	<i>A. anisophyllum</i> . . . . .	.	.	.	.	x
<i>Sesbania dummeri</i> * . . . . .	x	x	.	.	.						
<i>Teclea nobilis</i> . . . . .	x	.	.	.	.						
<i>Trema orientalis</i> . . . . .	x	x	x	.	.						
<i>Vepris dainellii</i> . . . . .	x	x	x	.	.						

	A	B	C	D	E		A	B	C	D	E
<i>A. buetneri</i>					×	<i>D. kilemensis</i>		×			
<i>A. ceii</i>	×	×				<i>Marattia fraxinea*</i>	×	×			
<i>A. erectum</i>	×					<i>Microlepia speluncae</i>		×			
<i>A. friesiorum</i>		×				<i>Nephrolepis undulata</i>	×	×	×		
<i>A. lunulatum</i>			×			<i>Polysticum setiferum</i>					
<i>A. mannii</i>	×	×				<i>var. fuscopaleaceum</i>		×			
<i>A. sandersonii</i>		×				<i>Pteris dentata</i>		×			
<i>Drynaria volkensii</i>	×	×	×	×	×	<i>P. pteridioides</i>	×		×		
<i>Elaphoglossum deckenii</i>	×	×				<i>P. quadriaurita</i>	×		×		
<i>E. lastei</i>	×					<i>Selaginella kalbreyeri</i>		×			
<i>Hymenophyllum capillare</i>		×				<i>S. kraussiana</i>	×				
<i>H. polyanthos</i>		×				<i>Tectaria gemmifera</i>	×	×	×		
<i>Loxogramme lanceolata</i>		×			×	<i>Thelypteris bergiana</i>	×				
<i>Loxoscaphe nigrescens</i>	×	×				<i>T. longicuspis</i>		×			×
<i>L. theciferum</i>				×	×	<i>T. madagascariensis</i>	×	×			
<i>Lycopodium dacrydioides</i>	×	×	×	×	×						
<i>L. ophioglossioides</i>		×		×		Seed plants					
<i>L. verticillatum</i>		×				<i>Acalypha psilostachya</i>		×			×
<i>Oleandra distenta</i>		×			×	<i>Acanthopale</i> sp.		×			
<i>Pleopeltis excavata</i>				×		<i>Achyrosperrum parviflorum</i>	×				
<i>P. macrocarpa</i>				×	×	<i>A. schimperii</i>					×
<i>Pyrosia schimperana</i>				×		<i>Acritochaete volkensii</i>		×			×
<i>Trichomanes pyxidiferum</i>						<i>Aeschynomene abyssinica</i>		×	×		
<i>var. melanotrichum</i>	×	×				<i>Aframomum korarima</i>		×			
<i>Vittaria guineensis</i> var. <i>orientalis</i>	×	×				<i>A. zambesiacum</i>		×			
<i>V. volkensii</i>		×		×		<i>Agrocharis incognita</i>			×	×	
Seed plants						<i>Ajuga alba*</i>		×	×	×	×
<i>Angraecum humile</i>		×				<i>Alchemilla fischeri*</i>		×	×	×	×
<i>Bulbophyllum lupulinum</i>	×					<i>Amorphophallus gombozianus</i>			×		
<i>B. schlechteri</i>	×					<i>Aneilema pedunculatum</i>		×			
<i>Coleochloa abyssinica</i>	×					<i>Ardisiandra sibthorpioides</i>		×	×	×	×
<i>Diaphanathe adoxa</i>	×	×	×			<i>Arisaema schimperianum</i>					×
<i>D. tenuicalcar</i>					×	<i>Arthraxon quartinianus</i>		×	×	×	×
<i>Liparis deistelii</i>	×	×				<i>Beckeropsis uniseta</i>		×			
<i>Loranthus globiferus</i>				×		<i>Begonia wollastonii*</i>			×		
<i>L. woodfordioides</i>			×	×		<i>Brillantaisia madagascariensis</i>		×	×		
<i>Microcoelia guyoniana</i>	×	×	×	×		<i>Cardamine africana</i>			×	×	×
<i>Oberonia disticha</i>				×		<i>C. trichocarpa</i>				×	
<i>Peperomia abyssinica</i>	×	×	×	×	×	<i>Carex chlorosaccus</i>			×		
<i>P. tetraphylla</i>	×	×	×	×	×	<i>Celosia schweinfurthii</i>					×
<i>Polystachya ethiopica</i>	×			×		<i>Cheirostylis lepida</i>			×		
<i>P. bennettiana</i>	×	×		×		<i>Chloachne oplismenoides</i>		×	×	×	
<i>P. caduca</i>					×	<i>Chlorophytum sparsiflorum</i>		×	×	×	
<i>P. concreta</i>	×					<i>Costus afer</i>		×			
<i>P. erythrochila</i>				×		<i>Crassula alsinoides</i>		×	×	×	
<i>P. golungensis</i>			×			<i>Crotalaria quartiniana</i>		×	×		
<i>Scadoxus nutans</i>	×	×	×	×		<i>Cyathula achyranthoides</i>					×
Bamboos						<i>C. prostrata</i>		×			
<i>Arundinaria alpina</i>					×	<i>Cynorkis anacamptoides</i>			×	×	
Ground herbs						<i>Cyperus dereilema*</i>		×			
Ferns & fern allies						<i>Digitaria ternata</i>					×
<i>Adiantum phillipense</i>	×					<i>D. velutina</i>					×
<i>A. thalictroides</i>			×			<i>Dorstenia soerenzenii</i>			×		
<i>Arthropteris monocarpa</i>					×	<i>Droguetia iners</i>		×	×		
<i>A. orientalis</i>	×	×				<i>Drymaria cordifolia</i>		×	×	×	×
<i>Asplenium abyssinicum</i>		×				<i>Elatostema orientale*</i>		×	×	×	
<i>A. bugoiense</i>	×		×			<i>Eragrostis kiwiensis</i>					×
<i>A. inaequilaterale</i>	×					<i>Festuca abyssinica</i>					×
<i>A. linckii</i>		×				<i>Geranium aculeolatum</i>		×			
<i>A. protensum</i>	×				×	<i>G. arabicum</i>					×
<i>Athyrium scandicinum</i>	×					<i>Hydrocotyle mannii</i>		×	×	×	×
<i>Blottiella glabra*</i>	×					<i>Hygrophila auriculata*</i>		×			
<i>Cheilanthes farinosa</i>			×		×	<i>Hypericum peplidifolium*</i>		×		×	
<i>Coniogramme africana</i>	×	×				<i>Impatiens ethiopica*</i>		×	×	×	
<i>Ctenitis cirrhosa</i>		×				<i>I. hochstetteri</i>					×
<i>Didymochlaena truncatula*</i>	×					<i>I. tinctoria</i> ssp. <i>abyssinica</i>					×
<i>Doryopteris concolor</i>	×					<i>Isoglossa</i> sp. nov.?		×	×	×	
<i>Dryopteris inaequalis</i>					×	<i>Kyllinga elatior*</i>		×	×		
						<i>Lobelia holstii</i>					×
						<i>L. scebelii</i>					×
						<i>Marantochloa leucantha</i>		×			



	A	B	C	D	E		A	B	C	D	E
<i>Melastomastrum capitatum</i> . . . . .	x	.	.	.	.	<i>Polygonum nepalense*</i> . . . . .	x	x	x	.	x
<i>Mimulopsis solmsii</i> . . . . .	x	x	.	.	.	<i>P. salicifolium*</i> . . . . .	.	x	.	.	.
<i>Monopsis stellarioides</i> . . . . .	x	x	x	.	x	<i>P. setosulum*</i> . . . . .	x	.	.	.	.
<i>Oeceoclades saundersiana</i> . . . . .	x	.	.	.	.	<i>Pouzolzia parasitica</i> . . . . .	x	x	.	.	.
<i>Oldenlandia goreensis</i> . . . . .	x	.	.	.	x	<i>Pseudechinolaena polystachya</i> . . . . .	.	.	.	x	.
<i>O. lancifolia</i> . . . . .	x	x	.	.	.	<i>Ranunculus multifidus*</i> . . . . .	.	x	x	.	x
<i>O. monanthos</i> . . . . .	.	x	.	.	x	<i>Sanicula elata</i> . . . . .	x	x	x	.	x
<i>Olyra latifolia</i> . . . . .	x	.	.	.	.	<i>Satureja biflora</i> . . . . .	.	.	.	.	x
<i>Oplismenus compositus</i> . . . . .	.	x	.	x	x	<i>S. pseudosimensis</i> . . . . .	.	.	.	.	x
<i>O. hirtellus</i> . . . . .	x	.	.	.	.	<i>Scadoxus multiflorus</i> . . . . .	.	x	.	.	.
<i>Panicum calvum</i> . . . . .	x	x	.	.	.	<i>Schizachyrium brevifolium</i> . . . . .	x	x	.	x	.
<i>P. hymenochilum</i> . . . . .	.	x	.	.	.	<i>Scirpus setaceus</i> . . . . .	.	.	.	.	x
<i>P. monticulum</i> . . . . .	x	x	x	x	.	<i>Setaria candula</i> . . . . .	.	.	x	.	.
<i>P. pusillum</i> . . . . .	x	.	.	.	x	<i>Smithia eliottii*</i> . . . . .	.	x	.	.	.
<i>Parochaetus communis</i> . . . . .	.	x	x	.	x	<i>Spermacoce princeae</i> . . . . .	x	x	.	.	.
<i>Pennisetum giganteum</i> . . . . .	.	x	.	.	.	<i>Sporobolus africanus</i> . . . . .	.	.	.	.	x
<i>P. trachyphyllum</i> . . . . .	.	x	.	.	.	<i>S. piliferus</i> . . . . .	.	.	.	.	x
<i>Phaulopsis imbricata</i> . . . . .	x	x	x	.	.	<i>Stellaria mannii</i> . . . . .	x	.	.	.	.
<i>Pilea cf. bambusetii*</i> . . . . .	.	x	x	.	.	<i>S. sennii</i> . . . . .	x	x	.	.	.
<i>P. rivularis*</i> . . . . .	x	x	x	.	.	<i>Streptocarpus phaeotrichus*</i> . . . . .	.	x	.	.	.
<i>P. tetraphylla*</i> . . . . .	x	x	x	x	.	<i>Swertia abyssinica</i> . . . . .	.	.	.	.	x
<i>Piper capense</i> . . . . .	x	x	x	.	.	<i>Thalictrum rhynchocarpum*</i> . . . . .	x	x	x	.	.
<i>P. umbellatum</i> . . . . .	x	.	.	.	.	<i>Veronica abyssinica</i> . . . . .	.	.	.	.	x
<i>Plantago palmata*</i> . . . . .	.	x	x	x	x	<i>Viola abyssinica</i> . . . . .	x	.	.	.	x
<i>Plectranthus sylvestris</i> . . . . .	x	.	.	.	.	<i>Uebelinia abyssinica</i> . . . . .	.	.	.	.	x
<i>Poa schimperana</i> . . . . .	.	.	.	.	x	<i>U. erlangeriana</i> . . . . .	.	.	.	.	x

## Forests

The forests of Ethiopia may be referred to the following formation types of Greenway: lowland rain forest, upland rain forest, upland dry evergreen forest and riverine forest. The lowland rain forest, which is found at altitudes between 600 and 1000 m in western Illubabor (Chaffey, pers. comm.), was not visited during our field work and will not be dealt with here. In Ethiopia the upland rain forests are connected with the upland dry evergreen forests by a number of intermediate types, particularly mixed forests with *Podocarpus gracilior*. Forests with *Podocarpus gracilior* mixed with non-coniferous species are here classified with the upland rain forests, whereas forests dominated by *Podocarpus gracilior* and *Juniperus procera* are referred to the upland dry evergreen forests.

In our concluding section it has been attempted to place the Ethiopian forests in a wider East African context by a comparison of the dominant woody species.

### Upland rain forest

Large areas of upland rain forest were studied in Illubabor, south and east of Gore and towards Yaiyo. Smaller areas were studied in Kaffa at Bonga, Belleta and around Jimma. In the latter area the forests are mostly transformed into semi-natural 'coffee forests' where the shrub layer has been cleared and replaced by coffee plants (*Coffea arabica*). In Sidamo upland rain forest was studied between Agere Selam and Kebre Mengist. Species observed in these forests are recorded in Tab. 4. Some localities and characteristic species are shown in Figs. 5-9.

The forests at Gore are the richest in species and also have the best developed stratification. A transection is shown as Fig. 4. The rainfall in the area is high (see Tab. 3) and evenly distributed throughout the year (Fig. 2). The substrate is mostly basalts, with crystalline rocks in the valleys. The forests of Kaffa are very similar, but have a slightly lower rainfall.

Most species of forest trees appeared to be evergreen, but a few are reported to lose their leaves for a few days (White 1970).

*Aningeria adolfi-friedericii* (Fig. 6) is the only emergent species, reaching a height of 30-40 m. It forms the highest non-continuous stratum of the forest. A continuous stratum at 10-30 m above the forest floor consists of 10-20 species of trees, all with a comparatively similar appearance (Fig. 7), with the exception of the candelabra-shaped *Euphorbia obovalifolia* (Fig. 8) and the umbel-shaped *Polyscias fulva* (Fig. 6). These two species are most frequent in recently disturbed forest, but persist in the canopy of more mature secondary forest.

About 20 species of small trees form a usually discontinuous stratum at 5-10 m above the forest floor. This stratum is poorly differentiated from the shrub layer, which is rather poor in species. Pachycauls may form dense clumps in these strata, particularly *Dracaena fromontana* is common.

Lianas and pseudolianas were common along forest edges, but not dominant in high forest.

The herbaceous stratum on the forest floor is rich in species, but mostly discontinuous in mature forest. Several species of large, often turgid herbs, e.g. the ferns *Didymochlaena truncatula* and *Marattia fraxinea*, or the seed plants *Aframomum korarima* and *Amorphophallus*



Fig. 5. Upland rain forest at Bonga (Kaffa) at 1750 m. *Phoenix reclinata* and *Dracaena steudneri* are frequent along the river in the central part of the picture.



Fig. 6. Large specimen of *Aningeria adolfi-friedericii* in forest near Folla (Kaffa) at 2300 m. To the right a specimen of *Polyscias fulva*.

*gombozianus* occur but are not frequent. Broad-leaved grasses, e.g. *Olyra latifolia*, *Panicum monticolum*, and *Chloachne oplismenoides*, are frequent in most places. The richest flora in this stratum is found along small streams on the forest floor; species particularly associated with this habitat are indicated in Table 4. Also the pachycauls *Phoenix reclinata* and *Cyathea manniana* are associated with small streams or pools.

Epiphytes are frequent, particularly ferns, species of *Peperomia* and orchids. *Scadoxus nutans* (Fig. 9) is common on horizontal branches. The number of species in this group is almost certainly larger than indicated in Table 4 because of collection difficulties.

It could be asked whether this sample is representative for the large upland rain forests of Kaffa and Illubabor. A comparison with the work of Logan (1946), and two early Italian foresters, Senni and Giordano, shows that we have observed more tree species than any of these collectors. There are, however, a few apparently rare species which were not recorded by us. Senni (1940) studied a forest at Iechi, located c. 100 km south of Gore at ca. 1600 m. Senni's collections have been

studied at FI, and it can therefore be confirmed that he observed *Aningeria altissima* ('*Pouteria*'), *Manilkara botugi* and *Trilepisium madagascariense* ('*Bosqueia phoberos*'). Giordano (1939 & 1940) recorded from similar altitudes *Morus mesozygia* and *Fagaropsis angolensis* ('*Clausenopsis a.*').

It may be assumed that other species of forest trees exist, particularly on the west-facing slope of the SW plateau.

The upland rain forest between Agere Selam and Kebre Mengist (Sidamo) occurs at higher altitudes and at lower rainfall (see Table 3.). *Podocarpus gracilior* is very frequent in these forests and often reaches a height of 30 m. The canopy of mediumsized trees and the lower strata of woody plants are poorer in species here than in Kaffa and Illubabor, but a rich ground cover is developed. Lianas, pseudolianas and herbaceous vines are infrequent. Vascular epiphytes seem to be less frequent than in Kaffa and Illubabor, while mosses are very abundant. The bamboo *Arundinaria alpina* occurs in scattered stands.

At the highest altitude at which this forest was



Fig. 7. *Olea welwitschii* in partly cleared forest W of Bonga (Kaffa) at 1900 m.

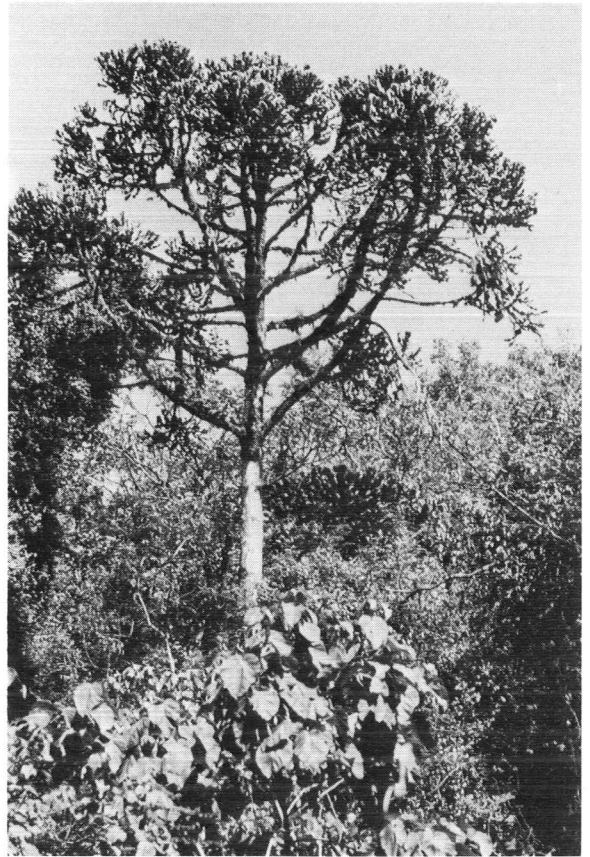


Fig. 8. *Euphorbia obovalifolia* in forest S of Gore (Illubabor) at 1700 m.

studied, c. 2650 m, *Hagenia abyssinica* and *Schefflera abyssinica* were frequent, but a distinct *Hagenia* zone was not developed.

#### Upland dry evergreen forest

This forest type was studied in Menagesha Forest, c. 30 km west of Addis Ababa at 2500–2700 m, and around Neghelle at 1600–1700 m. The composition of these two forests is shown on Tab. 5, and a view of Menagesha Forest is shown in Fig. 10.

The 20–30 m high canopy in Menagesha Forest is formed by *Juniperus procera*, occasionally mixed with *Podocarpus gracilior*. A lower stratum of 8–15 m high trees is very discontinuous and poor in species. A stratum of small trees and shrubs is also poorly developed. Pachycauls are only present along streams or in ravines.

Only three climbing species were recorded. The ground cover was open, but comparatively rich in species. Bamboos were not noticed. Vascular epiphytes were infrequent. Epiphytic mosses were not prominent.

No *Hagenia* zone was developed at the upper edge of the forest.

The forest at Neghelle was much destroyed, and only few *Juniperus procera* trees were left. The forest seemed to have had a discontinuous lower stratum of sclerophyllous species and a sparse and discontinuous



Fig. 9. Horizontal branch with dense cover of *Scadoxus nutans* in forest S of Gore.

Tab. 5. Floristic composition of upland dry evergreen forest.  
 A. Menagesha Forest (Shoa), 2500–2700 m.  
 B. Forest at Neghelle (Sidamo), 1600–1700 m.  
 The ground cover is not recorded in B.

	A	B		A	B
<b>Tall trees (15–35 m)</b>			<b>Epiphytes</b>		
<i>Juniperus procera</i> . . . . .	x	x	<i>Peperomia tetraphylla</i> . . . . .	x	.
<i>Podocarpus gracilior</i> . . . . .	x	.	<i>Sedum epidendrum</i> . . . . .	x	.
			<i>Stolzia repens</i> . . . . .	x	.
<b>Medium sized trees (8–15 m)</b>			<i>Umbilicus botryoides</i> . . . . .	x	.
<i>Allophylus abyssinicus</i> . . . . .	x	.			
<i>Barbeya oleoides</i> . . . . .	x	x	<b>Ground herbs</b>		
<i>Cussonia holstii</i> . . . . .	x	x	<b>Ferns</b>		
<i>Dovyalis abyssinica</i> . . . . .	x	.	<i>Asplenium abyssinicum</i> . . . . .	x	–
<i>Hagenia abyssinica</i> . . . . .	x	.	<i>Cheilanthes farinosa</i> . . . . .	x	–
<i>Olea europaea</i> ssp. <i>africana</i> . . . . .	x	x	<i>Dryopteris inaequalis</i> . . . . .	x	–
<i>Olinia rochetiana</i> . . . . .	x	.	<i>Polystichum setiferum</i> var. <i>fuscopaleaceum</i> . . . . .	x	–
			<i>Pteris cretica</i> . . . . .	x	–
<b>Small trees (less than 8 m)</b>			<i>P. quadriaurita</i> . . . . .	x	–
<i>Acokanthera schimperi</i> . . . . .	.	x	<i>Thelypteris pozoi</i> . . . . .	x	–
<i>Catha edulis</i> . . . . .	.	x			
<i>Euclea schimperi</i> . . . . .	.	x	<b>Seed plants</b>		
<i>Halleria lucida</i> . . . . .	.	x	<i>Agrostis schimperana</i> . . . . .	x	–
<i>Myrsine africana</i> . . . . .	.	x	<i>Cardamine africana</i> . . . . .	x	–
<i>Pistacia lentiscus</i> var. <i>emarginata</i> . . . . .	.	x	<i>Carex johnstonii</i> . . . . .	x	–
			<i>C. bequaertii</i> . . . . .	x	–
<b>Shrubs</b>			<i>Crassula alsinoides</i> . . . . .	x	–
<i>Carissa edulis</i> . . . . .	x	x	<i>Cyperus fischerianus</i> . . . . .	x	–
<i>Discopodium penninervium</i> . . . . .	x	.	<i>Droguetia iners</i> . . . . .	x	–
			<i>Geranium arabicum</i> . . . . .	x	–
<b>Pachycauls</b>			<i>Impatiens hochstetteri</i> . . . . .	x	–
<i>Lobelia giberroa</i> . . . . .	x	.	<i>Kyllinga odorata</i> var. <i>major</i> . . . . .	x	–
<i>Senecio gigas</i> . . . . .	x	.	<i>Pentas schimperana</i> . . . . .	x	–
			<i>Pilea rivularis</i> . . . . .	x	–
<b>Lianas and pseudolianas</b>			<i>Satureja simensis</i> . . . . .	x	–
<i>Rubus aethiopicus</i> . . . . .	x	.	<i>Streblochaete longiaristata</i> . . . . .	x	–
<i>Phytolacca dodecandra</i> . . . . .	x	.	<i>Veronica abyssinica</i> . . . . .	x	–
<i>Urera hypselodendron</i> . . . . .	x	.			

ground cover. No lianas or epiphytes were observed. The forests represent an interesting very dry type of forest, which according to earlier authors, e.g. Cufodontis (1940: 165) has covered considerable areas.

#### Riverine forests

Riverine forests were studied at very different altitudes and on different substrates. The floristic composition of the forests is shown in Tab. 6, and a view of the forest at Baro River is shown in Fig. 11.

The forests consist of a 10–20 m high canopy which is rich in species. *Albizia grandibracteata* is frequent at higher altitudes, while other species, e.g. *Mimusops kummel*, *Syzygium guineense* ssp. *guineense* and *Phoenix reclinata*, are common at most altitudes. The majority of the canopy species are evergreen.

The shrub layer is often dense, and lianas are mostly prominent. The ground cover is usually sparse because of the dense shrub layer. *Salix subserrata* frequently forms thickets on the riverbanks.

Vascular epiphytes are not frequent, and epiphytic mosses almost absent.

The flora of the riverine forests contains three components:

- 1) Species restricted to riverine forest, e.g. *Ficus vallis-choudae*, *Trichilia emetica* and *Salix subserrata*.
- 2) Species also occurring in the upland rain forests, e.g. *Chionanthus mildbraedii*, *Ficus sur* and *Pittosporum amnii* ssp. *ripicola*.
- 3) Species also occurring in lowland rain forest elsewhere in Africa, e.g. *Malacantha alnifolia* and *Whitfieldia elongata*.

#### Comparison with forests of adjacent countries

The similarities of the Ethiopian forests with those of other African countries have never been assessed. It is attempted here to compare the Ethiopian forests with those of the Sudan and East Africa. Material for the comparison is drawn from the literature and from personal observations made by Friis in Kenya in 1975.

The only area in the Sudan with forest comparable to that of Ethiopia is found on the Imatong Mts. and the adjoining hills near the Sudanian border with Uganda

Tab. 6. Floristic composition of riverine forest.  
 A. At Baro River (Illubabor), c. 500 m.  
 B. At Gabba River (Illubabor), 1200–1500 m.  
 C. At Gogeb River (Kaffa), c. 1250 m.  
 D. Bole Valley (Shoa), c. 1650 m.  
 E. At Genale Doria (Sidamo), c. 1100 m.

	A	B	C	D	E
Canopy trees					
<i>Albizia grandibracteata</i> .....		×	×	×	.
<i>Aphania senegalensis</i> .....	×	.	.	.	.
<i>Baphia abyssinica</i> .....	×	.	×	.	.
<i>Ficus glumosa</i> .....	×	.	.	.	.
<i>F. sur</i> .....	.	.	×	.	.
<i>F. sycomorus</i> .....	.	.	.	.	×
<i>F. thonningii</i> .....	.	×	×	×	.
<i>F. vallis-choudae</i> .....	×	.	×	.	.
<i>Garcinia buchananii</i> .....	.	.	×	.	.
<i>Lecaniodiscus fraxinifolius</i> .....	×	.	.	.	.
<i>Malacantha alnifolia</i> .....	.	.	×	.	.
<i>Mimusops kummel</i> .....	×	×	×	×	×
<i>Syzygium guineense</i> ssp. <i>guineense</i> .....	.	×	×	×	.
<i>Tamarindus indica</i> .....	×	.	.	.	×
<i>Trichilia emetica</i> .....	.	.	.	.	×
<i>Turraea nilotica</i> .....	×	.	.	.	.
Shrubs and small trees					
<i>Argomuellera macrophylla</i> .....	×	×	×	.	.
<i>Bridelia micrantha</i> .....	.	.	.	×	.
<i>Diospyros abyssinica</i> .....	.	.	×	.	.
<i>Eugenia bukobensis</i> .....	.	×	.	.	.
<i>Haplocoelum gallaense</i> .....	×	.	.	.	.
<i>Harrisonia abyssinica</i> .....	×	.	.	.	.
<i>Maerua triphylla</i> .....	×	.	.	.	.
<i>Myrica salicifolia</i> .....	.	.	.	×	.
<i>Oncoba spinosa</i> .....	.	.	×	.	.
<i>Rothmannia urcelliformis</i> .....	.	.	.	×	.
<i>Phyllanthus reticulatus</i> .....	.	.	×	.	.
<i>Pitosporum mannii</i> ssp. <i>ripcola</i> .....	.	.	.	×	.
<i>Salix subserata</i> .....	.	.	.	×	.
<i>Sesbania dummerii</i> .....	.	×	.	.	.
<i>Strychnos henningsii</i> .....	×	.	.	.	.
<i>S. mitis</i> .....	×	.	×	.	.
<i>Teclea nobilis</i> .....	×	.	.	.	.
<i>Trichocladus ellipticus</i> .....	.	.	×	.	.
Lianas and pseudolianas					
<i>Artabotrys monteiroae</i> .....	.	.	×	.	.
<i>Cissus populnea</i> .....	×	.	.	.	.
<i>Combretum capituliflorum</i> .....	×	.	.	.	.
<i>Embelia schimperi</i> .....	.	.	.	×	.
<i>Hippocratea africana</i> .....	.	.	×	.	.
<i>H. pallens</i> .....	.	×	.	.	.
<i>Hymenodictyon floribundum</i> .....	.	×	.	.	.
<i>Pisonia aculeata</i> .....	.	×	.	.	.
<i>Salacia congolensis</i> .....	.	×	×	.	.
<i>Phytolacca dodecandra</i> .....	.	.	×	×	.
<i>Uvaria angolensis</i> .....	.	.	×	.	.
Pachycauls					
<i>Phoenix reclinata</i> .....	.	×	×	×	×
Epiphytes					
Ferns					
<i>Asplenium buetneri</i> .....	.	×	.	.	.
Seed plants					
<i>Peperomia tetraphylla</i> .....	.	×	×	×	.
<i>P. rotundifolia</i> .....	.	.	×	.	.
<i>Rhipsalis cassytha</i> .....	.	×	×	.	.
<i>Stolzia repens</i> .....	.	.	×	.	.



Fig. 10. Upland dry evergreen forest in Menagesha Forest (Shoa) at 2500 m. To the left a large specimen of *Juniperus procera*. In the central part of the picture rosettes of *Lobelia gibberoa*.

and Kenya. These forests are only 500 km away from the nearest forests in Ethiopia, but all grow on crystalline rocks. A list of species from the upland rain forest of the Imatong Mts. (Jackson 1956), contains largely the same species as those listed from e.g. Bellela Forest, but some differences are noticeable. *Aningeria adolfi-friedericii* seems to be rare on the Imatong Mts., where it is restricted to mountain slopes below 1800 m, while in Ethiopia it occurs up to c. 2400 m. *Podocarpus milanjanus* is the most important canopy species on the Imatong Mts. above 1800 m, where it is dominant together with *Olea welwitschii* and *Syzygium guineense* ssp. *afromontanum* (= Jackson's 'S. sp. aff. *S. gerrardii*'), but *Podocarpus milanjanus* is entirely absent from Ethiopia, where it is replaced by *P. gracilior*. Some other East African forest trees also reach the Imatong Mts. but are absent in Ethiopia, e.g. *Ochna holstii*, *Grumilea platyphylla*, *Chrysophyllum gorungosanum* (= Jackson's *C. fulvum*) and *Fagara macrophylla*.

Upland dry evergreen forest does not occur on the Imatong Mts. proper, but Jackson reports the presence of *Juniperus procera*-*Olea europaea* ssp. *africana* forest on Mt. Lotuke, about 75 km to the east.

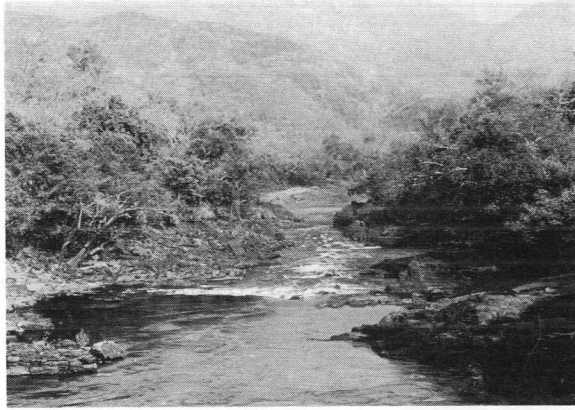


Fig. 11. Riverine forest at Baro River (Illubabor) at 550 m.

Lowland rain forest is well represented on the Imatong Mts. at an altitude of c. 1000 m. Jackson enumerates more than 70 species of trees taller than 10 m from these forests.

The upland rain forests of Uganda are richer in species than those of SW Ethiopia. Langdale-Brown & al. (1964) record that *Chrysophyllum gorungosanum*, *Podocarpus milanjanus* and *Entandophragma excelsum* are frequent co-dominants in *Aningeria adolfi-friedericii* forests. Dale (1940) describes an upland rain forest at 2000 m on the S slope of Mt. Elgon in which *Aningeria adolfi-friedericii* (= Dale's *Malacantha* sp.) is associated with *Entandophragma excelsum* (= Dale's *Entandophragma* sp.), *Neoboutonia macrocalyx*, *Alangium chinense*, *Casearia batiscombei*, *Strombosia scheffleri* (= Dale's *S. grandifolia*), *Fagara macrophylla*, *Trilepisium madagascariense* (= Dale's *Bosqueia phoberos*) and *Podocarpus milanjanus*, all species which are absent from or rare in the upland rain forest of Ethiopia.

The dry northern side of Mt. Elgon and the string of dry mountains of Karamoja are floristically poor. Langdale-Brown & al. (1964) report from these localities a *Juniperus procera*-*Podocarpus gracilior* forest similar to that known from Ethiopia.

Friis visited a *Juniperus procera*-*Podocarpus gracilior* forest on the Kenyan side of Mt. Elgon at altitudes between 2200 and 3000 m. Two important species in this forest, *Xymalos monospora* and *Afrocrania volkensii*, do not reach Ethiopia although they are widespread in eastern Africa as far south as Zimbabwe and the South African Republic.

The humid western face of the Cherangani Hills is covered with a forest of *Podocarpus milanjanus* up to c. 2700 m, where *Juniperus procera* becomes the dominant species (Mabberley 1975; own observations).

The forests of the Aberdare Mts. and Mt. Kenya are not well described in the literature, but it is clear that *Ocotea usambarensis* is an important species in the wetter forests of these mountains (White 1970). *O. usambarensis* is unknown from Ethiopia.

The upland evergreen or semi-deciduous forest of Kenya east of the Rift Valley is known e.g. from the Karura Forest near Nairobi. Karura Forest contains a number of species which are absent or very rare in Ethiopia, e.g. *Brachylaena huillensis*, *Croton megalocarpus*, *Calodendron capense*, *Rawsonia lucida*, *Suregada procera* and *Chaetachme aristata*. However, a number of other species occur in the dry upland forests of both countries, e.g. *Acokanthera schimperi*, *Schrebera alata*, *Olea europaea* ssp. *africana*, and *Euclea divinorum* (Lind & Morrison 1974; own observations).

A very dry *Juniperus procera* forest was studied by Friis on the Chyulu Mts. at 1700 m. The principal species were *Juniperus procera*, *Catha edulis*, *Pistacia lentiscus* var. *emarginata*, *Nuxia congesta* and *Rhus* sp. The forest was very similar to the dry *Juniperus procera* forests of southern Ethiopia.

The forest of Kakamega in western Kenya is situated at about 1450 m, the same altitude as some of the forest areas studied by us between Gore and Yaiyo. Kakamega Forest is unique in Kenya, being the only forest of the West African-Congo type (Lucas 1968) in that country. The preliminary list of woody species published by Lucas shows that a number of species are in common with the upland forests of SW Ethiopia, others are members of the riverine forests. However, the fact that Lucas lists 10 emergent tree species and a total of 132 species of woody plants from Kakamega Forest clearly indicates that this forest has a much more complex physiognomy and is floristically much richer than the forests of SW Ethiopia, where the comparable figures for e.g. the forests at Gore, are one emergent tree species and c. 50 species of woody plants.

It can be concluded that the upland rain forest of Ethiopia is closely related physiognomically and floristically to the upland rain forests of Uganda and western Kenya, although it is floristically poorer.

The Ethiopian forests at higher altitudes are very similar to the *Juniperus procera*-*Podocarpus gracilior* forests of East Africa, but also here the canopy of the Ethiopian forests is floristically poorer than that of the East African forests. The similarity of the very dry *Juniperus procera* forests at lower altitudes in southern Ethiopia and Kenya seems to be great.

### Bushlands

Bushland is a very widespread formation in Ethiopia, both in the arid lowlands and at higher altitudes. All vegetation in which shrubs form the main component is classified here. Two main formation types are readily distinguishable: evergreen bushland and deciduous bushland. Greenway (1973) further distinguishes between coastal evergreen bushland and upland evergreen bushland, of which only the latter is known from Ethiopia.

Tab. 7. Floristic composition of upland evergreen bushland.  
 A. Above Menagesha Forest (Shoa), 3200–3300 m.  
 B. On slopes of Bole Valley (Shoa), 1700–1850 m.  
 C. North east of Neghelle (Sidamo), 1600–1700 m.  
 D. West facing slope of Mt. Maigudo (Kaffa), c. 2700 m.  
 E. West and south of Jimma (Kaffa), 1700–1800 m.

	A	B	C	D	E
<b>Shrubs or stunted trees</b>					
<i>Acanthus arboreus</i> . . . . .				x	x
<i>A. sennii</i> . . . . .				x	.
<i>Acokanthera schimperi</i> . . . . .	x	x			
<i>Adhatoda schimperana</i> . . . . .			x	x	x
<i>Agauria salicifolia</i> . . . . .			x		
<i>Buddleja polystachya</i> . . . . .	x		x		
<i>Calpurnia aurea</i> . . . . .			x	x	x
<i>Carissa edulis</i> . . . . .			x	x	x
<i>Cassia floribunda</i> . . . . .				x	
<i>Clerodendrum myricoides</i> . . . . .			x	x	x
<i>Clutia abyssinica</i> . . . . .			x		
<i>Cordia abyssinica</i> . . . . .				x	
<i>Discopodium penninervium</i> . . . . .			x		
<i>Dodonaea viscosa</i> . . . . .	x	x	x	x	x
<i>Erica arborea</i> . . . . .	x		x		
<i>Euclea schimperi</i> . . . . .		x	x		
<i>Gardenia ternifolia</i> . . . . .				x	
<i>Grewia ferruginea</i> . . . . .			x	x	
<i>Guizotia arborescens</i> . . . . .			x		
<i>Heteromorpha trifoliata</i> . . . . .	x	x		x	
<i>Hypericum quartinianum</i> . . . . .			x	x	
<i>Jasminum stans</i> . . . . .	x				
<i>Maesa lanceolata</i> . . . . .	x		x	x	
<i>Maytenus obscurus</i> . . . . .	x				
<i>Myrica salicifolia</i> . . . . .	x		x		
<i>Myrsine africana</i> . . . . .	x		x	x	
<i>Nuxia congesta</i> . . . . .			x	x	
<i>Olea europaea ssp. africana</i> . . . . .	x	x			
<i>Osyris lanceolata</i> . . . . .	x				
<i>Pittosporum feddeanum</i> . . . . .		x			
<i>P. mannii ssp. ripicola</i> . . . . .			x	x	
<i>Protea gagedi</i> . . . . .	x		x		
<i>Rapanea melanophloeos</i> . . . . .			x		
<i>Rhamnus prinoides</i> . . . . .			x	x	
<i>R. staddo</i> . . . . .				x	
<i>Rhus glutinosa</i> . . . . .	x				
<i>R. retinorrhoea</i> . . . . .	x				
<i>R. vulgaris</i> . . . . .		x			
<i>Rosa abyssinica</i> . . . . .	x				
<i>Ruttya fruticosa</i> . . . . .		x			
<i>Tarchonanthus camphoratus</i> . . . . .		x			
<i>Tinnea somalensis</i> . . . . .		x			
<i>Zanthoxylon usambarense</i> . . . . .		x			
<b>Lianas</b>					
<i>Gouania longispicata</i> . . . . .				x	
<i>Helinus mystacinus</i> . . . . .				x	
<i>Jasminum abyssinicum</i> . . . . .				x	
<i>J. eminii</i> . . . . .				x	
<i>Periploca linearifolia</i> . . . . .			x		
<i>Taccazzea galactogoga</i> . . . . .			x	x	
<b>Herbaceous vines</b>					
<i>Cissus adocephala</i> . . . . .				x	
<i>Dioscorea quartiniana</i> . . . . .				x	
<i>Ipomoea cairica</i> . . . . .				x	
<i>Stephania abyssinica</i> . . . . .				x	

**Upland evergreen bushland**

Upland evergreen bushland was studied above Menagesha Forest, on the slopes of Bole Valley, NE of Neghelle, on the W facing slope of Mt. Maigudo and around Jimma. The floristic composition of the vegetation of these localities is shown in Tab. 7.

There are at least two rather different types of bushland in the sample, one found on Mt. Maigudo and at Jimma, the other found in the remaining three localities. These two types are associated with upland rain forest and upland dry evergreen forest respectively, but the species composition is influenced by the altitude. It seems that in Ethiopia upland evergreen bushland is the natural vegetation on rocky slopes and other well drained sites, or near the climatic limits of forest growth.

Most often, however, upland evergreen bushland represents a grazing-cultivation complex following destruction of the forest, in the regrowth of which it seems to form a seral stage.

The bushland at the upper limit of Menagesha Forest is of the dry type. It occurs on gently sloping ground above the upper limit of the *Juniperus procera* forest.

It probably represents a derived vegetation following destruction of the forest, although it also contained some species which are dominant in the bushland above the natural forest limit, e.g. *Erica arborea*, *Rosa abyssinica* and *Jasminum stans*. Other species were stunted trees from the lower strata in the *Juniperus procera* forest, e.g. *Olea europaea ssp. africana*.

The ground cover is dominated by grasses, most species of which are mentioned below under heading Upland grasslands.

The open bushland on the slopes of the Bole Valley also belongs to the dry type. Considering the steepness of the slope it could well represent a natural type of upland evergreen bushland. Many species in the shrub layer are sclerophyllous, e.g. *Acokanthera schimperi*, *Euclea schimperi* and *Rhus retinorrhoea*, and it has

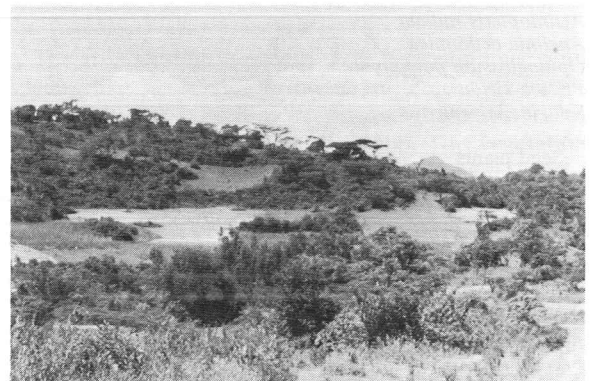


Fig. 12. Farmland mixed with patches of upland evergreen bushland near Beletta Forest (Kaffa) at 2000 m. In the background *Acacia abyssinica* woodland.

Tab. 8. Floristic composition of deciduous bushland, 'Acacia-Commiphora bushland'.  
 A. South of Waddere and towards Genale Doria (Sidamo), 1100–1600 m.  
 B. Between Neghelle and Filtu (Sidamo), 1300–1600 m.

	A	B		A	B
<b>Trees</b>					
<i>Acacia brevispica</i> . . . . .		×	<i>B. serrata</i> var. <i>gossypina</i> . . . . .	×	.
<i>A. mellifera</i> . . . . .		×	<i>Cenchrus ciliaris</i> . . . . .		×
<i>A. senegal</i> . . . . .		×	<i>Ceropegia abyssinica</i> . . . . .	×	×
<i>Combretum aculeatum</i> . . . . .	×	.	<i>Chloris mensense</i> . . . . .	×	×
<i>C. collinum</i> ssp. <i>binderanum</i> . . . . .	×	.	<i>C. roxburghiana</i> . . . . .		×
<i>C. molle</i> . . . . .	×	×	<i>Chlorophytum humifusum</i> . . . . .	×	.
<i>Delonix elata</i> . . . . .		×	<i>C. neghellense</i> . . . . .	×	.
<i>Sterculia rhyncocarpa</i> . . . . .	×	.	<i>C. tordense</i> . . . . .		×
<i>Terminalia brownii</i> . . . . .		×	<i>Chrysopogon aucheri</i> var. <i>quinqueplumis</i> . . . . .		×
<b>Shrubs</b>					
<i>Acacia drepanolobium</i> . . . . .		×	<i>Coleus barbatus</i> . . . . .	×	×
<i>Boswellia neglecta</i> . . . . .		×	<i>Commelina stefaniniana</i> . . . . .		×
<i>Cassia baccarinii</i> . . . . .		×	<i>Craterostigma plantagineum</i> . . . . .	×	×
<i>Colutea abyssinica</i> . . . . .	×	.	<i>C. pumilum</i> . . . . .	×	×
<i>Commiphora</i> cf. <i>africana</i> . . . . .		×	<i>Cyperus bulbosus</i> var. <i>spicatus</i> . . . . .		×
<i>C.</i> cf. <i>baluensis</i> . . . . .		×	<i>C. rubicundus</i> . . . . .		×
<i>Dodonaea viscosa</i> . . . . .	×	×	<i>Cyphia glandulifera</i> . . . . .	×	.
<i>Euphorbia jatrophioides</i> . . . . .		×	<i>Cypholepis yemenica</i> . . . . .		×
<i>Grewia villosa</i> . . . . .		×	<i>Dactyloctenium scindicum</i> . . . . .		×
<i>Kirkia</i> cf. <i>tenuifolia</i> . . . . .		×	<i>Digitaria pinnata</i> . . . . .		×
<i>Lycium europaeum</i> . . . . .	×	×	<i>D. rivae</i> . . . . .		×
<i>Ochna inermis</i> . . . . .	×	.	<i>Dioscorea gillettii</i> . . . . .		×
<i>Parkinsonia scioana</i> . . . . .		×	<i>Dorstenia barnimiana</i> . . . . .	×	×
<i>Rhus vulgaris</i> . . . . .	×	.	<i>D. ellenbeckiana</i> . . . . .		×
<i>Sesamothamnus rivae</i> . . . . .	×	.	<i>D. foetida</i> . . . . .		×
<b>Climbers</b>					
<i>Adenia</i> sp. . . . .		×	<i>Echinochilon lithospermoides</i> . . . . .		×
<i>Capparis sepialis</i> var. <i>rivae</i> . . . . .	×	.	<i>Eleusine intermedia</i> . . . . .	×	.
<i>Cassytha filiformis</i> . . . . .		×	<i>Endostemon tereticaulis</i> . . . . .		×
<i>Cephalopentandra ecirrhosa</i> . . . . .	×	.	<i>E. tenuiflorus</i> . . . . .		×
<i>Ceropegia affinis</i> . . . . .	×	.	<i>Enneapogon schimperanus</i> . . . . .		×
<i>Cladostigma dioicum</i> . . . . .		×	<i>Eragrostis papposa</i> . . . . .		×
<i>Corallocarpus schimperii</i> . . . . .	×	.	<i>Erlangea cordifolia</i> . . . . .	×	.
<i>Cucumella engleri</i> . . . . .	×	×	<i>Erythrochlamys cufodontii</i> . . . . .		×
<i>Cucumis prophetarum</i> ssp. <i>dissectus</i> . . . . .	×	×	<i>Eustachya paspaloides</i> . . . . .		×
<i>Cynanchum falcatum</i> . . . . .		×	<i>Euphorbia acalyphoides</i> . . . . .	×	×
<i>C. hastifolium</i> . . . . .		×	<i>E. glochidiata</i> . . . . .		×
<i>Ipomoea obscura</i> . . . . .		×	<i>E. gorinii</i> . . . . .		×
<i>Paederia pospischilii</i> . . . . .		×	<i>E. polyantha</i> . . . . .		×
<i>Trochomeria macrocarpa</i> . . . . .	×	.	<i>Farsetia ramosissima</i> . . . . .		×
<i>Vatovaea pseudolablab</i> . . . . .	×	.	<i>Felicia hyssopifolia</i> . . . . .		×
<b>Ground herbs</b>					
<b>Ferns and fern allies</b>					
<i>Actiniopteris radiata</i> . . . . .	×	.	<i>Fimbristylis ovata</i> . . . . .	×	.
<i>Anemia aethiopica</i> . . . . .	×	.	<i>Fuerstia africana</i> . . . . .	×	.
<i>Ophioglossum polyphyllum</i> . . . . .	×	.	<i>Gomphocarpus fruticosus</i> . . . . .		×
<i>Pellaea viridis</i> . . . . .	×	.	<i>Harmsia sidoides</i> . . . . .		×
<i>Selaginella yemensis</i> . . . . .		×	<i>Harpachne</i> sp. . . . .	×	.
<b>Seed plants</b>					
<i>Acalypha volkensii</i> . . . . .	×	.	<i>Heliotropium longiflorum</i> . . . . .		×
<i>Albuca blepharophylla</i> . . . . .		×	<i>H. simile</i> . . . . .		×
<i>Andropogon dummeri</i> . . . . .	×	.	<i>H. steudneri</i> . . . . .		×
<i>A. schinzii</i> . . . . .	×	.	<i>Heteropogon contortus</i> . . . . .		×
<i>Aneilema gillettii</i> . . . . .	×	.	<i>Hibiscus calophyllus</i> . . . . .		×
<i>Anthericum zavattarii</i> . . . . .		×	<i>H. crassinervius</i> . . . . .	×	.
<i>Aristida adscencionis</i> . . . . .	×	×	<i>Hildebrandtia africana</i> . . . . .		×
<i>Athroisma boranensis</i> . . . . .	×	.	<i>Hypoxis angustifolia</i> . . . . .	×	.
<i>Becium ellenbeckii</i> . . . . .		×	<i>Indigofera brevicealyx</i> . . . . .		×
<i>B. obovatum</i> . . . . .		×	<i>I. schimperii</i> . . . . .		×
<i>Bidens hildebrandtii</i> var. <i>boranensis</i> . . . . .		×	<i>I. stipulosa</i> . . . . .		×
<i>Blepharispermum fruticosum</i> . . . . .		×	<i>Jatropha hildebrandtii</i> . . . . .		×
<i>Brachiaria lachnantha</i> . . . . .	×	.	<i>Justicia flava</i> . . . . .	×	×
			<i>J. odora</i> . . . . .		×
			<i>Leptochloa rupestris</i> . . . . .		×
			<i>Leptothrium senegalensis</i> . . . . .		×
			<i>Loudetia flavida</i> . . . . .		×
			<i>Melhanina steudneri</i> . . . . .		×
			<i>M. velutina</i> . . . . .		×
			<i>Microchloa indica</i> . . . . .		×
			<i>M. kunthii</i> . . . . .		×
			<i>Monadenium majus</i> . . . . .		×



	A	B
<i>Monsonia angustifolia</i> .....	×	×
<i>Nidorella zavattarii</i> .....	×	.
<i>Notonia abyssinica</i> .....	×	.
<i>Ocimum spicatum</i> .....	×	×
<i>Ornithogalum donaldsonii</i> .....	×	×
<i>O. longibracteatum</i> .....	×	.
<i>Orthosiphon oblongifolium</i> .....	×	×
<i>Osteospermum vaillantii</i> .....	×	×
<i>Osyris lanceolata</i> .....	×	×
<i>Panicum deustum</i> .....	×	×
<i>P. hochstetteri</i> .....	×	×
<i>P. maximum</i> .....	×	×
<i>P. poaeoides</i> .....	×	×
<i>P. ruspolii</i> .....	×	.
<i>Pavonia hildebrandtii</i> .....	×	×
<i>P. patens</i> .....	×	×
<i>Pelargonium boranense</i> .....	×	×
<i>P. glechomoides</i> .....	×	×
<i>Pentanicia ouratogyne</i> .....	×	×
<i>Phyllanthus maderaspatensis</i> .....	×	×
<i>P. odontadenus</i> .....	×	.
<i>P. rotundifolius</i> .....	×	×
<i>Plectranthus cylindraceus</i> .....	×	×
<i>Polygala abyssinica</i> .....	×	×
<i>P. quartiniana</i> .....	×	.
<i>Rhyncelytrum repens</i> .....	×	×
<i>Satanocrater paradoxa</i> .....	×	×
<i>S. somalensis</i> .....	×	×
<i>Satureja abyssinica</i> .....	×	×
<i>Scilla</i> cf. <i>kirkii</i> .....	×	X
<i>Setaria sphacelata</i> .....	×	.
<i>S. trinervia</i> .....	×	×
<i>Sporobolus africanus</i> .....	×	×
<i>S. festivus</i> .....	×	×
<i>S. pellucidus</i> .....	×	×
<i>Talinum portulacifolium</i> .....	×	.
<i>Tetrapogon cenchriformis</i> .....	×	×
<i>T. villosus</i> .....	×	×
<i>Themeda triandra</i> .....	×	×
<i>Trachyandra saltii</i> .....	×	×
<i>Trachyandra</i> sp. nov.? .....	×	×
<i>Tripogon curvatus</i> .....	×	×
<i>Triraphis</i> sp. ....	×	×
<i>Triumfetta flavescens</i> .....	×	×
<i>Volutaria lippii</i> .....	×	×
Xerophyta <i>schnizleinia</i> .....	×	×
<i>Zornia apiculata</i> .....	×	×
<i>Z. setosa</i> ssp. <i>obovata</i> .....	×	.

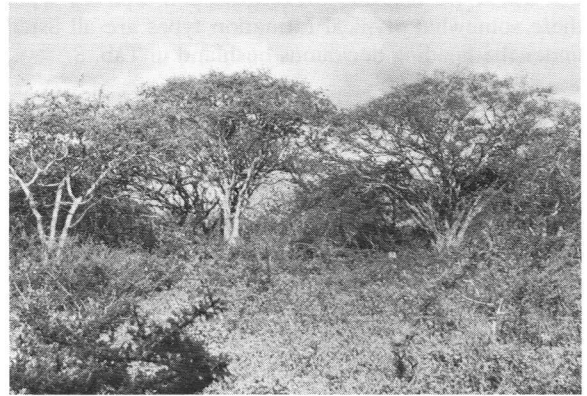


Fig. 13. Tall deciduous bushland 70 km E of Neghelle (Sidamo) at 1300 m.

ble to the *Hagenia-Schefflera* association mentioned above from the upland rain forests of Sidamo.

The evergreen bushland at Jimma was observed to invade abandoned farmland and pasture land (secondary upland grassland). A number of species were in common with the lower strata in the upland rain forest, e.g. *Pitopsis mannii* ssp. *ripicola*, others were forest pioneer species, e.g. *Maesa lanceolata* and *Clausena anisata*, some were associated with forest margins, e.g. *Cordia abyssinica* and *Calpurnia aurea*, and some typical evergreen bushland species, e.g. *Carissa edulis* and *Rhamnus staddo*.

Uppgrowth of *Acacia abyssinica* was frequently observed, which indicates that *Acacia abyssinica* woodland (see below) is the next seral stage in the regrowth of the forest.

#### Deciduous bushland

Deciduous bushland was studied between Waddere and Genale Doria, around Neghelle and towards Filtu. The floristic composition is shown in Tab. 8, and a view of the vegetation near Filtu in Fig. 13.

The tree stratum is mostly very discontinuous, with species like *Terminalia brownii* scattered over an almost continuous stratum of shrubs where species of *Acacia* and *Commiphora* are common. This vegetation is therefore often termed *Acacia-Commiphora* bushland.

The ground cover is mostly discontinuous, with many annual grasses and bulbous plants. A very characteristic feature of the ground cover is the richness in subshrubs, "forbs", e.g. *Harmsia sidoides*, *Melhaniea steudneri*, *M. velutina*, *Endostemon tereticaule*, etc. (marked as such in Tab. 8). Succulents were not prominent.

In some places scattered trees occurred in the bush (Greenway's dry scrub with trees), in other cases depressions were covered with grassland interspersed with

some resemblance to the bushland at Neghelle. At both Bole Valley and Neghelle the ground cover is discontinuous and rich in grasses.

The upland evergreen bushland on Mt. Maigudo and at Jimma form a mosaic with fields and wooded grassland or woodland, all evidently seral stages in the regrowth following shifting cultivation (Fig. 12). In neither of these localities did upland evergreen bushland seem to be the natural vegetation.

On Mt. Maigudo patches of bushland with *Rapanea* alternated with *Hagenia abyssinica* woodland, which seemed to indicate that the natural vegetation would be *Hagenia-Rapanea* forest, an association which in East Africa may represent the upper zone of the upland rain forest (Lind & Morrison 1974), and which is compara-

the dwarf tree *Acacia drepanolobium*. Species from these somewhat atypical formation types are all listed under the heading deciduous bushland in Tab. 8.

### Woodlands

All open stands of trees with crowns covering at least one fifth of the ground are classified as woodland (Greenway 1973). A shrub layer may be present or not, and the ground cover can be continuous or discontinuous. Several types of woodland are found in Ethiopia, but we only studied two types: semi-evergreen woodland with *Acacia abyssinica* as the only dominant tree, and the simple-leaved deciduous woodland, which has a richer flora of woody species and in which species of *Combretum* are often dominant.

### *Acacia abyssinica* woodland

This type of woodland was studied at many places both in Kaffa and Illubabor. It followed abandoned cultivation or invaded pasture land, and was also observed to form a fringe around patches of upland rain forest. A stratum of shrubs is mostly developed under the *Acacia* trees, the crowns of which form an almost continuous canopy. This stratum of shrubs is floristically closely related to the upland evergreen bushland described above from Kaffa, and a list of species is therefore not given. Epiphytes are rare, the most common being the parasitic *Loranthus woodfordioides*.

It seems certain that in Ethiopia the *Acacia abyssinica* woodlands forms a seral stage in the regeneration of the upland rain forest. This has also been suggested for the Imatong Mts. in Sudan by Jackson (1956: 363). The relation between *Acacia abyssinica* woodland and drier Ethiopian forest is not known, but Pichi-Sermolli (1957 a: 80) describes, from the area around Lake Tana, a type of *Acacia abyssinica* woodland with a dense under-

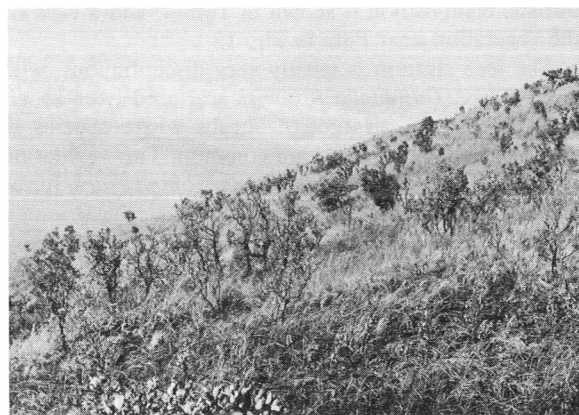


Fig. 14. Deciduous woodland and grassland on slope near Gogeb River (Kaffa) at 1400 m.

Tab. 9. Floristic composition of deciduous woodland.

A. West of Bure (Illubabor), 500–1400 m.

B. On slopes of Gogeb Valley (Kaffa), 1200–1300 m.

C. On west facing slope of Mt. Maigudo (Kaffa), c. 2100 m.

	A	B	C
<b>Trees</b>			
<i>Albizia malacophylla</i> .....	×	.	.
<i>Combretum collinum</i> ssp. <i>hypopilinum</i> .....	×	.	.
<i>C. fragrans</i> .....	×	.	.
<i>C. molle</i> .....	.	×	×
<i>Cussonia arborea</i> .....	.	×	.
<i>C. ostinii</i> .....	.	.	×
<i>Dombeya quinqueseta</i> .....	.	×	×
<i>Lannea schimperi</i> .....	×	.	.
<i>Lonchocarpus laxiflorus</i> .....	×	.	.
<i>Piliostigma thonningii</i> .....	×	×	.
<i>Protea gaguedi</i> .....	.	.	×
<i>P. madiensis</i> .....	.	×	.
<i>Sterculia africana</i> .....	×	.	.
<i>Stereospermum kunthianum</i> .....	×	×	×
<i>Tamarindus indica</i> .....	×	.	.
<i>Terminalia glaucescens</i> .....	.	×	.
<i>Ximenia americana</i> .....	×	.	.
<b>Shrubs</b>			
<i>Grewia mollis</i> .....	×	.	.
<i>Maytenus senegalensis</i> .....	×	×	.
<i>Maeria oblongifolia</i> .....	×	.	.
<b>Climbers</b>			
<i>Opilia celtidifolia</i> .....	×	.	.
<b>Epiphytes</b>			
<i>Polystachya steudneri</i> .....	.	×	.
<b>Ground herbs</b>			
<i>Urginea altissima</i> .....	×	×	.
<i>Sansevieria nilotica</i> .....	×	.	.

The ground cover was burnt or very dry in all three localities. Only the above mentioned species were identifiable.

growth of shrubs, very much like the one mentioned above from Kaffa. From Harar, Gillett (1941: 67) describes a *Juniperus procera*-*Podocarpus gracilior* forest in which *Acacia abyssinica* is present. It seems very likely that *Acacia abyssinica* woodland also plays an important part in the regrowth of *Juniperus-Podocarpus* forest.

### Deciduous woodland

The deciduous woodlands cover large areas on the western escarpment between 500 and 1400 m on crystalline rock. Localities with this vegetation were only visited during the dry season, and it was therefore only possible to identify a limited number of woody plants and very few of the species in the ground cover. Other localities with deciduous woodland were studied in the deep river valleys, particularly Gogeb Valley (Fig. 14), and on some rocky slopes with unimpeded drainage on the SW Plateau. The floristic composition of these habitats are given in Tab. 9.

Tab. 10. Floristic composition of upland grassland.

A. On Entoto Hill (Shoa), c. 2700 m.

B. At Ankober (Shoa), c. 2700 m.

C. At Jimma (Kaffa), c. 1700 m.

	A	B	C		A	B	C
<b>Ferns</b>							
<i>Dryopteris athamantica</i>	.	.	×	<i>F. simensis</i>	×	×	.
<i>D. inaequalis</i>	×	×	.	<i>Galium simense</i>	×	.	.
<i>Thelypteris bergiana</i>	×	.	.	<i>G. thunbergianum</i>	.	×	.
<i>T. gueinziana</i>	.	.	×	<i>Gnidia stenophylla</i>	.	.	×
<b>Seed plants</b>							
<i>Agrostis lachnantha</i>	×	.	.	<i>Haplocarpha schimperii</i>	×	×	.
<i>A. schimperana</i>	×	.	.	<i>Helichrysum foetidum</i>	×	.	.
<i>Aira caryophyllea</i>	.	×	.	<i>Heracleum abyssinicum</i>	.	×	.
<i>Ajuga remota</i>	.	×	.	<i>Holothrix arachnoidea</i>	.	×	.
<i>Aloe cf. steudneri</i>	.	×	.	<i>H. unifolia</i>	×	.	.
<i>Alysicarpus rugosus</i> ssp. <i>perennirufus</i>	.	×	.	<i>Hyparrhenia arrhenobasis</i>	×	.	.
<i>Andropogon abyssinicus</i>	×	.	.	<i>H. cymbaria</i>	.	.	×
<i>A. distachyus</i>	×	.	.	<i>H. pilgerana</i>	.	.	×
<i>Anthemis tigrensensis</i>	.	×	.	<i>H. rufa</i>	.	.	×
<i>Arabis alpina</i>	.	×	.	<i>Indigofera arrecta</i>	.	.	×
<i>Argyrolobium ramosissimum</i>	×	.	.	<i>Inula decipiens</i>	.	.	×
<i>Aristida adoensis</i>	.	.	×	<i>Juncus oxycarpus</i>	×	.	.
<i>Bartsia petitiiana</i>	.	×	.	<i>Lactuca capensis</i>	×	.	.
<i>Berkheya spekeana</i>	.	×	.	<i>L. paradoxa</i>	.	.	×
<i>Brachiaria brizantha</i>	.	.	×	<i>Lasiocorys stachydiformis</i>	×	.	.
<i>B. jubata</i>	.	.	×	<i>Linum volkensii</i>	×	.	.
<i>Bromus leptoclados</i>	×	.	.	<i>Lotus goetzei</i>	.	×	.
<i>Carduus leptacanthus</i>	×	.	.	<i>Melinis tenuinervis</i>	.	.	×
<i>Carex erythrorhiza</i>	×	.	.	<i>Minuartia filifolia</i>	.	×	.
<i>Cerastium octandrum</i>	×	.	.	<i>Nepeta azurea</i>	.	×	.
<i>Cineraria abyssinica</i>	.	×	.	<i>Odontelytrum abyssinicum</i>	×	.	.
<i>Coleus lanuginosus</i>	×	×	.	<i>Pennisetum giganteum</i>	.	.	×
<i>Conyza hochstetteri</i>	.	×	.	<i>P. glabrum</i>	.	.	×
<i>C. tigrensensis</i>	×	.	.	<i>P. schimperii</i>	×	.	×
<i>Coreopsis macrantha</i>	.	×	.	<i>P. trachyphyllum</i>	.	.	×
<i>Cotula cryptocephala</i>	.	×	.	<i>Pentaschistis imatongensis</i>	×	×	.
<i>Crassocephalum macropappus</i>	×	.	.	<i>Phagnalon hypoleucum</i>	×	×	.
<i>Crassula alba</i>	.	×	.	<i>Plectrocephalus varians</i>	×	×	.
<i>Crepis oliveranus</i>	.	×	.	<i>Polygala steudneri</i>	.	×	.
<i>Cyanotis polyrhiza</i>	×	.	.	<i>Salvia nilotica</i>	×	.	.
<i>Cyperus cimicinus</i>	×	.	.	<i>S. schimperii</i>	.	×	.
<i>Delphinium welbyi</i>	×	.	.	<i>Satureja biflora</i>	×	×	.
<i>Digitaria abyssinica</i>	.	.	×	<i>S. pseudosimensis</i>	.	×	.
<i>Diplolophium africanum</i>	.	.	×	<i>S. simensis</i>	×	.	.
<i>Dipsacus pinnatifidus</i>	.	.	×	<i>Schimperella verrucosa</i>	×	.	.
<i>Echinops amplexicaulis</i>	.	.	×	<i>Sebaea brachyphylla</i>	×	.	.
<i>E. hispidus</i>	.	.	×	<i>Silene burchellii</i>	.	.	×
<i>E. macrochaetus</i>	×	.	.	<i>Snowdenia polystachya</i>	.	.	×
<i>Epilobium stereophyllum</i>	×	.	.	<i>Sporobolus africanus</i>	.	.	×
<i>Eragrostis schweinfurthii</i>	×	.	.	<i>S. natalensis</i>	.	.	×
<i>Ehrharta erecta</i> var. <i>abyssinica</i>	×	×	.	<i>Stachys aculeolata</i>	.	×	.
<i>Eulalia villosa</i>	.	.	×	<i>Tolpis altissima</i>	×	.	.
<i>Exothea abyssinica</i>	.	.	×	<i>Trifolium acaule</i>	×	.	.
<i>Festuca abyssinica</i>	×	.	.	<i>T. calocephalum</i>	×	.	.
				<i>T. semipilosum</i>	×	.	.
				<i>Vermifrux abyssinica</i>	×	×	.

The deciduous woodland on the western escarpment is richer in species than it would appear from the Table. The crowns form a discontinuous canopy, and a very discontinuous shrub layer is present.

The deciduous woodlands in the river valleys and on the plateau are more open and poorer in species than those on the western escarpment.

### Grasslands

Grassland is defined by Greenway (1973) as a vegetation consisting of grasses and other herbs, with trees or shrubs covering not more than one tenth of the ground. Upland grassland was studied on Entoto Hill, at Ankober and at Jimma. A special type of grassland with water oozing through the sward was studied at Kochi

Tab. 11. Floristic composition of upland grassland with oozing water, 'seepage meadow', at Kochi (Kaffa), c. 1700 m.

Ferns	<i>C. flavescens</i>	<i>Hyparrhenia pilgerana</i>	<i>Paspalum scrobiculatum</i>
<i>Thelypteris confluens</i>	<i>C. haspan</i>	<i>H. rufa</i>	var. <i>commersonii</i>
Seed plants	<i>C. nudicaulis</i>	<i>Ilysanthes rotundifolia</i>	<i>Pennisetum glabrum</i>
<i>Acroceras macrum</i>	<i>C. pauper</i>	<i>Leersia hexandra</i>	<i>Phyllanthus boemii</i>
<i>Anagallis tenuicaulis</i>	<i>Dissotis canescens</i>	<i>Lindernia oliverana</i>	<i>Polygonum salicifolium</i>
<i>Andropogon canaliculatum</i>	<i>D. senegambiensis</i>	<i>L. whytei</i>	<i>Pycurus nitidus</i>
<i>Ascolepis capensis</i>	<i>Echinochloa stagnina</i>	<i>Lipocarpa chinensis</i>	<i>Rotala stagnina</i>
<i>Brachiaria jubata</i>	<i>Eleocharis acutangula</i>	<i>Lobelia welwitschii</i>	<i>Sacciolepis africanus</i>
<i>Buchnera capitata</i>	<i>Emilia integrifolia</i>	<i>Ludwigia leptocarpa</i>	<i>Scirpus brachyseras</i>
<i>Coelorhachis afraurita</i>	<i>Eriocaulon dembianense</i>	<i>L. stolonifera</i>	<i>Scleria nutans</i>
<i>Commelina subulata</i>	<i>E. sp. nov. ?</i>	<i>Neophytis paniculata</i>	<i>Typha latifolia</i>
<i>Crassocephalum picridifolium</i>	<i>Fimbristylis dichotoma</i>	<i>Ottelia ulvifolia</i>	<i>Utricularia inflexa</i>
<i>Cyperus dichrostachyus</i>	<i>Floscopa glomerata</i>	<i>Panicum hymenochilum</i>	<i>U. prehensilis</i>
<i>C. dives</i>	<i>Fuirena stricta</i>	<i>P. subalbidum</i>	<i>Xyris capensis</i>
	<i>Hygrophila pobeguinii</i>		

near Jimma. None of the terms suggested by Greenway seem absolutely appropriate for this vegetation, as it is neither 'seasonal swamp grassland' nor 'grass swamp'. The first type is characterized by stagnant water and black-cotton soil, the latter by the presence of large aquatic grasses. The grassland at Kochi has therefore here been termed 'seepage grassland' on account of the oozing water.

#### Upland grassland

The upland grassland on Entoto Hill and at Ankober is characterized by the presence of scattered shrubs such as *Maytenus* sp. and *Erica arborea*. Scattered trees, e.g. *Acacia negrii*, are also present. The ground cover is continuous. Grasses and low herbs are the major components of the sward. Larger herbs, e.g. species of *Aloe* and large specimens of *Echinops*, form a discontinuous intermediate stratum.

This vegetation undoubtedly represents a degraded upland evergreen bushland. The floristic similarity with the ground cover in upland evergreen bushland is very strong, and the presence of many small specimens of *Erica arborea* indicated that *Erica arborea* scrub would be the next seral stage in forest regrowth.

Similar observations were made on the upland grassland at Jimma. This vegetation was used for pasture, and always formed a mosaic with upland evergreen bushland and *Acacia abyssinica* woodland.

#### Seepage grassland

Seepage grassland was studied in detail at Kochi, but also observed near Bonga and at Belleta Forest.

The floristic composition of the dense sward is given in Tab. 11.

#### Conclusion

The affinity between the forests of Ethiopia and East Africa has been discussed above in a separate chapter. Such detailed comparisons are not possible for the herbaceous forest flora or for other vegetation types, but it appears from general comparisons with Jackson (1956), Langdale-Brown et al. (1964) and Lind & Morrison (1974) that similar conclusions can be drawn for the other upland formations. They are all floristically poorer than comparable vegetations in East Africa.

From the number of endemic species in the lists it appears that the degree of endemism in the upland vegetation varies from c. 5% to c. 10%. In his study of the flora of Jebel Marra, Wickens (1976) found a degree of endemism of 1.2% in the upland flora, while White (1978), in a study of the tree flora of the Drakensberg Mts. in southern Africa, found 15 endemic trees in a total of 52 species, or as much as 28%. It is surprising that the upland flora of Ethiopia is so comparably poor both in absolute number of species in each formation and in degree of endemism, as the Ethiopian uplands are by far the largest block of mountains in subsaharan Africa.

The deciduous bushland in southern Ethiopia continues into Somalia and northern Kenya. A degree of endemism estimated on the political boundaries is therefore meaningless for this formation, but the percentage of endemism for this vegetation type is, when estimated from the sample in Tab. 8, at least 15%.

Brenan (1978) published some figures for the degree of endemism in Ethiopia (21%) and Somalia (10%). The first figure is, according to our study, composed of a high figure for the lowland habitat and a lower one for the upland habitats. The Somalian figure will also have to be reconsidered in this light.

## 4. Floristic records and taxonomic observations

The following list enumerates species which have not previously been reported from the provinces where we collected it, or which have never before been reported from Ethiopia. Taxonomic changes which we found necessary during our work with identification of the collections have also been included.

The list is arranged according to the system used by Cufodontis in his standard work on the Ethiopian flora, the *Enumeratio plantarum aethiopiae* (1952–1972), to which we have referred whenever possible as it contains detailed information on synonymy and distribution, both within Ethiopia and generally. In cases where this information is provided by other publications due reference to these has been made. Reference is always made

to more recent floristic literature, to monographs or revisions that have changed the taxonomy adopted in the *Enumeratio*, or to relevant literature about species new to Ethiopia.

Specimens are numbered from 1 to 2350, with the exception of specimens made from living plants brought to Copenhagen for cultivation in the Botanical Garden. These specimens, mainly orchids, are marked in a separate series indicated with the characters DEBL and the two last figures of the year of collection.

Indication of herbaria in which the specimens are deposited are in accordance with edition 6 of the *Index Herbariorum*.

### Pteridophyta

#### Lycopodiaceae (I. Friis)

##### *Lycopodium cernuum* L. 1753

Schelppe 1970: 20.

Syn.: *Lepidoitis cernua* (L.) P.-Beauv. 1804. – Cufodontis 1969b: 252.

Kaffa: Bonga, 1800 m, upland rain forest. 2184 (BR, C, ETH, K, WAG). – Ibidem, 1750 m. 2204 (BR, C, ETH, K, WAG).

New to Kaffa.

##### *Lycopodium clavatum* L. 1753

Cufodontis 1969b: 252; Schelppe 1970: 20.

Kaffa: Mt. Maigudo, 2390 m, upland evergreen bushland. 488 (BR, C, ETH, FI, K, WAG). – Ibidem, 2700 m. 1403 (BR, C, ETH, K).

New to Kaffa.

##### *Lycopodium dacrydioides* Baker 1887

Cufodontis 1952: 177; Schelppe 1970: 18.

Syn.: *Huperzia dacrydioides* (Baker) Cuf. – Cufodontis 1969b: 252.

Kaffa: Aro, 1700–1800 m, 'coffee forest', epiphyte. 154 (BR, C, ETH, FI, K, WAG). – Bonga, 1700 m, upland rain forest, epiphyte. 2081 (BR, C, ETH, K, WAG).

New to Kaffa.

##### *Lycopodium saururus* Lam. 1789

Schelppe 1970: 17.

Kaffa: Mt. Maigudo, 2700 m, upland evergreen bushland. 1422 (BR, C, ETH, K, WAG).

New to Ethiopia.

##### *Lycopodium verticillatum* L.f. 1781

Schelppe 1970: 17.

Kaffa: Bonga, 1700 m, upland rain forest, epiphyte. 2082 (BR, C, ETH, K, WAG).

New to Ethiopia.

#### Selaginellaceae (I. Friis)

##### *Selaginella kalkbreyeri* Baker 1884

Bizzari 1975: 572.

Illubabor: Gabba River, 1200 m, riverine forest. 1722 (C, ETH, K). – S of Bure, 1450 m, riverine forest. 1910 (C, ETH, K).

New to Illubabor.

##### *Selaginella krausiana* (Kunze) A. Braun 1860

Schelppe 1970: 26; Bizzari 1975: 575.

Illubabor: S of Gore, 1750 m, upland rain forest. 1788 (C, ETH, K).

New to Illubabor.

#### Ophioglossaceae (I. Friis)

##### *Ophioglossum polyphyllum* A. Braun 1844.

Pichi-Sermolli 1954: 632; Schelppe 1970: 37.

Syn.: *Ophioglossum capense* sensu auct., non Sw., Cufodontis 1952: 179.

Sidamo: SE of Neghelle, 1300 m, *Acacia* – *Commiphora* bushland. 945 (BR, C, ETH, K, WAG).

New to Sidamo.

**Osmundaceae** (I. Friis)

*Osmunda regalis* L. 1753

Cufodontis 1952: 179; Pichi-Sermolli 1954: 644 & 1964: 10; Cufodontis 1969c: 284; Schelpe 1970: 44.

Kaffa: Bonga, 1900 m, upland rain forest, on rocks in stream. 296 (BR, C, ETH, K, WAG).

Shoa: Entoto Hill, 2700 m, upland evergreen bushland, at small stream. 1186 (BR, C, ETH, K).

New to Kaffa and Shoa.

**Cyatheaceae** (I. Friis)

*Cyathea manniana* W. J. Hooker 1868

Cufodontis 1952: 183; Pichi-Sermolli 1955: 138; Cufodontis 1969b: 254; Schelpe 1970: 72.

Illubabor: S of Gore, 1700 m, upland rain forest, forming almost pure stand at small stream. 1875 (BR, C, ETH, K).

New to Illubabor.

**Hymenophyllaceae** (I. Friis)

*Trichomanes pyxidiferum* L. 1753 var. *melanotrichum* (Schlechtend.) Schelpe 1964

Schelpe 1970: 78.

Syn.: *Vandenboschia melanotricha* (Schlechtend.) Pichi-Serm. 1956. – Pichi-Sermolli 1955: 127.

Illubabor: E of Yaiyo, 1300 m, upland rain forest, on trunks of trees. 1948 (BR, C, ETH, K, WAG).

Kaffa: Bonga, 1700 m, upland rain forest, epiphyte. 2098 (BR, C, ETH, K, WAG).

New to Illubabor and Kaffa.

*Hymenophyllum capillare* Desv. 1827

Schelpe 1970: 80.

Kaffa: Bonga, 1900 m, upland rain forest. 2149 (BR, C, ETH, K, WAG).

New to Ethiopia.

*Hymenophyllum polyanthos* Sw. 1801 var. *kuhnii* (C. Chr.) Schelpe 1966.

Schelpe 1970: 80.

Kaffa: Bonga, 1900 m, upland rain forest. 2152 (BR, C, ETH, FI, K, WAG).

New to Ethiopia.

**Denstaedtiaceae** (E. A. C. L. E. Schelpe)

*Blotiella glabra* (Bory) Tryon 1962

Schelpe 1970: 82.

Illubabor: S of Gore, 1750 m, upland rain forest, at small stream. 1850 (BR, C, ETH, K).

New to Ethiopia.

*Microlepia speluncae* (L.) Moore 1857

Schelpe 1970: 89.

Kaffa: N of Bonga, 1750 m, upland rain forest. 2224 (BR, C, ETH, K).

New to Ethiopia.

**Vittariaceae** (I. Friis)

*Vittaria guineensis* Desv. 1811 var. *orientalis* Hieron. 1915 (det. E. A. C. L. E. Schelpe)

Schelpe 1970: 96.

Kaffa: Bonga, 1900 m, upland rain forest, epiphyte. 327 (BR, C, ETH, K, WAG).

Illubabor: S of Gore, 1750 m, upland rain forest, epiphyte. 1821 (BR, C, ETH, K).

New to Ethiopia.

*Vittaria volkensis* Hieron. 1915

Pichi-Sermolli 1957b: 700; Schelpe 1970: 94.

Sidamo: S of Kebre Mengist, 2100 m, upland rain forest, epiphyte. 1046 (C, ETH, K).

Kaffa: Bonga, 1900 m, upland rain forest, epiphyte. 2129 (C, K).

New to Sidamo and Kaffa.

*Antrophyum mannianum* W. J. Hooker 1861

Schelpe 1970: 96.

Illubabor: S of Gore, 1750 m, upland rain forest, on rock. 1818 (BR, C, ETH, K).

New to Illubabor. – Recorded for the first time for Ethiopia by Schelpe (l.c.) without further locality.

**Adiantaceae** (I. Friis)

*Adiantum philippense* L. 1753

Pichi-Sermolli 1957b: 665; Schelpe 1970: 110.

Syn.: *Adiantum lunulatum* N. L. Burm. 1768. – Cufodontis 1952: 183.

Illubabor: N of Nopa, 1300 m, upland rain forest. 581 (BR, C, ETH, K, WAG).

New to Illubabor.

*Adiantum thalictroides* Schlechtend. 1832

Cufodontis 1952: 183; Pichi-Sermolli 1957b: 687; Cufodontis 1969c: 284.

Syn.: *Adiantum poiretii* sensu auct, non Wikst.: Schelpe 1970: 112.

Kaffa: NW of Jimma, 1900 m, upland evergreen bushland. 285 (BR, C, ETH, K, WAG). – Mt. Maigudo, 2300 m, upland evergreen bushland. 495 (C). – Ibidem, 2650 m. 1455 (C).

New to Kaffa.

*Coniogramme africana* Hieron. 1916 (det. E. A. C. L. E. Schelpe)

Schelpe 1970: 102.

Illubabor: S of Gore, 1750 m, upland rain forest, at small stream. 1847 (BR, C, ETH, K).

Kaffa: Bonga, 1900 m, upland rain forest, at small stream. 2154 (BR, C, ETH, FI, K, WAG).

New to Ethiopia.

*Doryopteris concolor* (Langsd. & Fisch.) Kuhn 1879

Cufodontis 1952: 182; Schelpe 1970: 121.

Illubabor: N of Nopa, 1300 m, upland rain forest. 577 (BR, C, ETH, K, WAG). – S of Bure, 1450 m, riverine forest. 1896 (C, K).

New to Illubabor.

*Pellaea quadripinnata* (Forssk.) Prantl 1882

Cufodontis 1952: 182; Pichi-Sermolli 1964: 11; Schelpe 1970: 133.

Kaffa: Giren, 2000 m, upland evergreen bushland. 1596 (C, ETH, K).

New to Kaffa.

*Pteris cretica* 1767

Cufodontis 1952: 180; Pichi-Sermolli 1964: 10; Schelpe 1970: 116.

Kaffa: Mt. Maigudo, 2350 m, mosaic of upland grassland and upland evergreen bushland. 463 (C).

New to Kaffa.

*Pteris dentata* Forssk. 1775

Cufodontis 1952: 180; Schelpe 1970: 117.

Kaffa: W of Bonga, 1950 m, upland rain forest. 2167 (C, ETH, K). – N of Bonga, 1750 m, clearing in upland rain forest. 2210 (C, K).

New to Kaffa.

*Pteris pteridoides* (W. J. Hooker) Ballard 1937 (det. E. A. C. L. E. Schelpe)

Schelpe 1970: 117.

Syn.: *Pteris brevisora* Baker 1867. – Cufodontis 1952: 180.

Kaffa: Belleta Forest, 2000 m, upland rain forest. 207 (BR, C, ETH, K, WAG). – W of Bonga, 1950 m, upland rain forest. 2172 (BR, C, ETH, K, WAG).

Illubabor: S of Gore, 1750 m, upland rain forest, at small stream. 1816 (C, K).

New to Kaffa and Illubabor.

*Pteris vittata* L. 1753

Cufodontis 1952: 180; Schelpe 1970: 115.

Shoa: Bole Gorge, 1650 m, riverine forest. 1134 (C, ETH, K).

New to Shoa.

**Polypodiaceae** (E. A. C. L. E. Schelpe)

*Pleopeltis excavata* (Willd.) Sledge 1960

Cufodontis 1969b: 256; Schelpe 1970: 151.

Syn.: *Polypodium excavatum* Willd. 1810. – Cufodontis 1952: 189. – *Pleopeltis corradii* (Pichi-Serm.) Copel, ex Cuf. 1952. – Cufodontis 1952: 189.

Kaffa: NW of Aro, 1700–1800 m, 'coffee forest', epiphyte. 151a (C, K).

New to Kaffa.

**Davalliaceae** (I. Friis)

*Oleandra distenta* Kunze 1851

Pichi-Sermolli 1965: 755; Schelpe 1970: 165.

Kaffa: Bonga, 1900 m, upland rain forest. 401 (BR, C, ETH, FI, K, WAG). – Ibidem, 2127 (BR, C, ETH, K, WAG).

New to Kaffa.

**Aspleniaceae** (I. Friis)

*Asplenium linckii* Kuhn 1867

Schelpe 1970: 183.

Kaffa: Bonga, 1700 m, upland rain forest. 2116 (BR, C, ETH, K, WAG).

New to Ethiopia.

*Asplenium inaequilaterale* Willd. 1810. (det. E. A. C. L. E. Schelpe)

Schelpe 1970: 176.

Syn.: *Asplenium laetum* sensu auct., non Sw.: Cufodontis 1952: 187.

Illubabor: S of Bure, 1450 m, riverine forest. 1909 (C, ETH, K). – E of Yaiyo, 1500 m, upland rain forest, at small stream. 2006 (C, ETH, K).

New to Illubabor.

*Asplenium friesiorum* C. Chr. 1924

Schelpe 1970: 178.

Kaffa: Bonga, 1900 m, upland rain forest. 331 (BR, C, ETH, FI, K, WAG). – Ibidem, 2122 (BR, C, ETH, K, WAG).

New to Ethiopia.

*Asplenium demerkense* Hieron. 1911. (det. E. A. C. L. E. Schelpe)

Cufodontis 1952: 187.

Shoa: Ankober, 3050 m, upland evergreen bushland (*Erica arborea* scrub). 1343 (C, ETH, K).

New to Shoa.

*Asplenium bugoiense* Hieron. 1910. (det. E. A. C. L. E. Schelpe)

Faden 1974: 67.

Kaffa: Belleta Forest, 2000 m, upland rain forest. 226 (BR, C, ETH, K, WAG). – Ibidem, 236 (C).

Illubabor: S of Gore, 1750 m, upland rain forest, at stream. 1833 (BR, C, ETH, K).

New to Ethiopia.

*Asplenium buettneri* Hieron. 1910. (det. E. A. C. L. E. Schelpe)

Schelpe 1970: 182.

Sidamo: N of Kebre Mengist, 2100 m, upland rain forest. 1071 (C, ETH, K).

Kaffa: at Gogeb River, 1250 m, riverine forest. 2342 (BR, C, ETH, K).

New to Ethiopia.

*Asplenium abyssinicum* Fée 1852

Cufodontis 1952: 187; Pichi-Sermolli 1964: 12; Cufodontis 1969b: 255.

Kaffa: Bonga, 1900 m, upland rain forest, on rock in stream. 400 (C).

Shoa: Menagesha Forest, 2600 m, upland dry evergreen forest. 1213 (C, ETH, K).

New to Kaffa and Shoa.

*Asplenium monanthes* L. 1767

Cufodontis 1952: 188; Pichi-Sermolli 1964: 12; Cufodontis 1969c: 284; Schelpe 1970: 175.

Kaffa: N of Sheki, 2000 m, upland evergreen bushland. 187

(BR, C, ETH, K). – Mt. Maigudo, 2650 m, upland evergreen bushland (*Erica arborea* – *Hagenia* zone). 1464 (BR, C, ETH, K).

New to Kaffa.

#### **Thelypteridaceae** (E. A. C. L. E. Schelpe)

##### *Thelypteris bergiana* (Schlechtend.) Ching 1941

Schelpe 1970: 193.

Syn.: *Lastrea bergiana* (Schlechtend.) Moore 1858. – Pichi-Sermolli 1964: 12; Cufodontis 1969b: 254.

Shoa: Menagesha Forest, c. 2600 m, dry upland evergreen forest. 1264 (C, K). – Entoto Hill, 2600 m, *Eucalyptus* plantation, at stream. 1305 (C, ETH).

Illubabor: S of Gore, 1750 m, upland rain forest, at small stream. 1849 (BR, C, ETH, K).

New to Shoa and Illubabor. – Holttum (1974: 133) refers to this species as *Amauropelta bergiana* (Schlechtend.) Holtt.

##### *Thelypteris confluens* (Thunb.) Morton 1967

Schelpe 1970: 190.

Kaffa: Kochi, 1750 m, upland grassland with seepage. 598 (C). – Mt. Maigudo, 2400 m, upland evergreen bushland (*Erica arborea*), at waterhole. 1537 (BR, C, ETH, K).

New to Kaffa. – Holttum (1974: 151) records this species from Ethiopia without further locality.

##### *Thelypteris gueinziana* (Mett.) Schelpe 1965

Schelpe 1970: 194.

Kaffa: Enkulo, 1700 m, upland grassland. 81 (BR, C, ETH, K, WAG).

New to Kaffa. – Holttum (1974: 147) refers to this species as *Christella gueinziana* (Mett.) Holtt. and records it from Ethiopia without further locality.

##### *Thelypteris longispis* (Baker) Schelpe 1965

Schelpe 1970: 192.

Sidamo: N of Kebre Mengist, 2100 m, upland rain forest, on rocky slope. 1068 (C, ETH, K).

Kaffa: N of Bonga, 1750 m, upland rain forest, on slope. 2227 (C, ETH, K).

New to Sidamo and Kaffa. – Recorded from Ethiopia without further locality by Schelpe (l.c.) and Holttum (1974: 138). The latter refers to this species as *Pseudocyclosorus pulcher* (Willd.) Holtt.

##### *Thelypteris madagascariensis* (Fée) Schelpe 1965

Schelpe 1970: 196.

Illubabor: S of Gore, 1750 m, upland rain forest. 1796 (BR, C, ETH, K).

Kaffa: Bonga, 1700 m, upland rain forest, forest edge. 2132 (BR, C, ETH, K).

New to Ethiopia. – Holttum (1974: 155) refers to this species as *Pneumatopteris unita* (Kunze) Holtt.

##### *Thelypteris oppositifformis* (C. Chr.) Ching 1941

Kaffa: Mt. Maigudo, 2650 m, upland evergreen bushland (*Erica arborea* zone). 1466 (BR, C, ETH, K, WAG).

New to Kaffa. – Holttum (1974: 135) records this species from Ethiopia without further locality, referring

to the species as *Amauropelta oppositifformis* (C. Chr.) Holtt.

##### *Thelypteris pozoi* (Lagasca) Morton 1959

Schelpe 1970: 199.

Syn.: *Dryopteris africana* (Desv.) C. Chr. 1905. – Cufodontis 1952: 185. – *Leptogramma pozoi* (Lagasca) Heywood 1961. – Pichi-Sermolli 1964: 12.

Shoa: Menagesha Forest, 2600 m, upland dry evergreen forest, at small stream. 1211 (C, ETH, K).

New to Shoa. – Holttum (1974: 149) refers to this species as *Stenogramma pozoi* (Lagasca) K. Iwats.

#### **Athyriaceae** (E. A. C. L. E. Schelpe)

##### *Athyrium scandicinum* (Willd.) C. Presl 1836 var. *scandicinum*

Schelpe 1970: 204.

Illubabor: S of Gore, 1750 m, upland rain forest, at small stream. 1817 (BR, C, ETH, K).

New to Ethiopia.

#### **Aspidiaceae** (I. Friis)

##### *Ctenitis cirrhosa* (Schumach.) Ching 1940

Schelpe 1970: 232.

Kaffa: W of Bonga, 1950 m, upland rain forest. 2168 (BR, C, ETH, K, WAG).

New to Ethiopia.

##### *Didymochlaena truncatula* (Sw.) J. Sm. 1841

Schelpe 1970: 220.

Illubabor: S of Gore, 1750 m, upland rain forest, at small stream. 1848 (BR, C, ETH, K).

New to Ethiopia.

##### *Polystichum seriferum* (Forssk.) Woyнар 1913 var. *fuscopaleaceum* (Alston) Schelpe 1967. (det. E. A. C. L. E. Schelpe)

Cufodontis 1952: 185 (without indication of variety; Schelpe 1970: 226).

Syn.: *Polystichum fuscopaleaceum* Alston 1956. – Pichi-Sermolli 1964: 13; Cufodontis 1969b: 254; Hedberg 1971: 106.

Kaffa: W of Bonga, 1950 m, upland rain forest. 2172 (BR, C, ETH, K, WAG).

New to Kaffa.

#### **Blechnaceae** (I. Friis and E. A. C. L. E. Schelpe)

##### *Blechnum tabulare* (Thunb.) Kuhn 1868

Schelpe 1970: 237.

Syn. nov.: *Blechnum wolamense* Cuf. 1969. – Cufodontis 1969b: 255.

Kaffa: Mt. Maigudo, 2400 m, upland evergreen bushland. 1526 (BR, C, ETH, K, WAG).

New to Kaffa. – Cufodontis described *Blechnum wolamense* on material from the mountains in NW Sidamo, just opposite Mt. Maigudo on the other side of the Omo Valley (Kuls 527, FR, holotype). The Ethiopian material does not appear to be in any way distinct



from *Blechnum tabulare*, which according to Schelpe (l.c.) is distributed from the Table Mt. at the Cape to Uganda. Cufodontis' species is thus not tenable, and the S Ethiopian material must be referred to *Blechnum tabulare*.

## Angiospermae: Dicotyledones

### Piperaceae (I. Friis)

*Peperomia rotundifolia* (L.) H.B.K. 1815

Düll 1973: 85.

Syn.: *Peperomia bangrooana* C. DC. 1866. – Andrews 1950: 23; Agnew 1974: 85.

Kaffa: Gogeb River, 1250 m, riverine forest, epiphytic (Fig. 15). 2336 (BR, C, ETH, K, WAG).

New to Kaffa. – Düll (l.c.) records this species for Ethiopia for the first time (Fig. 15).

*Piper umbellatum* L. 1753

Andrews 1950: 23; Agnew 1974: 88.

Illubabor: N of Nopa, 1300 m, upland rain forest. 574 (BR, C, ETH, K, WAG). – E of Yaiyo, 1300 m, riverine forest. 1963 (BR, C, ETH, K, WAG).

New to Ethiopia.

### Moraceae (I. Friis)

*Dorstenia ellenbeckiana* Engl. 1902

Cufodontis 1953: 8.

Sidamo: W of Filtu, 1250 m, *Acacia-Commiphora* bushland. 1015 (C, ETH, K).

New to Sidamo. – This is probably the third gathering of this species which is endemic to S Ethiopia and N Kenya.

*Dorstenia foetida* (Forssk.) Schweinf. 1896

Cufodontis 1953: 8.

Sidamo: W of Filtu, 1250 m, *Acacia-Commiphora* bushland. 1016 (C, ETH, K).

New to Sidamo.

*Dorstenia barnimiana* Schweinf. 1862

Rendle 1916: 70; Cufodontis 1953: 7; Sebald 1969: 5.

Syn. nov.: *Dorstenia palmata* (Schweinf.) Engl. 1894. – Rendle 1916: 72; Chiovenda 1939: 35 & Fig. 1; Cufodontis 1953: 9.

Sidamo: S of Waddere, 1600 m, deciduous woodland derived from upland dry evergreen forest. 860 (C, ETH, K). Plants in this gathering have entire leaves (Fig. 16). – Ibidem, 861 (C, ETH). Plants in this gathering have palmate leaves. – SE of Neghelle, 1400 m, grassland. 875 (C, ETH, K). Plants in this gathering have entire, ± auriculate leaves (Fig. 16).

Both *Dorstenia barnimiana* and *Dorstenia palmata* include, as defined in the latest revision of the group by Rendle (1916), forms with entire and palmate leaves. In order to distinguish between the two species Rendle stressed the difference in shape of receptacle and in position of receptacular appendages: to *D. barnimiana*

are referred specimens with oblong to linear receptacles and both terminal and lateral appendages, to *D. palmata* are referred specimens with narrowly triangular receptacles and appendages from apex and base only. Our material, together with material studied at K and BM, shows, however, a wide range of intermediate forms between the types described by Rendle. *D. palmata* is therefore reduced to a synonym of *D. barnimiana*, but further studies are needed to show whether an infraspecific classification is desirable.

### Urticaceae (I. Friis)

*Pilea tetraphylla* (Steud.) Blume 1856

Cufodontis 1953: 19.

Kaffa: Yebu, 2000 m, 'coffee forest'. 66 (BR, C, ETH, K, WAG).

New to Kaffa.

*Pilea rivularis* Wedd. 1856

Letouzey 1968: 163.

Syn.: *Pilea ceratomera* Wedd. 1869.

Kaffa: Belleta Forest, 2000 m, upland rain forest, at small stream. 257 (BR, C, EA, ETH, FI, K, WAG).

Shoa: Menagesha Forest, 2600 m, upland dry evergreen forest, in damp valley. 1215 (C, ETH, K).

Illubabor: S of Gore, 1750 m, upland rain forest, at small stream. 1786 (BR, C, ETH, K).

New to Ethiopia. – The name *Pilea ceratomera* has been widely used for this species but Letouzey (l.c.) considers it a synonym of *Pilea rivularis* Wedd., described from the Comoro Is.

*Debregeasia bicolor* (Roxb.) Wedd. 1869

Cufodontis 1953: 20.

Shoa: Bole Gorge, 1650 m, riverine forest, on vertical rocks above stream. 1135 (C, ETH, K).

New to Shoa.



Fig. 15. *Peperomia rotundifolia* on a horizontal branch in the riverine forest at Gogeb River (Kaffa) at 1250 m.

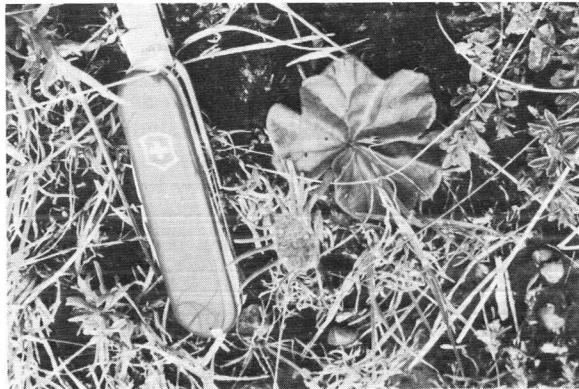


Fig. 16. *Dorstenia barnimiana* in bushland between Waddere and Neghelle (Sidamo) at 1600 m.

*Parietaria debilis* Forst. 1786

Cufodontis 1953: 21.

Shoa: Entoto Hill, 2650 m, *Eucalyptus* plantation, at small stream. 1384 (C, ETH, K).

New to Shoa.

*Droguetia iners* (Forssk.) Schweinf. 1896

Cufodontis 1953: 22.

Kaffa: Bonga, 1800 m, upland rain forest. 371 (BR, C, EAH, ETH, FI, K, WAG).

Shoa: Menagesha Forest, 2600 m, upland dry evergreen forest. 1214 (C, ETH, K). – Entoto Hill, 2600 m, *Eucalyptus* plantation, at small stream. 1296 (C).

Illubabor: N of Nopa, 1200 m, upland rain forest. 573 (C, K). – E of Yaiyo, 1500 m, upland rain forest. 2019 (C, ETH, K).

New to Shoa, Kaffa, and Illubabor.

**Proteaceae** (I. Friis)

*Protea madiensis* Oliv 1875

Cufodontis 1962c: 303; Beard 1963: 156; Sebald 1969: 7.

Kaffa: S of Sheki, 1625 m, *Protea-Piliostigma* wooded grassland. 1691 (BR, C, ETH, K, WAG). – At Gogeb River, 1250 m, wooded grassland. 2355 (BR, C, ETH, K).

This is a further record of this species which has recently been discovered from the river valleys of the NW Highlands.

**Opiliaceae** (I. Friis)

*Opilia celtidifolia* (Guill. & Perr.) Walp. 1842

Cufodontis 1953: 25.

Illubabor: at Baro River, 550 m, riverine forest. 1922 (C, ETH, K).

New to Illubabor. – This species is probably widespread in the W Ethiopian lowland.

**Olacaceae** (I. Friis)

*Ximinia americana* L. 1753

Cufodontis 1953: 25; Sebald 1969: 8; De Filippis 1976: 180.

Illubabor: at Baro River, 800 m, deciduous woodland. 1934 (C, ETH, K).

New to Illubabor.

**Loranthaceae** (I. Friis)

*Loranthus globiferus* A. Rich. 1847

Cufodontis 1953: 28 & 1958b: 107.

Kaffa: NW of Jimma, 1700 m, 'coffee forest'. 84 (C, ETH, K). – Aro, 1700–1800 m, 'coffee forest'. 135 (BR, C, ETH, K, WAG). – Bonga, 1800 m, upland evergreen bushland. 381 (BR, C, ETH, K).

New to Kaffa.

*Loranthus macrosolen* A. Rich 1847

Cufodontis 1953: 30.

Kaffa: Folla, 2100 m, *Acacia abyssinica* woodland. 536 (BR, C, ETH, K, WAG).

New to Kaffa.

*Viscum nervosum* A. Rich. 1847

Cufodontis 1953: 34.

Shoa: Awash River at Koka Dam, 1600 m, riparian scrub. 721 (BR, C, ETH, K).

New to Shoa.

**Polygonaceae** (K. Vollesen)

*Polygonum afromontanum* Greenway 1952

Cufodontis 1958b: 112, Tab. 7, Fig. 2.; Hedberg 1962: 424 & map 3.

Kaffa: Sheki, 2600 m, upland evergreen bushland. 1622 (BR, C, ETH, K, WAG).

New to Kaffa. – This is the first record of the species W of Rift Valley. For a map of the general distribution of this strictly Afromontane species, see Hedberg (l.c.).

*Polygonum pulchrum* Blume 1825

Cufodontis 1953: 43, pro parte, excl. *P. setosulum* A. Rich. (as '*P. setulosum*' in Cufodontis l.c.); Graham 1958: 20; Sebald 1969: 8.

Kaffa: N of Bonga, 1750 m, upland rain forest, edge of forest swamp. 2217 (BR, C, ETH, K, WAG).

New to Kaffa.

*Polygonum setosulum* A. Rich. 1851

Graham 1958: 22; Sebald 1969: 9.

*Polygonum pulchrum* sensu auct., non Blume: Cufodontis 1953: 43.

Illubabor: S of Gore, 1750 m, upland rain forest, at small stream. 1789 (C). – 1836 (C, ETH, K).

Kaffa: at Gogeb River, 1250 m, riverine forest, in moist ravine. 2337 (C, ETH, K).

New to Illubabor and Kaffa.

*Polygonum salicifolium* Willd. 1809

Cufodontis 1953: 43.

Illubabor: Metu, 1520 m, riparian scrub of *Salix subserrata*. 562 (BR, C, ETH, K, WAG). – E of Yaiyo, 1600 m, upland rain forest, at small stream. 1996 (C, ETH, K).

Kaffa: Kochi, 1740 m, in floating bog of *Leersia hexandra*.

605 (C). – N of Bonga, 1750 m, upland rain forest, edge of forest swamp. 2221 (BR, C, ETH, K).  
New to Illubabor and Kaffa.

**Amaranthaceae** (K. Vollesen)

*Celosia schweinfurthiana* Schinz 1895

Cufodontis 1953: 56; Sebald 1969: 10; Townsend 1975: 17.  
Illubabor: E of Yaiyo, 1450 m, 'coffee forest'. 1980 (BR, C, ETH, K).  
New to Illubabor.

*Cyathula achyranthoides* (H. B. K.) Moq. 1849

Hauman 1951: 64.  
Kaffa: S of Sheki, 1750 m, upland rain forest. 1686 (BR, C, ETH, K).  
New to Ethiopia.

*Cyathula prostrata* (L.) Blume 1825

Cufodontis 1953: 65.  
Illubabor: E of Yaiyo, 1500 m, clearing in upland rain forest. 2013 (C, ETH, K).  
New to Illubabor.

**Nyctaginaceae** (I. Friis)

*Boerhavia coccinea* Mill. 1768

Cufodontis 1953: 76; Sebald 1969: 11.  
Illubabor: at Baro River, 550 m, riverine forest. 1925 (C, ETH, K).  
New to Illubabor.

*Pisonia aculeata* L. 1753

Keay 1956: 177; Agnew 1974: 161.  
Illubabor: E of Yaiyo, 1300 m, riverine forest. 1958 (BR, C, ETH, K).  
New to Ethiopia.

**Basellaceae** (I. Friis)

*Basella alba* L. 1753

Verdcourt 1968: 2.  
Syn.: *Basella rubra* L. 1753. – Cufodontis 1953: 92; Sebald 1969: 13.  
Kaffa: Bonga, 1900 m, edge of upland rain forest. 294 (C). – 2141 (C, ETH, K).  
New to Kaffa.

**Caryophyllaceae** (K. Vollesen)

*Stellaria mannii* J. D. Hook. 1864

Turrill 1956: 24; Hedberg 1971: 107.  
Illubabor: S of Gore, 1750 m, upland rain forest. 1770 (BR, C, ETH, K).  
New to Illubabor.

*Stellaria sennii* Chiov. 1940

Cufodontis 1953: 93.  
Kaffa: Bonga, 1800 m, edge of upland rain forest. 407 (C, K).

Illubabor: S of Gore, 1700 m, upland rain forest. 1857 (BR, C, ETH, K, WAG).  
New to Kaffa and Illubabor.

*Stellaria media* (L.) Vill. 1789

Cufodontis 1953: 92.  
Kaffa: Jimma, 1700 m, in compound of Jimma Agricultural School. 2034 (C, ETH, K).  
New to Kaffa.

*Cerastium afromontanum* T. C. E. Fries & Weim. 1929

Turrill 1956: 21; Hedberg 1971: 108.  
Kaffa: Mt. Maigudo, 2700 m, upland evergreen bushland. 1420 (BR, C, ETH, K).  
This is the third record of this species from Ethiopia, the two first being cited by Hedberg from Arussi and Kaffa.

*Cerastium octandrum* A. Rich. 1847

Cufodontis 1953: 93 & 1958b: 114; Hedberg 1962: 424; Sebald 1969: 13; Hedberg 1971: 107.  
Kaffa: Mt. Maigudo, 2400 m, upland evergreen bushland, at moist places. 518 (C).  
Sidamo: S of Agere Selam, 2650 m, upland rain forest (*Hagenia abyssinica* zone). 754 (BR, C, ETH, K).  
New to Kaffa and Sidamo.

*Minuartia filifolia* (Forssk.) Mattf. 1921

Cufodontis 1953: 94; Sebald 1969: 14.  
Shoa: Ankober, 3050 m, upland evergreen bushland (*Erica arborea* zone). 1364 (BR, C, ETH, K).  
New to Shoa.

*Spergula arvensis* L. 1753

Cufodontis 1953: 95; Sebald 1969: 14.  
Kaffa: Sheki, 2600 m, cultivated fields. 1630 (BR, C, ETH, K).  
New to Kaffa.

*Uebelinia abyssinica* Hochst. 1841

Cufodontis 1953: 101; Sebald 1969: 14.  
Kaffa: Mt. Maigudo, 2400 m, upland evergreen bushland, at moist places. 519 (C).  
Sidamo: S of Agere Selam, 2650 m, upland rain forest (*Hagenia abyssinica* zone). 754 (BR, C, ETH, K).  
New to Kaffa and Sidamo.

**Cabombaceae** (I. Friis)

*Brasenia schreberi* J. F. Gmel. 1791

Verdcourt 1971a: 1.  
Kaffa: W of Jimma, 1750 m, small pool in open upland evergreen bushland. 129 (BR, C, ETH, FI, K, WAG).  
New to Ethiopia.

**Ceratophyllaceae** (I. Friis)

*Ceratophyllum demersum* L. 1753

Cufodontis 1953: 106; Sebald 1969: 15.  
Kaffa: Kochi, 1740 m, pool in upland grassland. 608 (BR, C, ETH, FI, K, WAG). – 2068 (BR, C, ETH, K).  
New to Kaffa.

**Ranunculaceae** (I. Friis & K. Vollesen)

*Clematis grandiflora* DC. 1818

Milne-Redhead & Turrill 1952: 2.

Syn. nov.: *Clematis longicauda* A. Rich. 1847. – Cufodontis 1953: 108 & 1962c: 305; Sebald 1969: 15.

Illubabor: at Gabba River, 1200 m, clearing in upland rain forest. 1741 (C).

Kaffa: Kochi, 1690 m, open upland evergreen bushland (Fig. 17). 2075 (BR, C, ETH, FI, K, WAG).

New to Kaffa and Illubabor. – The Ethiopian material of this species does not differ from material from the type locality in West Africa. There is thus no reason for recognizing A. Richard's *Clematis longicauda* (described on material from Tigre Province in N Ethiopia) as a distinct taxon (Fig. 17).

*Thalictrum rhynchocarpum* Dillon & A. Rich. 1847

Cufodontis 1953: 111 & 1958b: 115; Hedberg 1962: 426; Sebald 1969: 15.

Kaffa: Belleta Forest, 2000 m, clearing in upland rain forest. 267 (C). – Bonga, 1900 m, upland rain forest, at river. 300 (C, ETH, K). – 2192 (C, ETH).

New to Kaffa.

**Menispermaceae** (I. Friis)

*Tiliacora troupinii* Cuf. 1958

Cufodontis 1958b: 116 & Tab. 9, Fig. 4; Benvenuto 1974: 23.

Syn.: *Tiliacora funifera* sensu auct., non (Miers) Oliv.: Troupin 1962: 59.

Kaffa: Belleta Forest, 2000 m, upland rain forest. (♂-plant). 230 (C). – Ibidem (♀-plant, Fig. 18). 234 (BR, C, EA, ETH, FI, K, WAG).

Illubabor: S of Gore, 1750 m, upland rain forest (♀-plant). 1814 (BR, C, ETH, K). – E of Yaiyo, 1500 m, upland rain forest. 2023 (BR, C, ETH, K).

New to Illubabor. – Our material, which include both ♂- and ♀-plants, confirms that Troupin (l.c.) was incorrect in considering this taxon conspecific with *T. funifera* of C and E Africa. It is, as recognized by Benvenuto (l.c.), a distinct species endemic to the upland rain forest of Ethiopia (Fig. 18).

**Annonaceae** (K. Vollesen)

*Artabotrys monteiroae* Oliver 1888

Verdcourt 1971b: 62.

Kaffa: at Gogeb River, 1400 m, riverine forest. 2316 (BR, C, ETH, K, WAG).

New to Ethiopia.

*Uvaria angolensis* Oliver 1868

Verdcourt 1971b: 15.

Kaffa: at Gogeb River, 1400 m, riverine forest. 2320 (BR, C, ETH, K, WAG).

New to Ethiopia.

**Lauraceae** (I. Friis)

*Ocotea kenyensis* (Chiov.) Robyns & Wilcz. 1951

Robyns & Wilczek 1951: 406; Dale & Greenway 1961: 242.

Syn.: *Ocotea viridis* Kosterm. 1938. – Andrews 1950: 8; Cufodontis 1958b: 118.

Kaffa: Bonga, 1850 m, upland rain forest, 334 (BR, C, ETH, K). – 338 (C, K). – 2125 (BR, C, ETH, FI, K, WAG).

New to Kaffa. – Cufodontis (l.c.) records this tree for the first time from Ethiopia (Sidamo Province).

*Cassytha filiformis* L. 1753

Cufodontis 1954: 117.

Sidamo: SE of Neghelle, 1300 m, *Acacia-Commiphora* bushland. 974 (C, ETH, K).

New to Ethiopia. – Cufodontis (l.c.) records it from Somalia.

**Capparidaceae** (I. Friis)

*Cleome schimperi* Pax 1891

Cufodontis 1954: 123; Sebald 1969: 18.

Illubabor: S of Gore, 1750 m, clearing in upland rain forest. 1837 (C, ETH, K).

Kaffa: Bonga, 1700 m, clearing in upland rain forest. 2119 (C, K). – W of Bonga, 1600 m, upland rain forest. 2194 (BR, C, ETH, K, WAG).

New to Illubabor and Kaffa.

*Ritchiea albersii* Gilg 1903

Elffers et al. 1964: 21.

Syn.: *Ritchiea steudneri* Gilg 1903. – Cufodontis 1954: 125 & 1962c: 305.



Fig. 17. *Clematis grandiflora* in open evergreen bushland at Jimma (Kaffa) at 1690 m.

Illubabor: Gore, 1900 m, 'coffee forest'. 589 (BR, C, ETH, FI, K, WAG). – E of Metu, 1650 m, 'coffee forest'. 1767 (BR, C, ETH, K). – E of Yaayo, 1300 m, riverine forest., 1973 (BR, C, ETH, K).

New to Illubabor.

*Maerua oblongifolia* (Forssk.) A. Rich. 1847

Cufodontis 1954: 138 & 1958b: 119.

Illubabor: W of Bure, 700 m, deciduous woodland. 1915 (BR, C, ETH, K, WAG).

New to Illubabor.

*Maerua triphylla* A. Rich. 1847 var. *calophylla* (Gilg) De Wolf 1962.

Elffers et al. 1964: 43 & 48.

Syn.: *Maerua pirottae* Gilg 1896. – Cufodontis 1954: 138. Illubabor: at Baro River, 550 m, upper edge of riverine forest. 1926 (C, ETH, K).

New to Illubabor.

#### Cruciferae (I. Friis)

*Cardamine africana* L. 1753

Cufodontis 1954: 153; Hedberg 1962: 426.

Kaffa: NW of Aro, 1700–1800 m, 'coffee forest'. 133 (BR, C, ETH, FI, K, WAG).

Shoa: Menagesha Forest, 2600 m, upland dry evergreen forest. 1274 (C, ETH).

Illubabor: E of Yaayo, 1500 m, upland rain forest, at small stream. 2018 (BR, C, ETH, K).

New to Kaffa, Shoa and Illubabor.

*Cardamine trichocarpa* A. Rich. 1847

Cufodontis 1954: 153; Sebald 1969: 19.

Kaffa: NW of Aro, 1700–1800 m, 'coffee forest'. 134 (C).

Illubabor: S of Gore, 1750 m, upland rain forest. 1879 (BR, C, ETH, K).

New to Kaffa and Illubabor.

*Capsella bursa-pastoris* (L.) Medic. 1792

Cufodontis 1954: 154.

Kaffa: Sheki, 2600 m, cultivated fields. 1632 (C).

New to Kaffa.

#### Podostemonaceae (I. Friis)

*Sphaerothylax abyssinica* (Wedd.) Warming 1890

Cufodontis 1964: 164; Agnew 1974: 110.

Syn. nov.: *Sphaerothylax sanguinea* Chiov. 1911. – Cufodontis 1954: 164.

Kaffa: Bonga, 1900 m, on rocks in fast running water from waterfall (Fig. 19). 303 (BR, C, ETH, FI, K, WAG).

Shoa: Bole Gorge, 2300 m, on rocks in a small stream. 1161 (C, ETH).

New to Kaffa and Shoa. – The typical material of *Sphaerothylax sanguinea* Chiov. (Chioyenda 2939, FI) does not differ from the known material of *Sphaerothylax abyssinica* (Schimper 1181, K, isotype from Gaffat in Begemder; de Wilde 8978, C, from Ambo in Shoa; and our material). Chioyenda (1911:

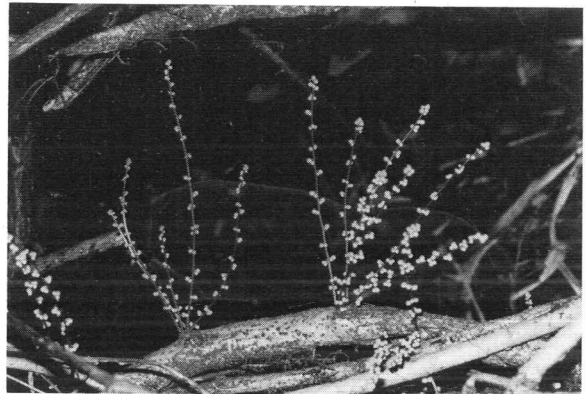


Fig. 18. *Tiliacora troupinii* in upland rain forest in Belleta Forest (Kaffa) at 2000 m.

132) states that *Sphaerothylax abyssinica*, according to the illustrations given by Warming (1891: 145 & 147) and the description and illustration by Oliver (1895: Tab. 2356), differs from *Sphaerothylax sanguinea* in having longer bracts enclosing the completely glabrous spatella, in having leaves and clustered spatellas on the free stems, and in having erect stigmas on top of the ovaries. A study of the material available now, together with the illustrations cited, leaves the impression that the length of the bracts, the number of flowers in a cluster and the direction of the stigmas are very variable characters, even within the same individual. Also the colouring of the 'thallus' may vary from bronze to green in the same specimen. The absence or presence of hairs or leaves are characters correlated with the seasonal aspect of the plant. As furthermore the distribution and habitat of *Sphaerothylax sanguinea* fall entirely within the range of *Sphaerothylax abyssinica* it seems justified to reduce the former to a synonym of the latter.

The species has long been considered endemic to Ethiopia but has recently been reported from Kenya (Agnew l.c.). (Fig. 19).

#### Crassulaceae (I. Friis)

*Crassula alsinoides* (J. D. Hook.) Engl. 1892

Cufodontis 1954: 170.

Kaffa: Belleta Forest, 2000 m, open parts of upland rain forest. 229 (BR, C, EA, ETH, FI, K, WAG).

New to Kaffa.

#### Hamamelidaceae (I. Friis)

*Trichocladus ellipticus* Eckl. & Zeyh. 1837

Cufodontis 1954: 175 & 1958b: 123.

Kaffa: at Gogeb River, 1250 m, riverine forest. 2346 (BR, C, ETH, K, WAG).

New to Kaffa.

**Rosaceae** (I. Friis)

*Rubus apetalus* Poir. 1804

Graham 1960: 39; Sebald 1969: 23.

Syn.: *Rubus exsuccus* A. Rich. 1847. – Cufodontis 1954: 176.

Kaffa: Giren, 1900 m, upland evergreen bushland. 93 (C, K). – Belleta Forest, 2000 m, clearing in upland rain forest. 215 (BR, C, ETH, K, WAG).

Illubabor: S of Gore, 1700 m, upland rain forest. 1872 (C).  
New to Kaffa and Illubabor.

*Alchemilla fischeri* Engl. 1892

Cufodontis 1954: 180; Graham 1960: 17.

Kaffa: Bonga, 1900 m, spray zone at waterfall in upland rain forest. 307 (BR, C, ETH, K). – 318 (BR, C, ETH, K, WAG). – W. of Bonga, 1950 m, upland rain forest, at small stream. 2181 (BR, C, ETH, K, WAG).

Illubabor: S of Gore, 1750 m, upland rain forest, at small stream. 1826 (BR, C, ETH, K).

New to Kaffa and Illubabor. – *Alchemilla erlangeriana* Engl. 1911 (Cufodontis 1954: 179 & 1958b: 124) may be conspecific with *A. fischeri* but the original material of *A. erlangeriana* (Ellenbeck 1778 & 1871, both from Sidamo Province) seems to be destroyed, and the description is not detailed enough to allow any definitive conclusion.

**Mimosaceae** (I. Friis)

*Albizia grandibracteata* Taub. in Engl. 1895

Cufodontis 1962c: 308.

Illubabor: Metu, 1500 m, wooded grassland. 529 (BR, C, EAH, ETH, FI, K, WAG). – Ibidem, 1650 m, 'coffee forest'. 1700 (C). – At Gabba River, 1200 m, edge of riverine forest. 1736 (C, ETH, K). Kaffa: at Gogeb River, 1400 m, edge of riverine forest. 2303 (BR, C, ETH, K, WAG).

New to Illubabor and Kaffa.

*Albizia malacophylla* (A. Rich.) Walp. 1851–52

Cufodontis 1954: 184; Brenan 1959: 145.

Syn.: *Albizia elliptica* Fourn. 1860. – Cufodontis 1954: 184.

Illubabor: at Baro River, 550 m, riverine forest. 1930 (C, ETH, K).

New to Illubabor.

**Caesalpinaceae** (I. Friis)

*Cassia baccarinii* Chiov. 1915

Cufodontis 1954: 215; Valenti 1971: 34.

Sidamo: E of Neghelle, 1250 m, *Acacia-Commiphora* bushland. 996 (C, ETH, K).

New to Sidamo.

*Cassia floribunda* Cav. 1802

Brenan 1967: 70.

Syn.: *Cassia laevigata* Willd. 1809. – Cufodontis 1958b: 294.

Kaffa: SW of Jimma, 1750 m, open upland evergreen bushland. 116 (BR, C, ETH, K, WAG). – Giren, 2000 m, upland evergreen bushland. 1555 (BR, C, ETH, K, WAG).

New to Kaffa. – This species is a native of S America but seems now to be widely naturalized in upland evergreen bushland in SW Ethiopia.

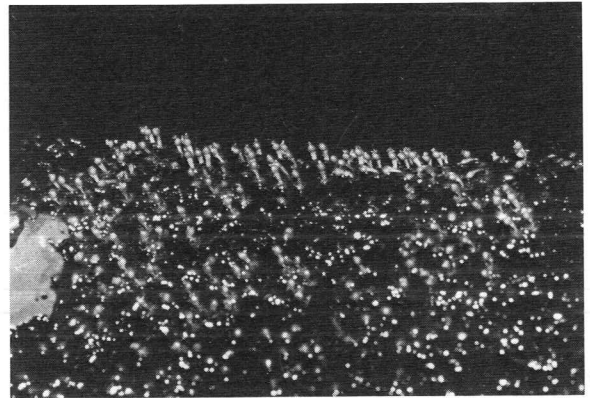


Fig. 19. *Sphaerothylax abyssinica* from river near Bonga (Kaffa) at 1900 m.

*Cassia petersiana* Bolle 1861

Cufodontis 1954: 219; Sebald 1969: 26; Valenti 1971: 10.

Illubabor: Nopa, 1300 m, upland evergreen bushland. 564 (BR, C, ETH, K, WAG). – Gabba River, 1200 m, riverine forest. 1716 (C, ETH, K). – E. of Yaiyo, 1500 m, clearing in upland rain forest. 2010 (C, ETH, K).

New to Illubabor.

*Parkinsonia scioana* (Chiov.) Brenan 1963

Brenan 1967: 43.

Syn.: *Peltophorum scioanum* (Chiov.) E. G. Baker 1930. – Cufodontis 1955: 224. – *Peltophoropsis scioana* Chiov. 1915. – Roti-Michelozzi 1957: 221.

Sidamo: E of Neghelle, 1250 m, *Acacia-Commiphora* bushland. 997 (C, ETH, K).

New to Sidamo. – According to Roti-Michelozzi (l.c.) this species has been recorded from N Kenya, just S of the border with Ethiopia (Gillett 13, 308 & 13, 463), but our specimen would appear to be the first record from Sidamo proper.

*Caesalpinia decapetala* (Roth) Alston 1931

Cufodontis 1955: 223; Brenan 1967: 36.

Kaffa: Giren, 2000 m, upland evergreen bushland, at a fence. 1557 (BR, C, ETH, K, WAG).

New to Kaffa. – According to Brenan (l.c.) often planted as a hedge plant in E Africa and becoming naturalized. This is also the case in S Ethiopia.

*Tamarindus indica* L. 1753

Cufodontis 1955: 211 & 1958b: 293; Roti-Michelozzi 1957: 134; Sebald 1969: 27.

Illubabor: at Baro River, 550 m, riverine forest. 1931 (C, ETH, K).

New to Illubabor.

*Pterolobium stellatum* (Forssk.) Brenan 1954

Cufodontis 1955: 221 & 1958b: 294; Roti-Michelozzi 1957: 181; Sebald 1969: 27.

Kaffa: Nadda, 1800 m, *Acacia* wooded grassland. 428 (C, K).

New to Kaffa.

**Papilionaceae** (I. Friis)

*Crotalaria emarginella* Vatke 1878 (det. R. M. Polhill)

Cufodontis 1955: 230; Polhill 1971: 956.

Sidamo: SE of Neghelle, 1600 m, *Acacia-Commiphora* bushland. 1009 (C, ETH, K).

New to Sidamo.

*Crotalaria hyssopifolia* Klotzsch 1862 (det. R. M. Polhill)

Cufodontis 1955: 231; Sebald 1969: 27; Polhill 1971: 991.

Kaffa: at Gogeb River, 1400 m, deciduous woodland. 2313 (BR, C, ETH, K, WAG).

New to Kaffa.

*Crotalaria keniensis* E. G. Baker 1926 (det. R. Polhill)

Kaffa: Yebu, 2000 m, 'coffee forest'. 19 (BR, C, ETH, K, WAG). – W of Bonga, 1800 m, upland rain forest, at small pool. 350 (BR, C, ETH, FI, K, WAG). – Bonga, 1800 m, clearing in upland rain forest. 391 (C, ETH, K).

New to Kaffa.

*Crotalaria leptocarpa* Balf. f. 1888 (det. M. Thulin)

Cufodontis 1955: 233; Polhill 1971: 948.

Sidamo: W of Filtu, 1200 m, *Acacia-Commiphora* bushland. 1024 (C, ETH, K).

New to Ethiopia.

*Crotalaria pycnostachya* Benth. 1843 (det. R. Polhill)

Cufodontis 1955: 237; Polhill 1971: 903.

Shoa: at Awash River at Koka Dam, 1600 m, river bank. 706 (C, ETH, K).

New to Shoa.

*Crotalaria quartiniana* A. Rich. 1847 (det. R. Polhill)

Cufodontis 1955: 237; Sebald 1969: 28; Polhill 1971: 863.

Kaffa: S of Sheki, 1750 m, upland rain forest. 1646 (C, ETH, K). –

Illubabor: at Gabba River, 1200 m, upland rain forest. 1747 (BR, C, ETH, K).

New to Kaffa and Illubabor.

*Argyrolobium fischeri* Taub. 1895

Polhill 1971: 1002.

Kaffa: Mt. Maigudo, 2400 m, upland evergreen bushland. 1542 (BR, C, ETH, K, WAG).

New to Kaffa. – Polhill (l.c.) records this species for Ethiopia without further locality.

*Argyrolobium ramosissimum* Baker 1871

Cufodontis 1955: 242, Sebald 1969: 28; Polhill 1971: 1008.

Shoa: Entoto Hill, 2700 m, *Eucalyptus* plantation, open glades. 1182 (C, ETH, K). – Ibidem, 2600 m, 1315 (C, ETH, K). – Menagesha Forest, 2700 m, upland evergreen bushland (*Erica arborea* zone). 1243 (C, K).

New to Shoa.

*Trifolium cryptopodium* A. Rich. 1847

Cufodontis 1955: 251; Sebald 1969: 29.

Kaffa: Sheki, 2600 m, upland grassland. 1607 (C, ETH, K).

New to Kaffa.

*Indigofera arrecta* A. Rich. 1847

Cufodontis 1955: 261; Gillett 1958: 105 & 1971: 307.

Kaffa: S of Jimma, 1700 m, upland evergreen bushland. 171 (BR, C, ETH, K, WAG).

New to Kaffa.

*Indigofera atriceps* J. D. Hook. ssp. *setosissima* (Harms) Gillett 1958

Gillett 1958: 79 & 1971: 282.

Kaffa: Giren, 1900 m, *Acacia abyssinica* woodland. 86 (BR, C, ETH, K, WAG). – Ibidem, 2000 m, upland evergreen bushland. 1560 (BR, C, ETH, K, WAG). – Bellesta Forest, 2000 m, upland rain forest, clearing. 266 (BR, C, ETH, FI, K, WAG).

New to Kaffa. – Gillett (l.c.) records this species from Ethiopia without further locality.

*Indigofera brevicalyx* E. G. Baker. 1903

Cufodontis 1955: 263; Gillett 1958: 43 & 1971: 243; Sebald 1969: 30.

Sidamo: SE of Neghelle, 1300 m, *Acacia-Commiphora* bushland. 939 (C, ETH, K).

New to Sidamo. – Our plant has the characteristic 'blisters' mentioned by Gillett (l.c.).

*Indigofera roseo-coerulea* E. G. Baker 1926

Gillett 1958: 95 & 1971: 299.

Kaffa: Mt. Maigudo, 2550 m, upland evergreen bushland (*Hagenia* zone). 1512 (C).

New to Kaffa. – Gillett (1971) records this species for S Ethiopia without further locality.

*Indigofera spicata* Forssk. 1775

Gillett 1958: 119 & 1971: 317; Sebald 1969: 31.

Syn.: *Indigofera hendecaphylla* Jacq. 1788. – Cufodontis 1955: 265.

Illubabor: E of Yaiyo, 1500 m, upland rain forest, roadside. 2008 (BR, C, ETH, K).

New to Illubabor.

*Tephrosia vogelii* J. D. Hook. 1849

Gillett 1971: 210.

Kaffa: W of Bonga, 1900 m, upland rain forest, roadside. 352 (BR, C, ETH, FI, K, WAG). – Ibidem, 1950 m. 2246 (BR, C, ETH, K).

New to Kaffa. – Gillett (l.c.) records this species for Ethiopia without further locality. The plant is widely used as a fish poison; a large part, perhaps the whole, of its distribution in E Africa is due to this cause (Gillett l.c.).

*Sesbania dummeri* Phill. & Hutch. 1921

Gillett 1963: 109 & 1971: 336.

Kaffa: W of Bonga; 1800 m; upland rain forest, moist ground. 356 (BR, C, ETH, K, WAG).

Illubabor: N of Nopa, 1300 m, upland rain forest, at small stream. 570 (BR, C, ETH, K, WAG). – At Gabba River, 1200 m, riverine forest. 1746 (C, ETH, K).

New to Kaffa and Illubabor. – Gillett (1971) records this species for S. Ethiopia without further locality.

*Smithia elliotii* E. G. Baker 1929 var. *elliotii*

Verdcourt 1970: 16 & 1971c: 408.

Kaffa: N of Bonga, 1750 m, upland rain forest, at small stream. 2242 (BR, C, ETH, K, WAG).

New to Ethiopia. – Hitherto only *Smithia abyssinica* (A. Rich.) Verdc. 1970 (Syn.: *Smithia sensitiva* Ait. var. *abyssinica* A. Rich. & *Smithia erubens* sensu E. G. Baker 1929, non (E. Mey.) E. G. Baker. – Cufodontis 1955: 296) has been recorded from that country.

*Zornia pratensis* Milne-Redh. 1954 ssp. *pratensis*

Cufodontis 1955: 297; Sebald 1969: 32.

Kaffa: at Gogeb River, 1400 m, wooded grassland. 2287 (BR, C, ETH, K, WAG).

New to Kaffa.

*Desmodium ramosissimum* G. Don 1832

Schubert 1971: 464.

Kaffa: Nadda, 1800–1900 m, *Acacia* woodland. 445 (BR, C, ETH, K, WAG). – At Gogeb River, 1250 m, wooded grassland. 2283 (BR, C, ETH, K, WAG).

New to Ethiopia.

*Dalbergia lactea* Vatke 1879

Cufodontis 1955: 304; Polhill 1971: 111.

Syn.: *Dalbergia macrothyrza* sensu auct., non Harms: Cufodontis 1955: 304. – *Dalbergia sciadendron* Chiov. 1937: Cufodontis 1955: 305.

Shoa: Bole Gorge, 1650 m, riverine forest. 1101 (C, ETH, K).

New to Shoa. – This species is widespread in the wetter parts of Ethiopia and occurs in the riverine forests in the deep valleys of the plateau.

*Lonchocarpus laxiflorus* Guill. & Perr. 1832

Cufodontis 1955: 305 & 1962c: 310.

Illubabor: at Baro River, 550 m, upper edge of riverine forest. 1932 (C, ETH, K).

New to Illubabor.

*Amphicarpa africana* (J. D. Hook.) Harms 1921 (det. B. Verdcourt)

Cufodontis 1955: 313.

Kaffa: Mt. Maigudo, 2550 m, upland evergreen bushland. 1514 (C, ETH, K).

New to Kaffa.

*Dumasia villosa* DC. 1825

Verdcourt 1971c: 513.

Kaffa: Bonga, 2000 m, upland rain forest, clearing. 412 (BR, C, EAH, ETH, FI, K, WAG).

New to Kaffa. – Verdcourt (l.c.) records this species for Ethiopia without further indication of locality.

*Teramnus micans* (E. G. Baker) E. G. Baker 1928 var. *cyaneus* (De Wildem.) Hauman 1954

Verdcourt 1970: 281 & 282, & 1971c: 540 & 541.

Illubabor: E of Yaiyo, 1600 m, 'coffee forest'. 1986 (BR, C, ETH, K).

New to Ethiopia.

*Erythrina brucei* Schweinf. emend. Gillett 1962

Cufodontis 1955: 317 & 1958b: 300; Gillett 1962: 428.

Kaffa: Bonga, 1800 m, upland rain forest. 370 (C).

New to Kaffa. – It is uncertain whether all localities cited by Cufodontis in 1955 refer to *Erythrina brucei*, as the identity of this species was first established by Gillett in 1962.

*Eriosema psoraleoides* (Lam.) G. Don 1832

Cufodontis 1955: 328.

Kaffa: E of Bonga, 1500 m, wooded grassland. 2274 (C, K).

New to Kaffa.

*Vigna schimperi* J. G. Baker 1871 (det. B. Verdcourt)

Cufodontis 1955: 335.

Kaffa: Mt. Maigudo, 2000–2300 m, open upland evergreen bushland. 466 (BR, C, ETH, FI, K, WAG).

New to Kaffa.

*Lablab purpureus* (L.) Sweet 1827 ssp. *uncinatus* Verdc. 1970 (det. B. Verdcourt)

Verdcourt 1970: 410 & 1971c: 696 & 699.

Syn.: *Lablab niger* Medik. 1787 var. *uncinatus* (A. Rich.) Cuf. 1955, nom. nud. – Cufodontis 1955: 339 & 1969a: XXV.

Illubabor: SW of Bure, 1450 m, riverine forest. 1912 (C, ETH, K). – E of Yaiyo, 1600 m, clearing in upland rain forest. 1993 (BR, C, ETH, K).

New to Illubabor.

*Baphia abyssinica* Brummitt 1968

Brummitt 1968: 526.

Illubabor: at Gabba River, 1220 m, riverine forest. 1729 (BR, C, ETH, K).

Kaffa: at Gogeb River, 1250 m, riverine forest. 2343 (C, ETH, K).

This is the third record of this species. Brummitt (l.c.) records it from the Boma Plateau (SE Sudan) and one locality in Illubabor.

## Rutaceae (I. Friis)

*Zantoxylum usambarense* (Engl.) Kokwaro 1978

Kokwaro 1978: 798.

Syn.: *Fagara usambarenis* Engl. 1905. – Cufodontis 1956: 367.

Sidamo: S of Waddere, 1600 m, bushland with *Cussonia holstii* and *Tarchonanthus camphoratus*. 823 (C, ETH, K).

New to Sidamo.

*Toddalea asiatica* (L.) Lam. 1793

Cufodontis 1956: 369 & 1958b: 305.

Kaffa: Giren, 2000 m, upland evergreen bushland. 1589 (BR, C, ETH, K).

New to Kaffa.

## Simaroubaceae (I. Friis)

*Kirkia tenuifolia* Engl. 1902

Cufodontis 1956: 375.



Sidamo: W of Filtu, 1250 m, *Acacia-Commiphora* bushland. 1010 (C).  
New to Sidamo.

#### **Burseraceae** (I. Friis)

*Boswellia neglecta* S. Moore 1877

Cufodontis 1956: 377.

Sidamo: SE of Neghelle, 1300 m, wooded grassland. 967 (C, ETH, K).

New to Sidamo. – This species is very near and perhaps not distinct from *Boswellia hildebrandtii* Engl. 1893, described from Teita Hills in Kenya, *Boswellia multifoliolata* Engl. 1898, described from S Somalia, and *Boswellia elegans* Engl. 1904, described from Tsavo in Kenya.

#### **Meliaceae** (I. Friis)

*Turraea holstii* Gürke 1894

Cufodontis 1956: 399.

Illubabor: E of Yaiyo, 1300 m, riverine forest. 1952 (BR, C, ETH, K, WAG).

New to Illubabor.

*Turraea nilotica* Kotschy & Peyr. 1867

Cufodontis 1956: 400.

Illubabor: at Baro River, 550 m, riverine forest. 1919 (BR, C, ETH, K).

New to Illubabor.

*Lepidotrichilia volkensii* (Gürke) Leroy 1963

White & Styles 1963: 305.

Syn.: *Trichilia volkensii* Gürke 1894. – Cufodontis 1956: 402 & 1958b: 307 & 1962c: 312.

Kaffa: Belleta Forest, 2000 m, upland rain forest. 227 (BR, C, EAH, ETH, FI, K, WAG). – S of Sheki, 1750 m, upland rain forest. 1665 (C, ETH, K).

Illubabor: S of Gore, 1750 m, upland rain forest. 1780 (C, ETH, K).

New to Kaffa and Illubabor.

*Ekebergia capensis* Sparrm. 1779

White & Styles 1963: 316.

Syn.: *Ekebergia ruelandiana* (Fresen.) A. Rich. 1847. – Cufodontis 1956: 401 & 1958b: 306.

Syn. nov.: *Polyscias lepidota* Chiov. 1940. – Cufodontis 1959: 636.

Kaffa: NW of Jimma, 2000 m, isolated tree in upland evergreen bushland. 150 (BR, C, ETH, K, WAG). – SE of Folla, 2350 m, isolated tree in farmland. 535 (C). – Mt. Maigudo, 2550 m, upland evergreen bushland. 1498 (BR, C, ETH, K, WAG).

Cufodontis records this plant from all parts of the NW and the SE Highlands. It is common around Jimma in upland evergreen bushland and patches of upland rain forest. – The type specimen of *Polyscias lepidota* Chiov. (Chiuderi 239, from the surroundings of Jimma) has been examined at FI. The specimen, identified by Chiovenda as a species of *Polyscias* (Araliaceae), consists of a rachis of a pinnate leaf and a number of leaflets. Closer studies of this material has convinced me (I.

Friis) that it is a fragmentary leaf of *Ekebergia capensis*. The specimen has the characteristic morphology of the leaflets of *Ekebergia capensis*, the lenticles of the rachis and the characteristic epidermis of the underside of the leaflets fit very well. *Polyscias fulva* was the only species of *Polyscias* seen around Jimma. On these grounds I consider *Polyscias lepidota* a synonym of *Ekebergia capensis*.

#### **Malpighiaceae** (I. Friis)

*Caucanthus auriculatus* (Radlk.) Niedenzu 1915

Cufodontis 1956: 403 & 1958b: 307.

Shoa: at Awash River near Koka Dam, 1600 m, *Acacia-Commiphora* bushland. 703 (C, ETH, K).

New to Shoa.

#### **Euphorbiaceae** (I. Friis)

*Phyllanthus boehmii* Pax 1893

Cufodontis 1956: 413; Sebald 1970: 4.

Kaffa: Kochi, 1740 m, upland grassland with oozing water. 40 (BR, C, ETH, K). – Jimma, 1700 m, coffee plantation. 1401 (BR, C, ETH, FI, K, WAG).

New to Kaffa.

*Phyllanthus limuensis* Cuf. 1949 (det. I. Friis and A. Radcliffe-Smith)

Cufodontis 1948: 484 & 1956: 414; Sebald 1970: 6.

Illubabor: E of Yaiyo, 1600 m, upland rain forest, at brooklet. 1991 (BR, C, ETH, K).

Kaffa: N of Bonga, 1750 m, upland rain forest. 2240 (BR, C, ETH, K, WAG).

New to Illubabor. – Our specimens represent the third and fourth records of this species.

The material matches the type (Bieber s.n., 16. – 18.5. 1905, WU) and Sebald's specimen from Begemder (Sebald 2591, STU), although our specimens have slightly larger leaves.

*Phyllanthus odontadenius* Muell. Arg. 1864 (det. A. Radcliffe-Smith)

Andrews 1952: 95; Agnew 1974: 212.

Sidamo: S of Waddere, 1600 m, bushland with *Cussonia holstii* and *Tarchonanthus camphoratus*. 854 (BR, C, ETH, K).

New to Ethiopia.

*Phyllanthus pseudo-niruri* Muell. Arg. 1864 (det. A. Radcliffe-Smith)

Andrews 1952: 93.

Illubabor: S of Gore, 1750 m, upland rain forest, at small stream. 1794. (C, K).

Kaffa: W of Bogna, 1600 m, upland rain forest, forest swamp. 2195 (BR, C, ETH, K, WAG).

New to Ethiopia.

*Phyllanthus reticulatus* Poir (det. A. Radcliffe-Smith)

Cufodontis 1956: 415.

Kaffa: at Gogeb River, 1250 m, riverine forest, on riverbank. 2340 (C, ETH, K).

New to Kaffa.

*Argomuellera macrophylla* Pax 1895

Andrews 1952: 56; Dale & Greenway 1961: 185.

Illubabor: at Gabba River, 1200 m, riverine forest. 1721 (C, ETH, K). – SW of Bure, 1450 m, riverine forest 1892 (BR, C, ETH, K). – E of Yaiyo, 1300 m, riverine forest 1942 (BR, C, ETH, K).

Kaffa: at Gogeb River, 1250 m, riverine forest. 2344 (BR, C, ETH, K, WAG).

New to Ethiopia.

*Bridelia micrantha* (Hochst.) Baill. 1862–63

Cufodontis 1956: 418; Sebald 1970: 8.

Shoa: Bole Gorge, 1650 m, riverine forest. 1136 (C, ETH, K).

New to Shoa.

*Acalypha indica* L. 1753

Cufodontis 1956: 425.

Sidamo: SE of Neghelle, 1300 m, *Acacia-Commiphora* bushland. 965 (C, ETH, K).

New to Sidamo.

*Acalypha psilostachya* A. Rich. 1851

Cufodontis 1956: 426.

Kaffa: N of Aro, 1700–1800 m, 'coffee forest'. 139 (BR, C, ETH, FI, K, WAG). – Mt. Maigudo, 2650 m, upland evergreen bushland (with *Erica arborea*). 1457 (BR, C, ETH, K).

Illubabor: N of Gore, 1900 m, 'coffee forest'. 594 (BR, C, ETH, K, WAG). – E of Yaiyo, 1300 m, riverine forest. 1995 (BR, C, ETH, K).

New to Kaffa and Illubabor.

*Erythrococca trichogyne* (Muell. Arg.) Prain 1911 (det. A. Radcliffe-Smith)

Radcliffe-Smith 1978: 238.

Kaffa: S of Sheki, 1750 m, upland rain forest. 1649 (C, ETH, K).

New to Ethiopia. – Radcliffe-Smith (l.c.) has recently revised the tropical African species of *Erythrococca* and reduced a number of names to synonyms of *Erythrococca trichogyne* (Muell. Arg.) Prain. Thus delimited, the species is recorded from Ethiopia, E Africa, E Zaire, N Zambia, Malawi, Zimbabwe, Mozambique and Angola (Radcliffe-Smith, personal communication).

*Macaranga kilimandscharica* Pax 1895

Dale & Greenway 1961: 208.

Syn. nov.: *Macaranga lophostigma* Chiov. 1940. – Cufodontis 1956: 423. – *Macaranga capensis* (Baill.) Sim ssp. *giordanii* Cuf. 1958. – Cufodontis 1958b: 308.

Kaffa: Yebu, 2000 m, 'coffee forest'. 158 (BR, C, ETH, FI, K, WAG). – Belleta Forest, 2000 m, upland rain forest. 260 (BR, C, ETH, FI, K, WAG), 263 (BR, C, ETH, K, WAG).

Illubabor: S of Gore, 1750 m, upland rain forest. 1785 (BR, C, ETH, K).

*Macaranga lophostigma* Chiov. and *M. capensis* Sim ssp. *giordanii* Cuf. are based on the same type, Giordano 2471, FI, from Saio in SW Wollega. Although Cufodontis introduced a new epithet, his subspecies is clearly based on Chiovenda's species. Ssp. *giordanii* is said to differ from ssp. *capensis* in lacking the long, ferruginous hairs on the petiole and the nerves on the lower

surface of the leaves. This difference, however, is also one of the differences separating *M. kilimandscharica* from *M. capensis*. Another difference is found in general leafshape: mature leaves of *Macaranga capensis* are usually deeply cordate, whereas *M. kilimandscharica* has peltate leaves with rounded base. *M. kilimandscharica* is a species of upland rain forest, whereas *M. capensis* is widespread at lower altitudes. The Ethiopian material, both the type material and our specimens, agree well with E. African specimens of *M. kilimandscharica*, and the specific and subspecific names previously used for the Ethiopian plants are therefore reduced to synonyms. – *M. kilimandscharica* is a common plant in the lower strata of the upland rain forests of SW Ethiopia.

*Jatropha curcas* L. 1753

Cufodontis 1956: 432.

Illubabor: at Baro River, 550 m, edge of riverine forest. 1927 (C, ETH, K).

New to Illubabor. – A native species in tropical America, now widely cultivated and naturalized in the tropics of the Old World.

*Jatropha hildebrandtii* Pax 1894 (det. A. Radcliffe-Smith)

Cufodontis 1956: 433.

Sidamo: W of Filtu, 1250 m, *Acacia-Commiphora* bushland. 1011 (C, ETH, K).

New to Ethiopia. – Hitherto only known from NE Kenya, but indicated with doubt from S Somalia by Cufodontis (l.c.).

*Euphorbia acalyphoides* Boiss. 1862

Cufodontis 1956: 442.

Sidamo: SE of Neghelle, 1600 m, *Acacia-Commiphora* bushland. 912 (C). – Ibidem, 1300 m. 956 (C, ETH, K).

New to Sidamo.

*Euphorbia glochidiata* Pax 1897 (det. Susan Holmes)

Cufodontis 1956: 446; Agnew 1974: 223.

Sidamo: E of Neghelle, 1250 m, *Acacia-Commiphora* bushland. 993 (C, K).

New to Ethiopia. – Cufodontis (l.c.) records this species as endemic to Ethiopia, but Agnew l.c. also records it for Kenya.

*Euphorbia gorinii* Chiov. 1932 (det. Susan Holmes)

Chiovenda 1932: 401; Cufodontis 1956: 446.

Sidamo: SE of Neghelle, 1300 m, *Acacia-Commiphora* bushland. 944 (C, K). – W of Filtu, 1250 m, *Acacia-Commiphora* bushland. 1000 (BR, C, ETH, K).

New to Ethiopia. – Our material agrees with the type material and the illustration and description given by Chiovenda (l.c.), but the ♀-pedicel is too long and the leaves are subopposite.

*Euphorbia hirta* L. 1753

Cufodontis 1956: 449; Sebald 1970: 12.

Kaffa: at Gogeb River, 1400 m, wooded grassland. 2294 (BR, C, ETH, K, WAG).  
New to Kaffa.

*Euphorbia hypericifolia* L. 1753

Cufodontis 1956: 449; Sebald 1970: 12.

Kaffa: at Gogeb River, 1400 m, wooded grassland. 2284 (C, K). – Ibidem, 1250 m. 2348 (BR, C, ETH, K).  
New to Kaffa.

*Euphorbia jatrophioides* Pax 1903 (det. J. Radcliffe-Smith)

Cufodontis 1956: 450.

Sidamo: SE of Neghelle, 1600 m, *Acacia-Commiphora* bushland. 879 (BR, C, ETH, K, WAG).

New to Sidamo. – *Euphorbia leucochlamys* Chiov. 1929 (Cufodontis 1958a: 451; Type: Stefanini & Puccioni 939, FI) seems to be closely related, but the material is too scarce to permit any taxonomic conclusions.

*Euphorbia polyantha* Pax 1909

Agnew 1974: 223.

Sidamo: SE of Neghelle, 1300 m, *Acacia-Commiphora* bushland. 946 (BR, C, ETH, K).

New to Ethiopia.

**Anacardiaceae** (I. Friis)

*Rhus glutinosa* A. Rich. 1847

Cufodontis 1958a: 473 & 1962c: 312; Sebald 1970: 14.

Shoa: Menagesha Forest, 2700 m, upland evergreen bushland (*Erica arborea* zone). 1258 (C, ETH, K).

New to Shoa.

**Hippocrateaceae** (I. Friis)

*Hippocratea goetzei* Loes. 1901

Cufodontis 1958a: 484, 1960b: 371 & 1962c: 314; Robson 1966: 4.

Illubabor: S of Gore, 1750 m, upland rain forest. 1770 (BR, C, ETH, K).

Kaffa: N of Bonga, 1750 m, upland rain forest. 2213 (BR, C, ETH, K).

New to Illubabor and Kaffa. – The collection from Kaffa is the first known record of fruits in this species. The fruit consists of 3 green mericarps, 4–5 × 3–3.7 cm, flattened, obovate to broadly obovate in outline, with apiculate apex.

*Hippocratea pallens* Oliv. 1868

Cufodontis 1960b: 371; Robson 1966: 416.

Syn: *Apodostigma pallens* (Oliv.) Wilcz. 1960. – Cufodontis 1958a: 484.

Illubabor: E of Yaiyo, 1300 m, riverine forest. 1947 (BR, C, ETH, K).

New to Illubabor.

*Salacia congolensis* de Wild. & Th. Dur. 1899

Robson 1966: 398.

Illubabor: at Gabba River, 1200 m, riverine forest. 1728 (BR, C, ETH, K).

Kaffa: at Gogeb River, 1400 m, riverine forest. 2314 (BR, C, ETH, K, WAG).

New to Kaffa and Illubabor. – Recorded from Ethiopia by Robson (l.c.) without further locality.

**Sapindaceae** (I. Friis)

*Deinbollia kilimandscharica* Taub. 1895

Hauman 1960: 336; Dale & Greenway 1961: 509.

Kaffa: Bonga, 1900 m, upland rain forest. 312 (BR, C, ETH, FI, K, WAG).

Illubabor: S of Gore, 1750 m, upland rain forest. 1876 (C, K).

New to Ethiopia. – A common species in the lowest stratum of the upland rain forest.

*Blighia unijugata* J. G. Baker 1868

Hauman 1960: 316; Dale & Greenway 1961: 507.

Illubabor: E of Yaiyo, 1400 m, upland rain forest. 1975 B. (BR, C, ETH, K).

New to Ethiopia.

*Lecaniodiscus fraxinifolius* J. G. Baker 1868

Dale & Greenway 1961: 514; Exell 1966: 530.

Illubabor: at Baro River, 550 m, riverine forest. 1916 (C, ETH, K).

New to Ethiopia.

**Vitaceae** (I. Friis)

*Rhoicissus revouilii* Planch. 1887

Cufodontis 1958a: 505.

Kaffa: at Gogeb River, 1250 m, wooded grassland at edge of riverine forest. 2212 (BR, C, ETH, K, WAG).

New to Kaffa.

*Cissus populnea* Guill. & Perr. 1831

Cufodontis 1958a: 510.

Illubabor: SW of Bure, 1450 m, riverine forest. 1913 (C, ETH, K).

New to Illubabor.

**Tiliaceae** (I. Friis)

*Triumfetta flavescens* A. Rich. 1847

Cufodontis 1958a: 527; Sebald 1970: 19.

Syn. nov.: *Triumfetta neghellensis* Lanza 1939. – Lanza 1939: 124; Cufodontis 1958a: 528.

Sidamo: SE of Neghelle, 1300 m, *Acacia-Commiphora* bushland. 960 (C, ETH, K).

*Triumfetta flavescens* is a very widespread species in Ethiopia. Our material agrees well both with typical material of that species and with the types of *Triumfetta neghellensis* Lanza (Cufodontis 40 & 214, FI). There is nothing in the description of *Triumfetta neghellensis* which warrants the recognition of this as a distinct species.

**Malvaceae** (K. Vollesen)

*Lavatera abyssinica* Hutch. & Bruce 1941

Cufodontis 1959: 540.

Kaffa: Mt. Maigudo, 2650 m, upland evergreen bushland (*Erica arborea* zone). 1449 (BR, C, ETH, K).

New to Kaffa. – This is the first record W of the Rift Valley of this montane endemic Ethiopian species.

*Sida veronicifolia* Lam. 1783

Andrews 1952: 41; Agnew 1974: 201.

Illubabor: N of Yaiyo, 1450 m, 'coffee forest'. 1982 (BR, C, ETH, K).

New to Ethiopia.

*Pavonia hildebrandtii* Gürke 1912

Cufodontis 1959: 548.

Sidamo: SE of Neghelle, 1600 m, *Acacia-Commiphora* bushland. 914 (C, ETH, K).

New to Ethiopia. – This species is very close to *Pavonia serrata* Franch. 1882 from NE Somalia.

*Pavonia kilimandscharica* Gürke 1894

Cufodontis 1959: 548.

Kaffa: Belleta Forest, 2000 m, upland rain forest, clearing. 225 (BR, C, ETH, K, WAG).

New to Kaffa.

**Sterculiaceae** (I. Friis)

*Melhania steudneri* Schweinf. 1868

Cufodontis 1959: 579.

Syn. nov.: *Melhania zavattarii* Cuf. 1939. – Cufodontis 1939: 136 & 1959: 579.

Sidamo: Neghelle, 1500 m, open upland evergreen bushland derived from upland dry evergreen forest (with a few *Juniperus procera* and *Barbeya oleoides* left from the forest). 865 (BR, C, ETH, K).

Our material is collected on the type locality of *Melhania zavattarii* Cuf. and matches the type material (Cufodontis 248, FI) in almost all characters. According to Cufodontis (1939) *Melhania zavattarii* is very near to *Melhania steudneri* A. Rich., from which it differs chiefly in the glabrous upper surface of the leaves. Our material has scattered stellate hairs on the upper leaf-surface. The character appears to be variable and as no other taxonomic distinction has been found the two taxa are here considered conspecific.

**Guttiferae** (I. Friis)

*Garcinia buchananii* E. G. Baker 1894

Andrews 1950: 214; Bamps 1970: 66.

Syn.: *Garcinia huillensis* auct., non Welw. ex Oliv. – Dale & Greenway 1961: 231.

Kaffa: at Gogeb River, 1250 m, riverine forest (Fig. 20). 2333 (BR, C, ETH, K, WAG).

New to Ethiopia (Fig. 20).

**Flacourtiaceae** (I. Friis)

*Oncoba routledgei* Sprague 1911

Sleumer 1975: 17.

Kaffa: Bonga, 1700 m, upland rain forest. 2118 (C, ETH, K).

New to Kaffa. – Sleumer (l.c.) records this species for Ethiopia without further locality. Previously all material of *Oncoba* has been referred to *Oncoba spinosa* Forssk. which is restricted to riverine forests and riparian woodland.

**Begoniaceae** (I. Friis)

*Begonia wollastonii* E. G. Baker 1908

Wilczek 1969: 47.

Syn. nov.: *Begonia abyssinica* Cuf. 1960. – Cufodontis 1960b: 382 & tab. 64, Fig. 9.

Kaffa: Bonga, 1900 m, upland rain forest, in the spray from waterfall. 306 (BR, C, ETH, FI, K, WAG).

New to Kaffa. – The description of *Begonia abyssinica* Cuf. was based on Kuls 718, FR, from Mt. Dita in Gamu – Gofa. The type specimen consists of a leaf and a ♂-flower, both illustrated in Cufodontis l.c. Our material, which consists of several plants and includes both ♂- and ♀-flowers, matches the illustration and description of *Begonia abyssinica* Cuf. very well, and is collected in a similar habitat about 100 km from the type locality. Our material must be referred to *Begonia wollastonii* E. G. Baker from the highland areas between NE Zaire and Uganda, and *Begonia abyssinica* Cuf. should therefore be considered a synonym of that previously established name. It is interesting to note that Wilczek (l.c.) indicates the distribution of *Begonia wollastonii* E. G. Baker as Zaire ('Lacs Edouard et Kivu', which is the northeastern phytogeographical province of Zaire), Uganda and Ethiopia. The record from Ethiopia is not further commented on, by Wilczek. Our material also shows some similarity to the East African species *Begonia kenyensis* Gilg. which, however, differs in having hairy leaves.

**Thymelaeaceae** (I. Friis)

*Gnidia claessensii* Staner 1935

Aymonin 1966: 56.

Sidamo: S of Waddere, 1600 m, bushland with *Cussonia holstii* and *Tarchonanthus camphoratus*. 793 (BR, C, ETH, FI, K, WAG).

New to Ethiopia.

**Lythraceae** (I. Friis)

*Lythrum salicaria* L. 1753

Schoch-Bodmer 1935: 31.

Syn.: *Lythrum hyssopifolia* (p.p.) auct., non L.: Cufodontis 1959: 610.

Shoa: Awash River at Koka Dam, 1600 m, riverbank. 726 (BR, C, ETH, K). Cufodontis (l.c.) cites '*Lythrum salicaria* auct., non L.: Schoch-Bodmer' in the synonymy of *Lythrum*

*hyssopifolia*. Schoch-Bodmer (l.c.) indicated isolated localities for *Lythrum salicaria* in Ethiopia at Lake Zwai, at Mt. Zuquala and at the rivers Maki and Awash.

The species is not known elsewhere in tropical Africa. Our specimens are the common Eurasian *Lythrum salicaria* L. and our observation thus supports the information in Schoch-Bodmer l.c., which is based on old records. It is uncertain whether these well established Ethiopian populations are native or naturalized. The nearest undoubtedly native populations of *Lythrum salicaria* L. are in Morocco, Algeria, Syria and Israel.

#### Rhizophoraceae (I. Friis)

*Cassipourea malosana* (Baker) Alston 1925

Cufodontis 1959: 614; Arena & Orsino 1973: 137.

Illubabor: E of Yaiyo, 1300 m, riverine forest. 1944 (BR, C, ETH, K).

New to Illubabor.

#### Combretaceae (I. Friis)

*Combretum aculeatum* Vent. 1803

Cufodontis 1959: 615.

Sidamo: at Genale Doria, 1100 m, dry scrub. 1033 (C, ETH, K).

New to Sidamo.

*Combretum fragrans* F. Hoffm. 1889. (det. G. Wickens)

Wickens 1973: 29.

Syn.: *Combretum ghasalense* Engl. & Diels 1899. – Cufodontis 1959: 617 & 1962b: 291.

Illubabor: SW of Bure, 800 m, deciduous woodland. 1936 (C, ETH, K).

New to Illubabor.

#### Myrtaceae (I. Friis)

*Eugenia bukobensis* Engl. 1899

Boutique 1968: 25.

Illubabor: at Gabba River, 1200 m, riverine forest. 1726 (BR, C, ETH, K, WAG).



Fig. 20. *Garcinia buchananii* in the riverine forest at Gogeb River (Kaffa) at 1250 m.

New to Ethiopia. – The leaves and flower buds of our material appear to be larger than in the material from Uganda, but resemble those of material from E Zaire. The species has not been recorded from the Sudan.

#### Melastomataceae (I. Friis)

*Dissotis canescens* (E. Mey. ex Graham) J. D. Hook. 1871

Cufodontis 1959: 629.

Kaffa: Kochi, 1740 m, in floating bog. 597 (BR, C, ETH, FI, K, WAG). – N of Bonga, 1750 m, swamp in upland rain forest. 2208 (BR, C, ETH, K, WAG).

New to Kaffa.

#### Araliaceae (I. Friis)

*Schefflera myriantha* (Baker) Drake 1897

Bamps 1974: 17.

Syn.: *Schefflera polysciada* Harms 1895. – Cufodontis 1959: 635.

Kaffa: Bonga, 1950 m, upland rain forest. 415 (C). – N of Bonga, 1750 m, upland rain forest. 2212 (BR, C, ETH, K, WAG).

Illubabor: S of Gore, 1750 m, upland rain forest. 1885 (BR, C, ETH, K).

New to Kaffa and Illubabor.

*Cussonia arborea* A. Rich. 1847

Cufodontis 1959: 636; Sebald 1970: 25.

Kaffa: at Gogeb River, 1250 m, wooded grassland. 2357 (BR, C, ETH, K, WAG).

New to Kaffa.

*Cussonia ostinii* Chiov. 1911

Cufodontis 1959: 636 & 1962c: 320; Sebald 1970: 25.

Kaffa: Mt. Maigudo, 2100 m, wooded grassland (Fig. 21). 450 (BR, C, ETH, K). – SE of Folla, 1900 m, wooded grassland. 539 (C).

New to Kaffa. (Fig. 21).

#### Umbelliferae (I. Friis)

*Hydrocotyle mannii* J. D. Hook. 1864

Cufodontis 1962c: 320.

Sidamo: N of Kebre Mengist, 2100 m, upland rain forest, swamp. 1058 (C, ETH, K).

New to Sidamo.

*Hydrocotyle ranunculoides* L.f. 1781

Cufodontis 1959: 632.

Shoa: Bole Gorge, 1650 m, shallow pond at the river. 1127 (C, ETH, K).

New to Shoa.

*Anthriscus sylvestris* (L.) Hoffm. 1814

Cufodontis 1959: 639.

Shoa: Entoto Hill, 2600 m, *Eucalyptus* plantation, at small stream. 1289 (C).

New to Shoa.

*Agrocharis incognita* (Norman) Heywood & Jury 1978

Heywood & Jury 1978: 573.

Syn.: *Caucalis incognita* Norman 1934. – Cufodontis 1959: 640; Sebald 1970: 22.

Kaffa: Belleta Forest, 2000 m, upland rain forest, at small stream. 244 (BR, C, ETH, K). – Mt. Maigudo, 2650 m, upland evergreen bushland (*Erica arborea* zone). 1452 (BR, C, ETH, K).

Sidamo: N of Kebre Mengist, 2100 m, upland rain forest. 1076 (C, ETH, K).

New to Kaffa and Sidamo.

*Cryptotaenia africana* (J. D. Hook.) Drude 1898

Jacques-Felix 1970: 83; Agnew 1974: 355.

Kaffa: Bonga, 1850 m, upland rain forest, clearing. 310 (BR, C, EAH, ETH, FI, K, WAG). – Ibidem, 1700 m, 2131 (BR, C, ETH, K, WAG).

New to Ethiopia.

#### Primulaceae (K. Vollesen)

*Ardisiandra sibthorpioides* J. D. Hook. 1864

Cufodontis 1960a: 657; Hedberg 1962: 430; Bizzari 1970: 673.

Shoa: Menagesha Forest, 2600 m, upland dry evergreen forest. 1269 (C).

Kaffa: Mt. Maigudo, 2650 m, upland evergreen bushland (*Erica arborea* zone). 1458 (C, ETH, K). – S of Sheki, 2600 m, upland evergreen bushland. 1637 (BR, C, ETH, K). – Bonga, 1700 m, 'coffee forest'. 2138 (BR, C, ETH, K, WAG).

Illubabor: S of Gore, 1700 m, upland rain forest. 1858 (BR, C, ETH, K). – E of Yaiyo, 1500 m, upland rain forest. 2022 (BR, C, ETH, K).

New to Shoa, Kaffa and Illubabor. – Our specimens nos. 1458 and 1637 approach *Ardisiandra wettsteinii* R. Wagner in having faintly developed cartilaginous apex on the capsules.

#### Sapotaceae (K. Vollesen)

*Malacantha alnifolia* (J. Baker) Pierre 1891

Hemsley 1961: 286 & 1968: 24.

Kaffa: at Gogeb River, 1250 m, riverine forest. 2345 (C, ETH, K).

New to Kaffa. – Hemsley (1968) records this species from Ethiopia without further locality.

#### Oleaceae (I. Friis)

*Jasminum eminii* Gilg 1895

Lieben 1973: 16; Agnew 1974: 364.

Kaffa: SW of Jimma, 1800 m, upland evergreen bushland. 242 (BR, C, EA, ETH, FI, K, WAG).

New to Kaffa. – Lieben (l.c.) records this species from Ethiopia without further locality.

#### Loganiaceae (I. Friis)

*Strychnos henningsii* Gilg 1893

Cufodontis 1960a: 675; Leeuwenberg 1969: 126.

Syn.: *Strychnos barbata* Chiov. 1932, non A. W. Hill 1909. – Cufodontis 1960a: 674.

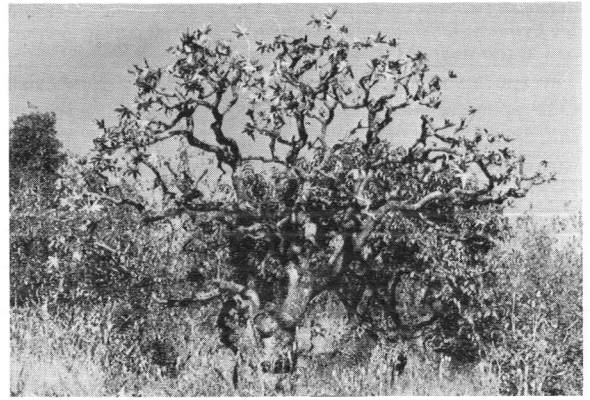


Fig. 21. *Cussonia ostinii* in deciduous wooded grassland on Mt. Maigudo (Kaffa) at 2100 m.

Illubabor: at Baro River, 550 m, riverine forest. 1920 (C, ETH, K).

New to Illubabor.

*Strychnos mitis* S. Moore 1911

Leeuwenberg 1969: 190.

Illubabor: SW of Bure, 1450 m, riverine forest. 1911 (C, ETH, K).

Kaffa: at Gogeb River, 1250 m, riverine forest. 2331 (C, ETH, K).

New to Kaffa. – Leeuwenberg (l.c.) records three collections from N Illubabor.

#### Asclepiadaceae (I. Friis)

*Tacazzea galactogoga* Bullock 1954

Cufodontis 1960a: 693.

Kaffa: Mt. Maigudo, 2650 m, upland evergreen bushland (*Erica arborea* zone). 1453 (BR, C, ETH, K, WAG).

New to Kaffa.

*Periploca linearifolia* A. Rich. & Quart. – Dill. 1840

Cufodontis 1960a: 694 & 1962b: 277.

Kaffa: Mt. Maigudo, 2300 m, upland evergreen bushland. 462 (BR, C, ETH, K, WAG). – E of Bonga, 1600 m, upland evergreen bushland. 2324 (BR, C, ETH, K, WAG).

Illubabor: E of Yaiyo, 1300 m, riverine forest. 1975A (C, ETH, K).

New to Kaffa and Illubabor.

*Stathmostelma pedunculatum* (Decne.) K. Schum. 1893

Cufodontis 1960a: 703 & 1962 b: 279.

Kaffa: Nadda, 1750 m, *Acacia* wooded grassland. 440 (C). – At Gabba River, 1400 m, wooded grassland. 2323 (C, ETH, K).

New to Kaffa.

*Cynanchum falcatum* Hutch. & Bruce 1940

Cufodontis 1960a: 705.

Sidamo: SE of Neghelle, 1300 m, *Acacia-Commiphora* bushland. 942 (C).

New to Sidamo. – The leaves of our specimen is broader

than those of the type (Gillett 4114, K, from N Somalia).

See note under the following species.

*Cynanchum hastifolium* Hochst. ex K. Schum. 1895

Cufodontis 1960a: 705.

Sidamo: W of Filtu, 1250 m, *Acacia-Commiphora* bushland. 1018 (C, ETH, K).

New to Sidamo. – Our specimens have somewhat abnormal leaves and do not agree with those of specimens from other parts of Ethiopia. Similar aberrant leaves are seen on the specimen Gillett 4952 (K) from N Somalia. As the distinction between *Cynanchum falcatum* Hutch. & Bruce and *Cynanchum hastifolium* Hochst. ex K. Schum. seems mainly to rest on the leaf-shape the occurrence of such aberrant leaves causes doubt about the validity of the two taxa as distinct species.

*Ceropegia abyssinica* Decne. 1844

Cufodontis 1961: 710.

Sidamo: S of Waddere, 1600 m, bushland with *Cussonia holstii* and *Tarchonanthus camphoratus* (Fig. 22). 836 (C).

New to Sidamo (Fig. 22).

#### Convolvulaceae (I. Friis)

*Cuscuta campestris* Yuncker 1932

Verdcourt 1963: 5.

Kaffa: Aro, 1700–1800 m, 'coffee forest'. 146 (BR, C, ETH, K, WAG). – Jimma, 1700 m, garden. 2045 (BR, C, ETH, K, WAG).

New to Ethiopia.

*Dichondra repens* J. & G. Forster 1776

Cufodontis 1961: 729.

Shoa: Entoto Hill, 2650 m, upland evergreen bushland. 1383 (C).

New to Shoa.

*Cladostigma dioicum* Radlk. 1883

Cufodontis 1961: 732.

Sidamo: SE of Neghelle, 1300 m, *Acacia-Commiphora* bushland. 937 (C, ETH, K).

New to Sidamo.

*Lepistemon owariense* (P.-Beauv.) H. Hallier 1903

Verdcourt 1963: 63.

Kaffa: at Gogeb River, 1400 m, wooded grassland. 2317 (BR, C, ETH, K, WAG).

New to Ethiopia.

*Stictocardia beraviensis* H. Hallier 1893

Verdcourt 1963: 69.

Illubabor: at Gabba River, 1200 m, riverine forest. 1758 (C, ETH, K).

New to Illubabor. – Verdcourt (l.c.) records this species for Ethiopia without further locality.

#### Boraginaceae (I. Friis)

*Heliotropium baclei* DC 1845 var. *rostratum* Johnston 1930

Cufodontis 1961: 772 (without indication of variety); Taton 1971: 35.

Kaffa: Kochi, 1690 m, upland grassland. 2072 (BR, C, ETH, K, WAG).

New to Kaffa. – Cufodontis (l.c.) records this species for Ethiopia without indication of province.

*Heliotropium indicum* L. 1753

Cufodontis 1962a: 774; Taton 1971: 30.

Kaffa: Kochi, 1690 m, upland grassland. 2073 (BR, C, ETH, K, WAG).

New to Kaffa.

*Heliotropium simile* Vatke 1880–82

Vatke 1880–82: 317.

Sidamo: SE of Neghelle, 1400 m, grassland. 867 (C, ETH, K).

New to Ethiopia. – Vatke (l.c.) based this species on material collected at Ukamba on the sloping planes E of the central Kenyan highland. The original material at B seems now to be lost. Our material, however, fits Vatke's description and matches material collected near the type locality.

#### Labiatae (K. Vollesen)

*Achyrospermum parviflorum* S. Moore 1907

Agnew 1974: 624.

Illubabor: E of Yaiyo, 1450 m, 'coffee forest'. 1977 (BR, C, ETH, K).

New to Ethiopia.

*Leucas aequistylosa* Sebald 1977

Sebald 1977: 2.

Kaffa: Jimma, 1700 m, roadside. 2025 (BR, C, ETH, K).

Our collection represents the second record of this species.

*Leucas deflexa* J. D. Hook. 1864

Cufodontis 1962a: 809.

Kaffa: S of Sheki, 2600 m, upland evergreen bushland. 1616 (BR, C, ETH, K, WAG).

Illubabor: S of Gore, 1700 m, clearing in upland evergreen forest. 1856 (BR, C, ETH, K).

New to Kaffa and Illubabor.

*Satureja pseudosimensis* Brenan 1954

Cufodontis 1962a: 822; Sebald 1972: 16; Hedberg 1962: 431 & 1971: 115.

Shoa: Bole Gorge, 2300 m, grassland. 1157 (C). – Ankober, 2700 m, upland evergreen bushland (derived from *Juniperus procera* forest). 1332 (C, K). – E of Debre Berhan, 3300 m, upland evergreen bushland (*Erica arborea* zone). 1372 (C, ETH, K).

New to Shoa.



Fig. 22. *Ceropogia abyssinica* in bushland between Waddera and Neghelle (Sidamo) at 1600 m.

*Plectranthus cylindraceus* Benth. 1848

Cufodontis 1963: 833.

Sidamo: SE of Neghelle, 1250 m, *Acacia-Commiphora* bushland. 994 (C, ETH, K). – At Genale Doria, 1100 m, dry deciduous bushland. 1037 (C, ETH, K).

New to Sidamo.

*Plectranthus glandulosus* J. D. Hook. 1861

Morton 1963: 460.

Illubabor: S of Gore, 1750 m, upland rain forest. 1085 (C, ETH, K). – E. of Yaiyo, 1300 m, riverine forest. 1951 (C, ETH, K). – Ibidem, 1500 m, upland rain forest, clearing. 2014 (BR, C, ETH, K).

New to Ethiopia.

*Isodon ramosissimus* (J. D. Hook.) Codd 1968

Codd 1968: 239.

Syn.: *Homalocheilos ramosissimus* (J. D. Hook.) J. K. Morton 1962. – Morton 1963: 460; Agnew 1974: 642. – *Plectranthus ramosissimus* J. D. Hook. 1862. – Robyns 1947: 169; Andrews 1956: 223.

Syn. nov.: *Plectranthus schimperi* Vatke 1871–73. – Cufodontis 1963: 838.

Kaffa: Mt. Maigudo, 2650 m, upland evergreen bushland (*Erica arborea* zone). 1437 (BR, C, ETH, K, WAG). – S of Sheki, 2600 m, upland grassland. 1618 (C, ETH, K). – Bonga, 1700 m, upland rain forest, clearing. 2085 (BR, C, ETH, K, WAG).

The type specimens of *Plectranthus ramosissimus* J. D. Hook (Mann 1320, K). and of *Plectranthus schimperi* Vatke (Schimper 1174, 1179, K, isosyntypes, original syntypes probably destroyed) have been studied and found to be conspecific.

Chiovenda (1937: 517) described a *Plectranthus schimperi* but it is not certain whether he intended to describe it as a new species, see Cufodontis (1963: 838).

*Plectranthus sylvestris* Gürke 1894

Robyns 1947: 170; Agnew 1974: 636.

Illubabor: S of Gore, 1750 m, upland rain forest, at small stream. 1835 (BR, C, ETH).

Kaffa: N of Bonga, 1750 m, upland rain forest. 2241 (C, ETH, K).

New to Ethiopia.

*Coleus autranii* Briq. 1894

Cufodontis 1963: 831.

Sidamo: S of Agere Selam, 2650 m, upland rain forest (*Hagenia abyssinica* zone). 746 (C, ETH, K).

Kaffa: Mt. Maigudo, 2700 m, upland evergreen bushland. 1405 (BR, C, ETH, K).

This species is certainly a *Solenostemum* but there is no combination available in that genus. It is very near the variable – and perhaps heterogenous – *Solenostemon latifolius* (Benth.) J. K. Morton.

*Haumaniastrum cylindraceum* (Oliv.) Cuf. 1963

Cufodontis 1963: 843.

Illubabor: E of Metu, 1630 m, 'coffee forest'. 1708 (BR, C, ETH, FI, K, WAG).

New to Illubabor. – Cufodontis (l.c.) records only one previous Ethiopian collection (Mooney 8472, K, from Harar).

*Ocimum spicatum* Defl. 1896

Cufodontis 1963: 848.

Sidamo: SE of Neghelle, 1600 m, *Acacia-Commiphora* bushland. 893 (BR, C, ETH, K).

New to Ethiopia.

*Becium ellenbeckii* (Gürke) Cuf. 1963

Cufodontis 1963: 849.

Sidamo: SE of Neghelle, 1300 m, *Acacia-Commiphora* bushland. 930 (BR, C, ETH, K, WAG).

This species is presumably endemic to Ethiopia, and has hitherto been known only from the type collection (Ellenbeck 2008, B, from Harar). This specimen is now lost, and the identification of our material rests on a comparison with the original description and a figure.

*Iboza riparia* (Hochst) N. E. Brown 1910 (det. I. Friis)

Cufodontis 1963: 845.

Syn.: *Iboza multiflora* (Benth.) E. A. Bruce 1940. – Agnew 1974: 642.

Kaffa: SE of Folla, 2000 m, upland evergreen bushland. 541 (C, K).

New to Kaffa. – Agnew (l.c.) apparently regards *Iboza riparia* (Hochst.) N. E. Brown as a synonym of *Iboza multiflora* (Benth.) E. A. Bruce, at least to judge from



the index to species – nothing is mentioned in the text. However, the basionym of *Iboza riparia* (*Moschosma riparia* Hochst. 1845) antedates the basionym of *Iboza multiflora* (*Moschosma multiflora* Benth. 1848) and the synonymy should therefore be as stated above.

#### **Solanaceae** (I. Friis)

*Lycium europaeum* L. 1753

Dale & Greenway 1961: 537.

Syn.: *Lycium persicum* Miers 1854. – Cufodontis 1963: 855.

Sidamo: S of Waddere, 1600 m, bushland with *Cussonia holstii* and *Tarchonanthus camphoratus*. 853 (C, ETH, K).

*Lycium europaeum* L. is not previously recorded from Sidamo. However, Lanza (1939: 202–204) described two new species of *Lycium*, *Lycium cufodontii* Lanza and *Lycium javellense* Lanza, from localities in S Sidamo. The two new species were founded on small differences in the indumentum of the interior of the corolla tube and the filaments, and might if a broad species concept in the genus *Lycium* is accepted – be considered conspecific with *Lycium europaeum* L.

*Discopodium penninervium* Hochst. 1844

Cufodontis 1963: 856 & 1965b: 89 & 1965c: 115.

Kaffa: Mt. Maigudo, 2700 m, upland evergreen bushland. 1411 (BR, C, ETH, K).

New to Kaffa.

*Physalis minima* L. 1753

Cufodontis 1963: 858.

Illubabor: E of Metu, 1600 m, roadside at village. 1699 (C, ETH, K). – E of Yaiyo, 1600 m, roadside. 1995 (BR, C, ETH, K).

Kaffa: N of Bonga, 1750 m, upland rain forest, clearing. 2235 (C).

New to Kaffa and Illubabor.

*Solanum aculeatissimum* Jacq. 1781

Andrews 1956: 102; Agnew 1974: 528.

Kaffa: W of Bonga, 1950 m, upland rain forest, clearing. 2247 (BR, C, ETH, K).

New to Ethiopia.

#### **Scrophulariaceae** (I. Friis)

*Celsia pedunculosa* Benth. 1846

Cufodontis 1963: 886.

Shoa: Awash River at Koka Dam, 1600 m, *Commiphora* bushland. 707 (C, ETH, K).

New to Shoa.

*Diclis bambuseti* R. E. Fries 1925

Agnew 1974: 551.

Kaffa: S of Sheki, 2600 m, upland grassland. 1639 (C, ETH, K).

New to Ethiopia. – The spur in our material is nearly twice as long as described by Fries. The same has been observed in a specimen from Uganda (A.S. Thomas 2639, K).

*Diclis ovata* Benth. 1836

Cufodontis 1963: 888.

Kaffa: Belleta Forest, 2000 m, upland rain forest clearing. 274 (BR, C, ETH, K).

New to Kaffa.

*Kickxia elatine* (L.) Dum. 1827

Cufodontis 1963: 889.

Kaffa: Jimma, 1700 m, garden. 2036 (BR, C, ETH, K, WAG).

New to Kaffa.

*Craterostigma plantagineum* Hochst. 1841

Cufodontis 1963: 896; Sebald 1972: 22.

Sidamo: at Genale Doria, 1100 m, dry scrub. 1040 (C).

New to Sidamo.

*Lindernia oliveriana* Dandy 1956

Cufodontis 1963: 897.

Kaffa: Kochi, 1700 m, upland grassland with oozing water. 612 (BR, C, ETH, K), 2062 (BR, C, ETH, K).

New to Kaffa.

#### **Gesneriaceae** (I. Friis)

*Streptocarpus phaeotrichus* Chiov. ex B. L. Burt 1960

Cufodontis 1963: 922; Hilliard & Burt 1971: 242 & Fig. 11.

Kaffa: Bonga, 1900 m, upland rain forest, in spray from waterfall. 299 (C).

This endemic species of *Streptocarpus* is now known from three localities: Ghidami in Wollega, and Mezan Tefari and Bonga in Kaffa.

#### **Lentibulariaceae** (I. Friis & P. Taylor)

*Utricularia prehensilis* E. Mey. 1837

Cufodontis 1963: 924.

Kaffa: Kochi, 1700 m, upland grassland with oozing water (Fig. 23). 69 (BR, C, ETH, K, WAG). 2065 (C, ETH, K).

New to Kaffa (Fig. 23).

*Utricularia reflexa* Oliv. 1865

Taylor 1973: 17.

Sidamo: N of Kebre Mengist, 2100 m, upland rain forest, small pond in clearing. 1082 (C, ETH, K).

New to Ethiopia.

#### **Acanthaceae** (I. Friis)

*Nelsonia canescens* (Lam.) Spreng. 1825

Cufodontis 1964: 926.

Illubabor: E of Yaiyo, 1300 m, riverine forest. 1942 (BR, C, ETH, K).

New to Illubabor.

*Brillantaisia madagascariensis* Lindau 1893

Cufodontis 1964: 930; Heine 1963: 406.

Illubabor: S of Gore, 1750 m, upland rain forest. 1882 (BR, C, ETH, K). – SW of Bure, 1450 m, riverine forest. 1908 (BR, C, ETH, K).

New to Illubabor. – The relation between this species and the closely related *Brillantaisia grottanellii* Pic.-Serm. 1951, (Pichi-Sermolli 1951: 254) based on the specimen Pichi-Sermolli 2099, FI, from the Forest of Tucur Dinghia in Beghemder, is not quite clear. A decision requires a revision of the widespread and variable *Brillantaisia madagascariensis* Lindau.

*Hygrophila auriculata* (Schumach.) Heine 1962

Cufodontis 1964: 931; Sebald 1972: 27.

Illubabor: E of Metu, 1630 m, 'coffee forest'. 1707 (BR, C, ETH, K).

New to Illubabor.

*Hygrophila pobeginii* Benoist 1913

Heine 1963: 396; Napper & Agnew 1974: 583.

Kaffa: Kochi, 1700 m, upland grassland, swamp. 48 (BR, C, ETH, F, K, WAG), 2050 (C, ETH, K).

New to Ethiopia.

*Eremomastax speciosa* (Hochst.) Cuf. 1964

Cufodontis 1964: 931.

Syn.: *Paulo-Wilhelmia speciosa* Hochst. 1844. – Robyns 1947: 276.

Illubabor: SW of Bure, 1450 m, riverine forest. 1905 (C, ETH, K).

New to Illubabor. – Probably the first collection of this species from Ethiopia since Schimper's type collection (1837–44). A closely related species, *Eremomastax polysperma* (Benth.) Dandy, based on *Paulo-Wilhelmia polysperma* Benth. 1849, is widespread in W Africa, and may not be specifically distinct from *Eremomastax speciosa* (Hochst.) Cuf.

*Mimulopsis solmsii* Schweinf. 1868

Cufodontis 1964: 932; Sebald 1972: 27.

Kaffa: Mt. Maigudo, 2700 m, upland evergreen bushland. 1402 (BR, C, ETH, K, WAG). – W of Bonga, 1950 m, upland rain forest. 2248 (BR, C, ETH, K, WAG).

New to Kaffa.

*Dyschoriste fruticulosa* (Rolfe) Chiov. 1929

Cufodontis 1964: 934.

Sidamo: S of Waddere, 1600 m, bushland with *Cussonia holstii* and *Tarchonanthus camphoratus*. 804 (BR, C, ETH, K).

New to Sidamo.

*Dyschoriste perrottetii* (Nees) O. Kuntze 1891

Cufodontis 1964: 934.

Illubabor: at Gabba River, 1200 m, riverine forest. 1730 (BR, C, ETH, K). – E of Yaio, 1300 m, riverine forest. 1962 (C, ETH, K).

New to Illubabor.

*Satanocrater paradoxa* (Lindau) Lindau 1897

Turrill 1913: Tab. 2982.

Syn.: *Satanocrater somalensis* auct., non (Lindau) Lindau: Clarke 1899: 69; Cufodontis 1964: 936.

Sidamo: W of Filtu, 1250 m, *Acacia-Commiphora* bushland. 1006 (BR, C, ETH, K, WAG).



Fig. 23. *Utricularia prehensilis* in seepage meadow at Kochi E of Jimma (Kaffa) at 1690 m.

Clarke (l.c.) reduced *Satanocrater paradoxa* to a synonym of *Satanocrater somalensis*. The two species are, however, completely unlike. The corolla of *Satanocrater paradoxa* is scarlet with a black centre and one of the corolla lobes is reduced to a hook-shaped structure for which reason the corolla is very markedly zygomorphic. The corolla of *Satanocrater somalensis* is pale blue and almost regular.

The reason for the above mentioned misidentification must be found in the fact that *Satanocrater paradoxa* has been very rarely collected. The type specimen (Riva 420 from Dschacorsa, S Sidamo, FI) was for some time the only known material of this species and was not studied by Clarke. The species was collected by Drake-Brockman in 'Boran' (C Sidamo, exact locality unknown, K) and illustrated (Turrill l.c.). Our material is the third gathering of this species.

*Blepharis maderaspatensis* (L.) Roth. 1821

Cufodontis 1964: 952; Sebald 1972: 30.

Shoa: Bole Gorge, 1650 m, riverine forest. 1129 (C, ETH, K).

Illubabor: at Baro River, 550 m, riverine forest. 1917 (C, ETH, K).

New to Shoa and Illubabor.

*Asystasia gangetica* (L.) T. Anders. 1860

Cufodontis 1964: 956.

Illubabor: E of Metu, 1630 m, 'coffee forest'. 1706 (BR, C, ETH, K).

New to Illubabor.

*Dicliptera laxata* C. B. Clarke 1900

Cufodontis 1964: 959.

Kaffa: N of Bonga, 1750 m, upland rain forest. 2228 (BR, C, ETH, K, WAG).

New to Kaffa.

#### Rubiaceae (I. Friis)

*Oldenlandia corymbosa* L. 1753 var. *caespitosa* (Benth.) Verdc. 1975 (det. B. Verdcourt)

Cufodontis 1965a: 983 (as *Oldenlandia corymbosa* L.); Verdcourt 1976: 310.

Kaffa: N of Sheki 2000 m, weed in field. 201 (C). – At Gogeb River, 1400 m, wooded grassland. 2285 (BR, C, ETH, K, WAG).

New to Kaffa.

*Oldenlandia goreensis* (DC.) Summerh. 1928 (det. B. Verdcourt)

Cufodontis 1965a: 984; Verdcourt 1976: 279.

Sidamo: N of Kebre Mengist, 2100 m, upland rain forest, clearing. 1085 (BR, C, ETH, K, WAG).

Illubabor: S of Gore, 1750 m, upland rain forest, on moist rocks. 1813 (BR, C, ETH, K, WAG).

New to Sidamo and Illubabor.

*Oldenlandia lancifolia* (Schumach.) DC. 1830 (det. B. Verdcourt)

Cufodontis 1965a: 985; Verdcourt 1976: 292.

Illubabor: S of Gore, 1750 m, upland rain forest, on moist rocks. 1813B (C). – Ibidem, 1700 m, upland rain forest, at small stream. 1868 (BR, C, ETH, K).

Kaffa: W of Bonga, 1950 m, upland rain forest, swamp. 2169 (BR, C, ETH, K).

New to Illubabor and Kaffa.

*Oldenlandia monanthos* (A. Rich.) Hiern 1877 (det. B. Verdcourt)

Cufodontis 1965a: 985; Verdcourt 1976: 281.

Kaffa: Belleta Forest, 2000 m, upland rain forest. 276 (BR, C, ETH, K, WAG). – Mt. Maigudo, 2350 m, upland evergreen bushland. 515 (C).

New to Kaffa.

*Hymenodictyon floribundum* (Hochst. & Steud.) B. L. Robinson 1910

Cufodontis 1965a: 997; Sebald 1972: 32.

Illubabor: at Gabba River, 1200 m, riverine forest. 1723 (C, ETH, K).

New to Illubabor.

*Mitragyna rubrostipulata* (K. Schum.) Havil. 1897 (det. I. Friis & B. Verdcourt)

Syn.: *Mitragyna stipulosa* sensu auct., non (DC.) O. Kuntze: Cufodontis 1965a: 998.

Illubabor: S of Gore, 1750 m, upland rain forest. 1781 (C, ETH, K).

Cufodontis (l.c.) cites two specimens of *Mitragyna* from Ethiopia, both referred to the lowland species *Mitragyna stipulosa*. Both these specimens and our material are, however, clearly the Afromontane species *Mitragyna rubrostipulata*.

*Rothmannia urcelliformis* (Hiern) Robyns 1947

Cufodontis 1965a: 1003 & 1965b: 99.

Shoa: Bole Gorge, 1750 m, riverine forest. 1139 (BR, C, ETH, K).

New to Shoa.

*Psychotria orophila* Petit 1964

Petit 1964: 92; Cufodontis 1965a: 1019; Petit 1972a: 356 & 1972b: 118; Verdcourt 1976: 49.

Syn. nov.: *Psychotria sidamensis* Cuf. 1965.

Cufodontis 1965b: 101 & fig.

Sidamo: N of Kebre Mengist, 2100 m, upland rain forest. 1047 (BR, C, ETH, K).

Kaffa: Belleta Forest, 2000 m, upland rain forest. 261 (BR, C, ETH, K, WAG). – Bonga, 1950 m, upland rain forest. 414 (C). – Ibidem, 1900 m, 2157 (BR, C, ETH, K, WAG).

Illubabor: S of Gore, 1750 m, upland rain forest. 1771 (BR, C, ETH, K).

New to Kaffa and Illubabor. – *Psychotria orophila* is, as shown on the map published by Petit (1972b), an Afromontane species occurring in E Zaire, Kenya, Uganda, Tanzania and Ethiopia. It was described by Petit (1964) from E Zaire almost at the same time as Cufodontis described *Psychotria sidamensis*. Our material has been compared with Cufodontis' type specimen (Haberland 2057, from Sidamo, FR) and with material from Zaire, E Africa and Ethiopia named as *Psychotria orophila* by Petit and Verdcourt. The comparison shows that Haberland 2057 agrees well with material from the entire distribution area of *Psychotria orophila*, and *Psychotria sidamensis* is therefore reduced to a synonym.

*Psychotria peduncularis* (Salisb.) Steyerl. 1972 var. *ciliato-stipulata* (De Wild.) Verdc. 1976 (det. I. Friis & B. Verdcourt)

Verdcourt 1976: 74.

Syn.: *Cephaelis ciliato-stipulata* De Wild. – Cufodontis 1965a: 1019 (as *Cephaelis* sp. aff. *ciliato-stipulata*).

Illubabor: E of Yaiyo, 1500 m, upland rain forest. 2004 (C, ETH, K).

Kaffa: N of Bonga, 1750 m, upland rain forest. 2238 (C). New to Illubabor. – The specimen cited by Cufodontis (l.c.), Meyer 7851, K, from Kaffa, is the first Ethiopian record of this W African rain forest species.

*Anthospermum pacchyrrhizum* Hiern 1877

Cufodontis 1965a: 1020; Wickens 1976: 129 & Map 110.

Shoa: Bole Gorge, 1900 m, upland evergreen bushland. 1156 (BR, C, ETH, K).

New to Shoa. – This is the southernmost record of this species which is endemic to N Ethiopia and Jebel Marra in the Sudan (Wickens l.c.).

*Spermacoce princeae* (K. Schum.) Verdc. 1975 (det. B. Verdcourt)

Verdcourt 1976: 362.

Syn.: *Boreria princeae* K. Schum. 1904. – Cufodontis 1965a: 1022.

Kaffa: W of Bonga, 2000 m, upland rain forest. 339 (BR, C, ETH, K, WAG).

Illubabor: S of Gore, 1750 m, upland rain forest. 1843 (BR, C, ETH, K).

New to Kaffa and Illubabor.

*Galium thunbergianum* Eckl. & Zeyh. 1837 var. *thunbergianum* (det. B. Verdcourt)

Cufodontis 1965a: 1026; Sebald 1972: 35; Verdcourt 1976: 387.

Shoa: W of Ankober, 3050 m, upland evergreen bushland (*Erica arborea* zone).

New to Shoa.

### Cucurbitaceae (C. Jeffrey)

*Oreosyce africana* J. D. Hook. 1871

Jeffrey 1967b: 110.

Syn.: *Oreosyce subsericea* (J. D. Hook.) Meeuse 1962. – Cufodontis 1965a: 1031.

Kaffa: Aro, 1700–1800 m, 'coffee forest'. 136 (BR, C, ETH, K, WAG).

New to Kaffa.

*Zehneria minutiflora* (Cogn.) Jeffrey 1962

Jeffrey 1967b: 126.

Illubabor: S of Gore, 1700 m, upland rain forest. 1860 (C, ETH, K).

Kaffa: Bonga, 1700 m, upland rain forest. 2106 (C).

New to Illubabor and Kaffa. – Jeffrey (l.c.) records this species for Ethiopia.

*Zehneria scabra* (L.f.) Sond. 1862

Cufodontis 1965a: 1031.

Illubabor: at Gabba River, 1200 m, upland rain forest, edge. 1743 (C, ETH, K).

New to Illubabor.

*Mukia maderaspatana* (L.) Roemer 1846

Cufodontis 1965a: 1032; Sebald 1972: 37.

Illubabor: E of Metu, 1630 m, 'coffee forest', edge. 1702 (BR, C, ETH, K).

Kaffa: E of Bonga, 1500 m, wooded grassland. 2275 (BR, C, ETH, K, WAG).

New to Illubabor and Kaffa.

*Cucumella engleri* (Gilg) C. Jeffrey 1962

Jeffrey 1967b: 113.

Sidamo: SE of Neghelle, 1600 m, *Acacia-Commiphora* bushland. 883 (C, ETH, K).

New to Ethiopia.

*Trochomeria macrocarpa* (Sond.) J. D. Hook. 1871 ssp. *macrocarpa*

Jeffrey 1967b: 87.

Syn.: *Trochomeria djurensis* Gilg 1904. – Andrews 1950: 183.

Sidamo: S of Waddere, 1600 m, 841 (C).

New to Sidamo. – Jeffrey (l.c.) records this species for Ethiopia.

*Peponium vogelii* (J. D. Hook.) Engl. 1897

Cufodontis 1965a: 1047.

Illubabor: S of Gore, 1750 m, upland rain forest. 1838 (C, ETH, K).

New to Illubabor.

*Coccinia adoensis* (A. Rich.) Cogn. 1881

Cufodontis 1965a: 1049.

Kaffa: E of Bonga, 1500 m, wooded grassland. 2276 (C, ETH, K).

New to Kaffa.

*Sicyos polyacanthus* Cogn. 1898

Jeffrey 1967b: 78.

Syn.: *Sicyos australis* auct., non Endl.: Cufodontis 1965a: 1051; Sebald 1972: 37.

Illubabor: at Gabba River, 1200 m, riverine forest. 1745 (BR, C, ETH, K). – E of Yaiyo, 1300 m, riverine forest. 1957 (BR, C, ETH, K).

New to Illubabor.

*Cephalopentandra ecirrhosa* (Cogn.) C. Jeffrey 1964

Jeffrey 1967b: 85.

Syn.: *Coccinia ecirrhosa* Cogn. 1896. – Cufodontis 1965a: 1050.

Sidamo: W of Filtu, 1250 m, *Acacia-Commiphora* bushland. 995 (C, ETH, K).

New to Sidamo.

### Campanulaceae (I. Friis)

*Lobelia giberroa* Hemsl. 1877

Cufodontis 1965a: 1057.

Illubabor: S of Gore, 1750 m, upland rain forest. 1808 (BR, C, ETH, K). – E of Yaiyo, 1500 m, 'coffee forest'. 2016 (C).

New to Illubabor.

*Lobelia welwitschii* Engl. & Diels 1898

Agnew 1974: 517.

Kaffa: Kochi, 1700 m, upland grassland with oozing water. 46 (BR, C, ETH, K, WAG). – 2054 (C, ETH, K).

New to Ethiopia.

### Compositae (I. Friis)

*Erlangea schimperi* (Oliv. & Hiern.) S. Moore 1902

Cufodontis 1966a: 1064 & 1966c: 273.

Kaffa: Mt. Maigudo, 2650 m, upland evergreen bushland 1488 (BR, C, ETH, K, WAG). – N of Sheki, 2600 m, upland grassland. 1625 (BR, C, ETH, K, WAG).

New to Kaffa.

*Vernonia auriculifera* Hiern 1898

Cufodontis 1966a: 1067 & 1966b: 251.

Kaffa: Bonga, 1700 m, upland rain forest, forest edge. 2083 (BR, C, ETH, K, WAG).

New to Kaffa.

*Vernonia inulifolia* Schultz-Bip. 1843

Cufodontis 1966a: 1072 & 1968b: 2.

Kaffa: at Gogeb River, 1400 m, edge of riverine forest. 2308 (BR, C, ETH, K). – Ibidem, 1250 m, wooded grassland. 2353 (C, ETH, K).

New to Kaffa.

*Vernonia jugalis* Oliv. & Hiern 1877

Cufodontis 1966a: 1072.

Illubabor: at Gabba River, 1200 m, riverine forest. 1719 (C, ETH, K).

New to Illubabor.

*Vernonia rueppellii* Schultz-Bip. 1843

Cufodontis 1966a: 1075 & 1966b: 252.

Kaffa: Mt. Maigudo, 2700 m, upland evergreen bushland. 1408 (BR, C, ETH, K, WAG).

New to Kaffa.

*Vernonia smithiana* (DC.) Lessing 1831

Cufodontis 1966a: 1075.

Kaffa: at Gogeb River, 1400 m, wooded grassland. 2293 (C).

New to Kaffa.

*Vernonia urticifolia* A. Rich. 1847

Cufodontis 1966a: 1077.

Kaffa: N of Sheki, 2600 m, upland evergreen bushland. 1611 (BR, C, ETH, K, WAG). – Bonga, 1700 m, upland rain forest. 2084 (BR, C, ETH, K).

New to Kaffa.

*Vernonia vernonioides* (Schultz.-Bip.) Cuf. 1966

Cufodontis 1966a: 1078.

Syn.: *Linzia vernonioides* Schultz-Bip. 1843. – *Vernonia quartiniana* A. Rich. 1847, nom. illeg.

Kaffa: Nadda, 1800–1900 m, grassland with scattered upland evergreen bushland. 436 (BR, C, ETH, FI, K, WAG).

New to Kaffa. – The most frequently used name for this species, *Vernonia quartiniana*, is illegitimate because Richard (1847: 379) includes *Linzia vernonioides* Schults-Bip. in the protologue as a synonym.

*Adenostemma mauritianum* DC. 1836

Cufodontis 1966a: 1079.

Kaffa: Belleta Forest, 2000 m, upland rain forest, at path. 221 (BR, C, ETH, K, WAG). – Bonga, 1700 m, upland rain forest, at path. 2086 (BR, C, ETH, K).

New to Kaffa.

*Adenostemma perrottetii* DC. 1836

Cufodontis 1966a: 1079.

Illubabor: S of Gore, 1750 m, upland rain forest clearing. 1790 (C).

New to Illubabor.

*Stomathanthes meyeri* King & Robins. 1975

King & Robinson 1975: 463.

Kaffa: Mt. Maigudo, 2400 m, upland evergreen bushland (*Erica arborea* zone). 1518 (BR, C, ETH, K, WAG).

The second record of this species.

*Mikania cordata* (N. L. Burm.) B. L. Robins. 1934

Cufodontis 1966a: 1080.

Illubabor: S of Gore, 1750 m, upland rain forest, at path. 1798 (C, ETH, K).

New to Illubabor.

*Blumea bovei* (DC.) Vatke 1875

Cufodontis 1966a: 1092.

Shoa: at Awash River, 1600 m, dry riparian scrub. 713 (C, ETH, K).

New to Shoa.

*Laggera elatior* R. E. Fries 1928

Andrews 1956: 40; Agnew 1974: 443.

Kaffa: Mt. Maigudo, 2550 m, upland evergreen bushland. 1496 (C, ETH, K).

New to Ethiopia.

*Laggera pterodonta* (DC.) Schultz-Bip. 1867

Cufodontis 1966a: 1095.

Kaffa: Mt. Maigudo, 2650 m, upland evergreen bushland. 1448 (BR, C, ETH, K, WAG).

New to Kaffa.

*Pluchea ovalis* (Pers.) DC. 1836

Cufodontis 1966a: 1097.

Shoa: at Awash River, 1600 m, dry riparian scrub. 714 (BR, C, ETH, K).

New to Shoa.

*Sphaeranthus suaveolens* (Forssk.) DC. 1836

Cufodontis 1966a: 1101.

Illubabor: S of Gore, 1750 m, upland rain forest, at small stream. 1827 (BR, C, ETH, K, WAG). – E of Yaiyo, 1500 m, upland rain forest, clearing. 2003 (C, ETH, K).

New to Illubabor.

*Blepharispermum fruticosum* Klatt 1895

Cufodontis 1966a: 1102.

Sidamo: E of Neghelle, 1250 m, *Acacia-Commiphora* bushland (Fig. 24). 1002 (C, ETH, K).

New to Sidamo (Fig. 24).

*Helichrysum foetidum* (L.) Moench 1794

Cufodontis 1966a: 1109 & 1968b: 4.

Shoa: Entoto Hill, 2700 m, *Eucalyptus* plantation. 1189 (C, ETH, K).

New to Shoa.

*Helichrysum globosum* A. Rich. 1847

Agnew 1974: 452.

Syn.: *Gnaphalium schulzii* Mendonca 1943. – Cufodontis 1966a: 1107 & 1966b: 253; Hedberg 1971: 118. – *Gnaphalium globosum* Schultz-Bip. 1845, nom. illeg., non Hornem. 1813–15, nec Desf. 1829.

Kaffa: E of Bonga, 1500 m, wooded grassland. 2277 (C, K).

New to Kaffa.

*Helichrysum guilelmii* Engl. 1892

Cufodontis 1966a: 1112; Hedberg 1971: 118.

Kaffa: Mt. Maigudo, 2700 m, upland evergreen bushland. 1426 (C).  
New to Kaffa.

*Sigesbeckia abyssinica* (Schults-Bip.) Oliv. & Hiern 1877

Cufodontis 1967: 1126.

Illubabor: S of Gore, 1750 m, upland rain forest. 1800 (C, ETH, K).

New to Illubabor.

*Guizotia arborescens* I. Friis 1971

Friis 1971: 23; Baagøe 1974: 22.

Illubabor: at Didessa River, 1950 m, upland evergreen bushland. 2024 (BR, C, ETH, K).

New to Illubabor.

*Bidens imatongensis* Scherff 1939

Andrews 1956: 13.

Kaffa: Mt. Maigudo, 2300 m, upland evergreen bushland. 505 (BR, C, ETH, K), 1534 (BR, C, ETH, K, WAG).

New to Ethiopia. – Hitherto only known from the Imatong Mts. in S Sudan and N Uganda.

*Bidens prestinariaeformis* (Vatke) Cuf. var. *incisa* (Scherff) Cuf. 1967

Cufodontis 1967: 1140 & 1968b: 5.

Kaffa: Bonga, 1800 m, weed in *Sorghum* field. 388 (BR, C, ETH, K, WAG).

New to Kaffa.

*Bidens schimperii* Schultz-Bip. 1846

Cufodontis 1967: 1141.

Kaffa: Sheki, 2600 m, upland evergreen bushland. 1612 (BR, C, ETH, K, WAG).

New to Kaffa.

*Galinsoga ciliata* (Raf.) Blake 1922

Agnew 1974: 467.

Illubabor: Metu, at Sor River, 1520 m, weed at a ford. 558 (BR, C, ETH, K, WAG).

New to Ethiopia. – Agnew states that this is a rare and recently introduced weed in Kenya.

*Cotula cryptocephala* A. Rich. 1847

Cufodontis 1967: 1146 & 1968b: 5, & 1970b: 5.

Shoa: E of Debre Berhan, 3300 m, upland evergreen bushland (degraded *Erica arborea* scrub.). 1370 (C, ETH, K).

New to Shoa.

*Crassocephalum crepidioides* (Benth.) S. Moore 1912

Cufodontis 1967: 1149.

Illubabor: E of Metu, 1650 m, 'coffee forest', 1766 (C). – E of Yaiyo, 1300 m, upland rain forest, roadside near river. 1967 (C, ETH, K).

New to Illubabor.

*Crassocephalum montuosum* (S. Moore) Milne-Redh. 1951

Cufodontis 1967: 1150.



Fig. 24. *Blepharispermum fruticosum* in deciduous bushland E of Neghelle (Sidamo) at 1250 m.

Illubabor: at Gabba River, 1200 m, upland rain forest. 1739 (BR, C, ETH, K).

New to Illubabor.

*Crassocephalum picridifolium* (DC.) S. Moore 1912

Cufodontis 1967: 1150.

Kaffa: Kochi, 1740 m, upland grassland with oozing water. 43 (BR, C, ETH, FI, K); 2049 (C, ETH, K). – N of Bonga, 1750 m, upland rain forest swamp. 2222 (BR, C, ETH, K, WAG).

New to Kaffa.

*Crassocephalum rubens* (Jacq.) S. Moore 1912

Cufodontis 1967: 1150 & 1970b: 5.

Kaffa: at Gogeb River, 1400 m, wooded grassland, in swamp. 2305 (BR, C, ETH, K, WAG).

New to Kaffa.

*Crassocephalum mannii* (J. D. Hooker) Milne-Redh. 1951

Cufodontis 1967: 1150.

Kaffa: W of Bonga, 1950 m, upland rain forest. 2174 (BR, C, ETH, K, WAG).

New to Kaffa.

*Senecio discifolius* Oliv. 1873

Cufodontis 1967: 1153; Andrews 1956: 49; Agnew 1974: 478.

Kaffa: E of Bonga, 1500 m, wooded grassland. 2271 (BR, C, ETH, K, WAG).

New to Ethiopia. – This species is very close to *S. belidifolius* A. Rich. (= *S. abyssinicus* A. Rich.) but a final decision must await a taxonomic revision.

*Senecio myriocephalus* Schultz-Bip. ex A. Rich. 1847

Cufodontis 1967: 1156.

Kaffa: Mt. Maigudo, 2550 m, upland evergreen bushland (*Hagenia abyssinica* zone). 1507 (BR, C, ETH, K, WAG).

New to Kaffa.

*Emilia integrifolia* Baker 1895

Agnew 1974: 483.

Kaffa: Kochi, 1740 m, upland grassland, in floating bog of *Leersia hexandra*. 601 (BR, C, ETH, K, WAG), 2061 (BR, C, ETH, K).

New to Ethiopia.

*Mikaniopsis clematoides* (A. Rich.) Milne-Redh. 1956

Cufodontis 1967: 1164.

Kaffa: Mt. Maigudo, 2200 m, upland evergreen bushland. 499 (BR, C, ETH, K, WAG). – Ibidem, 2700 m, 1433 (BR, C, ETH, K, WAG).

New to Kaffa.

*Rhaponticum imatongense* (Phillipson) Soják 1962

Cufodontis 1967: 1176; Jeffrey 1968: 131.

Kaffa: Sheki, 1800 m, wooded grassland with *Protea* and *Ptilostigma*. 1690 (BR, C, ETH, K, WAG).

New to Kaffa. – Apparently a very rare species only known from a few collections in C Ethiopia, S Sudan (the Imatong Mts.) and NE Zaire.

*Piloselloides hirsuta* (Forssk.) C. Jeffrey 1967

Cufodontis 1967: 1180; Jeffrey 1967a: 218.

Kaffa: Mt. Maigudo, 2300 m, moist upland grassland. 501 (C).

New to Kaffa.

*Launaea rariflora* (Oliv. & Hiern.) L. Boulos 1962

(det. C. Jeffrey)

Jeffrey 1966: 464; Cufodontis 1967: 1184.

Kaffa: at Gogeb River, 1400 m, wooded grassland. 2286 (C, ETH, K).

New to Kaffa.

*Sonchus bipontinii* Aschers. 1867 (det. C. Jeffrey)

Jeffrey 1966: 479; Cufodontis 1967: 1186.

Kaffa: Mt. Maigudo, 2650 m, upland evergreen bushland (*Hagenia abyssinica* zone). 1472 (BR, C, ETH, K, WAG).

New to Kaffa.

*Sonchus schweinfurthii* Oliv. & Hiern 1877 (det. C. Jeffrey)

Jeffrey 1966: 479; Cufodontis 1967: 1187.

Kaffa: SE of Folla, 2000 m, upland evergreen bushland. 542 (BR, C, ETH, K, WAG). – Giren, 2000 m, upland evergreen bushland. 1597 (C).

New to Kaffa.

*Lactuca paradoxa* A. Rich. 1847 (det. C. Jeffrey)

Jeffrey 1966: 456; Cufodontis 1967: 1188.

Kaffa: Mt. Maigudo, 2200 m, upland evergreen bushland. 491 (BR, C, ETH, K, WAG). – Ibidem, 2500 m, 1503 (BR, C, ETH, K, WAG).

New to Kaffa.

*Prenanthes subpeltata* Stebbins 1937 (det. C. Jeffrey)

Jeffrey 1966: 434; Cufodontis 1967: 1179.

Kaffa: Bonga, 1700 m, upland rain forest, hanging from rocks near waterfall in deep shade. 2107 (BR, C, ETH, K).

New to Kaffa. – Hitherto known from only one Ethio-

pian record (W Bale) and a few localities in E Zaire and C Kenya (Thika falls), occurring either in the spray from waterfalls or in the mist zone of upland rain forest.

**Angiospermae: Monocotyledones**

**Typhaceae** (I. Friis)

*Typha latifolia* L. 1753

Cufodontis 1968a: 1197.

Kaffa: Kochi, 1700 m, upland grassland, at edge of floating bog. 2080 (C, ETH, K). – W of Bonga, 1900 m, upland rain forest, swamp. 2245 (BR, C, ETH, K, WAG).

New to Kaffa.

**Potamogetonaceae** (I. Friis)

*Potamogeton pusillus* L. 1753

Cufodontis 1968a: 1198.

Shoa: Bole Gorge, 1650 m, in shallow pond. 1138 (BR, C, ETH, K, WAG).

New to Shoa.

*Potamogeton nodosus* Poir. 1816

Cufodontis 1968a: 1197.

Sidamo: N of Kebré Mengist, 2100 m, upland grassland, in shallow pond. 1086 (C, ETH).

New to Sidamo.

*Potamogeton schweinfurthii* Bennett 1901

Cufodontis 1968a: 1199.

Shoa: Bole Gorge, 2300 m, upland grassland, in a small stream. 1160 (BR, C, ETH, K).

New to Shoa.

**Alismataceae** (I. Friis)

*Alisma plantago-aquatica* L. 1753

Cufodontis 1968a: 1203.

Kaffa: N of Bonga, 1750 m, upland rain forest, swamp. 2217 (BR, C, ETH, K, WAG).

New to Kaffa.

**Hydrocharitaceae** (I. Friis)

*Ottelia ulvifolia* (Planch.) Walp. 1852

Cufodontis 1968a: 1206.

Kaffa: Kochi, 1700 m, upland grassland, in permanent pool. 53 (BR, C, ETH, K, WAG).

New to Kaffa.

**Poaceae** (S. Renvoize)

*Poa schimperana* A. Rich. 1851

Cufodontis 1968a: 1208; Clayton 1970: 48; Hedberg 1971: 121.

Sidamo: S of Agere Selam, 2650 m, upland rain forest (*Hagenia abyssinica* zone). 755 (C, ETH, K).

Kaffa: Bonga, 1700 m, upland rain forest, at stream. 2094 (BR, C, ETH, K).

New to Kaffa and Sidamo.

*Festuca abyssinica* A. Rich. 1851

Cufodontis 1968a: 1210; Clayton 1970: 60; Hedberg 1971: 121.

Kaffa: Mt. Maigudo, 2650 m, upland evergreen bushland (*Hagenia abyssinica* zone). 1491 (C, ETH, K).

New to Kaffa.

*Festuca arundinacea* Schreber 1771

Cufodontis 1968a: 1211; Clayton 1970: 58.

Kaffa: Jimma, 1700 m, at small ditch. 2361 (C).

New to Kaffa.

*Bromus pectinatus* Thunb. 1794

Clayton 1970: 68.

Syn.: *Bromus cognatus* auct., non Steud. 1854: Cufodontis (1968a: 1213) quoad synonym. *Bromus adoensis* Steud. 1854.

Kaffa: Mt. Maigudo, 2650 m, upland evergreen bushland (*Hagenia abyssinica* zone). 1437 (BR, C, ETH, K).

New to Kaffa.

*Streblochaeta longiarista* (A. Rich.) Pilg. 1926

Cufodontis 1968a: 1215; Hubbard 1970: 74.

Shoa: Menagesha Forest, 2600 m, upland dry evergreen forest. 1219 (C, ETH, K).

New to Shoa.

*Brachypodium flexum* Nees 1841

Clayton 1970: 71.

Syn.: *Brachypodium diphanum* (Steud.) Cuf. 1968. – Cufodontis 1968a: 1215.

Shoa: Menagesha Forest, 2700 m, upland evergreen bushland (*Erica arborea* zone). 1237 (C, ETH, K).

New to Shoa.

*Avena abyssinica* A. Rich. 1851

Cufodontis 1968a: 1224, 1969b: 236 & 1969c: 281.

Kaffa: Mt. Maigudo, 2650 m, upland evergreen bushland (*Hagenia abyssinica* zone) 1479 (C).

New to Kaffa.

*Agrostis kilimandscharica* Mez 1922

Cufodontis 1968a: 1228; Clayton 1970: 110.

Kaffa: Mt. Maigudo, 2550 m, upland evergreen bushland (*Hagenia abyssinica* zone) 1517 (C).

New to Kaffa. – Indicated as doubtfully occurring in Ethiopia by Cufodontis; recorded without reservations by Clayton (l.c.).

*Agrostis quinqueseta* (Steud.) Hochst. 1855

Cufodontis 1968a: 1229; Clayton 1970: 111.

Syn.: *Agrostis alpicola* Hochst. 1855. – Cufodontis 1968a: 1228.

Kaffa: Mt. Maigudo, 2550 m, upland evergreen bushland (*Hagenia abyssinica* zone). 1500 (C, ETH, K).

New to Kaffa.

*Pentaschistis imatongensis* Hubb. 1936

Andrews 1956: 519; Clayton 1970: 128.

Shoa: Entoto Hill, 2600 m, *Eucalyptus* plantation, at small stream. 1349 (C, ETH, K).

New to Shoa. – Clayton (l.c.) records this species for Ethiopia without further locality.

*Phaenanthoecium koestlinii* (A. Rich.) Hubb. 1936

Cufodontis 1968a: 1235; Wickens 1976: 182 & Map 199.

Kaffa: Bonga, 1750 m, upland rain forest, in spray zone at waterfall. 2189 (BR, C, ETH, K, WAG).

New to Kaffa. – This seems to be the fifth record of a very rare species which outside Ethiopia is only known from Jebel Marra in the Sudan.

*Eragrostis barrellieri* Dav. 1894

Cufodontis 1968a: 1248.

Kaffa: Jimma, 1700 m, weed in compound of the Agricultural School. 2032 (C, ETH, K).

New to Kaffa. – Probably a casual introduction. The species is widely distributed in the Middle East and the drier parts of Africa.

*Eragrostis kiwuensis* Jedwabnick 1924

Cufodontis 1968a: 1253; Clayton 1974: 229.

Sidamo: N of Kebre Mengist, 2100 m, upland rain forest. 1056 (C, ETH, K).

New to Sidamo.

*Eragrostis paniciformis* (A. Br.) Steud. 1854

Clayton 1974: 219.

Syn.: *Eragrostis tenella* auct., non (L.) Roem. & Schult.: Cufodontis 1968a: 1260.

Kaffa: at Gogeb River, 1400 m, wooded grassland. 2310 (BR, C, ETH, K, WAG).

New to Kaffa.

*Eragrostis paposa* (Roem. & Schult.) Steud. 1840

Sidamo: SE of Neghelle, 1300 m, grassland. 927 (BR, C, ETH, K, WAG).

New to Sidamo.

*Eleusine indica* (L.) Gaertn. 1788

Cufodontis 1968a: 1264; Phillips 1974: 262.

Kaffa: W of Bonga, 1800 m, upland rain forest. 351 (C, ETH).

New to Kaffa.

*Eleusine multiflora* A. Rich. 1851

Cufodontis 1968a: 1265; Phillips 1974: 261.

Kaffa: Jimma, 1700 m, weed in compound of the Agricultural School. 2029 (C, ETH, K).

New to Kaffa.

*Dactyloctenium scindicum* Boiss. 1859

Cufodontis 1968a: 1266; Phillips 1974: 255.

Sidamo: SE of Neghelle, 1600 m, *Acacia-Commiphora* bushland. 896 (C, ETH, K).

New to Sidamo.

*Cypholepis yemenica* (Schweinf.) Chiov. 1908

Cufodontis 1968a: 1267; Phillips 1974: 248.

Sidamo: SE of Neghelle, 1300 m, *Acacia-Commiphora* bushland. 977 (C, ETH, K).

New to Sidamo.



*Tripogon curvatus* S. M. Phillips & Launert 1971

Phillips 1974: 292; Lebrun 1974: 522.

Sidamo: SE of Neghelle, 1600 m, *Acacia-Commiphora* bushland. 898 (C). – Ibidem, 1300 m. 986 (C, ETH, K).

This species has recently been described from Kenya. Our record is the third from Ethiopia.

*Leptochloa rupestris* Hubb. 1941

Cufodontis 1968a: 1271; Phillips 1974: 277.

Sidamo: at Genale Doria, 1100 m, *Acacia-Commiphora* bushland. 1034 (C, ETH, K).

New to Sidamo.

*Sporobolus discosporus* Nees 1841

Cufodontis 1968a: 1274; Clayton 1974: 358.

Sidamo: SE of Neghelle, 1400 m, grassland. 869 (C, ETH, K).

New to Sidamo.

*Sporobolus natalensis* (Steud.) Th. Dur. & Schinz 1895

Cufodontis 1968a: 1278; Clayton 1974: 374.

Kaffa: N of Sheki, 2000 m, upland evergreen bushland 193 (C).

New to Kaffa.

*Helictotrichon umbrosum* (Steud.) Hubb. 1936

Cufodontis 1968a: 1226; Clayton 1970: 88.

Kaffa: N of Sheki, 2600 m, upland evergreen bushland, moist ground. 1641 (C, ETH, K).

New to Kaffa.

*Cynodon aethiopicus* Clayton & Harlan 1970

Clayton 1974: 319.

Illubabor: E of Metu, 1650 m, coffee plantation. 1764 (BR, C, ETH, K).

Described from material collected at Jimma, Kaffa; new to Illubabor.

*Cynodon transvalensis* Burt-Davy 1921

Clayton 1974: 317.

Kaffa: Jimma Agricultural School, 1700 m, in the compound. 2033 (BR, C, ETH, K).

New to Kaffa – Clayton (l.c.) records this species from Ethiopia without further locality.

*Chloris pycnotrix* Trin. 1824

Renvoize 1974: 340.

Syn.: *Chloris radiata* auct. non (L.) Sw.: Cufodontis 1969a: 1291.

Illubabor: at Gabba River, 1200 m, upland evergreen forest. 1761 (BR, C, ETH, K).

New to Illubabor.

*Coelachne africana* Pilger 1916

Hubbard 1974: 436.

Sidamo: N of Kebre Mengist, 2100 m, upland rain forest, at pond. 1083 (C, ETH, K).

Kaffa: Bonga, 1750 m, upland rain forest at waterfall. 2193 (BR, C, ETH, K, WAG).

New to Sidamo and Kaffa. – Hubbard (l.c.) records this species from Ethiopia without further locality.

*Aristida adoensis* A. Rich. 1851

Cufodontis 1969a: 1293; Clayton 1970: 144.

Kaffa: at Giren, 2000 m, *Acacia abyssinica* wooded grassland. 1593 (BR, C, ETH, K, WAG).

New to Kaffa.

*Panicum comorense* Mez 1921

Andrews 1956: 497.

Illubabor: SW of Bure, 1450 m, riverine forest. 1903 (C, ETH, K).

New to Ethiopia.

*Panicum hochstetteri* Steud. 1854

Cufodontis 1969a: 1307.

Kaffa: Mt. Maigudo, 2650 m, upland evergreen bushland (*Erica arborea* zone). 1443 (BR, C, ETH, FI, K, WAG).

New to Kaffa.

*Panicum monticolum* J. D. Hooker 1864

Cufodontis 1969a: 1308.

Illubabor: at Gabba River, 1200 m, riverine forest. 1754 (C, ETH, K). S of Gore, 1700 m, upland rain forest, at brook. 1865 (C, ETH, K).

New to Illubabor.

*Panicum poaeoides* Stapf 1920

Stapf 1920: 681.

Sidamo: SE of Neghelle, 1300 m, *Acacia-Commiphora* bushland. 978 (BR, C, ETH, K).

New to Ethiopia.

*Panicum pusillum* J. D. Hooker 1864

Cufodontis 1969a: 1309.

Sidamo: N of Kebre Mengist, 2100 m, upland rain forest. 1057 (C, ETH, K).

Illubabor: S of Gore, 1700 m, upland rain forest. 1859 (BR, C, ETH, K).

New to Sidamo and Illubabor.

*Panicum subalbidum* Kunth 1831

Cufodontis 1969a: 1310.

Shoa: Bole Gorge, 1650 m, riverine forest, at shallow pond. 1126 (C, ETH, K).

New to Shoa.

*Brachiaria dictyoneura* (Fig. & de Not.) Stapf 1919

Cufodontis 1969a: 1312.

Sidamo: S of Waddere, 1600 m, bushland with *Cussonia holstii* and *Tarchonanthus camphoratus*. 784 (BR, C, ETH, K).

New to Sidamo. – Cufodontis (l.c.) records this species for Ethiopia without further locality.

*Brachiaria distichophylla* (Trin.) Stapf 1919

Cufodontis 1969a: 1313.

Kaffa: at Gogeb River, 1400 m, wooded grassland. 2311 (BR, C, ETH, K, WAG).

New to Kaffa.

*Echinochloa crus-pavonis* (H.B.K.) Schultes 1824

Cufodontis 1969a: 1320.

Illubabor: at Metu, 1520 m, grassland, riverbank. 560 (BR,

C, ETH, FI, K, WAG). – E of Yaiyo, 1300 m, riverine forest. 1965 (BR, C, ETH, K).  
New to Illubabor.

*Echinochloa stagnina* (Retz.) Pal.-Beauv. 1812

Cufodontis 1969a: 1322.

Kaffa: Kochi, 1740 m, grassland, silt zone at permanent pool. 11 (BR, C, ETH, K, WAG).

New to Kaffa.

*Pseudechinolaena polystachya* (H.B.K.) Stapf 1919

Cufodontis 1969a: 1323.

Illubabor: at Gabba River, 1200 m, riverine forest. 1732 (C, ETH, K). – S of Gore, 1750 m, upland rain forest. 1806 (BR, C, ETH, K).

New to Illubabor.

*Oplismenus burmannii* (Retz.) Pal.-Beauv. 1812

Cufodontis 1969a: 1326.

Illubabor: SW of Bure, 1450 m, riverine forest. 1892 (BR, C, ETH, K).

New to Illubabor.

*Oplismenus compositus* (L.) Pal.-Beauv. 1812

Cufodontis 1969a: 1326.

Sidamo: N of Kebre Mengist, 2100 m, upland rain forest. 1077 (C, ETH, K).

New to Sidamo.

*Oplismenus hirtellus* (L.) Pal.-Beauv. 1812

Cufodontis 1969a: 1326.

Illubabor: S of Gore, 1750 m, upland rain forest. 1803 (C, ETH, K).

New to Illubabor.

*Digitaria abyssinica* (A. Rich.) Stapf 1909

Cufodontis 1969a: 1326.

Illubabor: E of Metu, 1650 m, coffee plantation. 1765 (BR, C, ETH, K).

Kaffa: Jimma Agricultural School, 1700 m, in the compound. 2040 (BR, C, ETH, K).

New to Illubabor and Kaffa.

*Digitaria rivae* (Chiov.) Stapf 1907

Cufodontis 1969a: 1331.

Sidamo: SE of Neghelle, 1300 m, *Acacia-Commiphora* bushland. 981 (C, ETH, K).

New to Sidamo.

*Digitaria velutina* (Forssk.) Pal.-Beauv. 1812

Cufodontis 1969a: 1333.

Kaffa: NW of Aro, 1700–1800 m, 'coffee forest'. 140 (BR, C, ETH, K, WAG). – Jimma Agricultural School, 1700 m, in the compound. 2030 (BR, C, ETH, K).

New to Kaffa.

*Paspalum scrobiculatum* L. 1767 var. *commersonii* (Lam.) Stapf 1919

Stapf 1919: 573.

Syn.: *Paspalum commersonii* Lam. 1791. – Cufodontis 1969a: 1335.

Illubabor: at Gabba River, 1200 m, riverine forest. 1748 (C, ETH, K).

New to Illubabor.

*Setaria trinervia* Stapf 1930

Andrews 1956: 533.

Sidamo: SE of Neghelle, 1400 m, grassland. 877 (C, ETH, K).

New to Ethiopia. – Very closely related to the W African *Setaria aurea* Hochst. ex A.Br.

*Beckeropsis petiolaris* (Hochst.) Fig. & de Not. 1854

Cufodontis 1969a: 1354.

Kaffa: Bonga, 1750 m, grassland. 2261 (BR, C, ETH, K, WAG).

New to Kaffa.

*Melinis macrochaeta* Stapf & Hubb. 1926

Andrews 1956: 487.

Illubabor: N of Nopa, 1600 m, *Acacia abyssinica* woodland. 586 (BR, C, ETH, K).

New to Ethiopia.

*Melinis tenuinervis* Stapf 1922

Andrews 1956: 488.

Kaffa: at Giren, 2000 m, *Acacia abyssinica* woodland. 1594 (C, ETH, K).

New to Ethiopia.

*Melinis tenuissima* Stapf 1900

Cufodontis 1969a: 1359.

Illubabor: at Gabba River, 1200 m, riverine forest. 1738 (BR, C, ETH, K).

New to Illubabor.

*Imperata cylindrica* (L.) Pal.-Beauv. 1812

Cufodontis 1969a: 1362.

Kaffa: E of Bonga, 1500 m, wooded grassland. 2281 (BR, C, ETH, K, WAG).

New to Kaffa.

*Arthraxon quartianus* (A. Rich.) Nash 1912

Andrews 1956: 399; Clayton 1972: 470.

Syn.: *Arthraxon hispidus* auct. non (Thunb.) Makino: Cufodontis 1970a: 1387.

Illubabor: S of Gore, 1750 m, upland rain forest. 1840 (BR, C, ETH, K).

New to Illubabor.

*Schizachyrium brevifolium* (Sw.) Nees 1829

Cufodontis 1970a: 1400.

Sidamo: N of Kebre Mengist 2200 m, upland rain forest. 1091 (BR, C, ETH, K).

Illubabor: at Gabba River, 1200 m, riverine forest. 1749 (C, ETH, K).

New to Sidamo and Illubabor.

*Hyparrhenia mobukensis* (Chiov.) Chiov. 1919

Clayton 1969: 48.

Kaffa: Mt. Maigudo, 2550 m, upland evergreen bushland (*Hagenia abyssinica* zone). 1516 (C, ETH, K).

New to Ethiopia.

*Coelorhachis afraurita* (Stapf) Stapf 1917

Andrews 1956: 420; Clayton 1972: 509.

Kaffa: Kochi, 1690 m, grassland, floating bog. 2079 (BR, C, ETH, K).

New to Ethiopia.

**Cyperaceae** (I. Friis)

*Cyperus dereilema* Steud. 1842

Cufodontis 1970a: 1422.

Kaffa: N of Sheki, 2600 m, grassland. 1642 (BR, C, ETH, K, WAG).

New to Kaffa.

*Cyperus fischeranus* A. Rich. 1851

Cufodontis 1970a: 1425.

Sidamo: N of Kebre Mengist, 2100 m, upland rain forest. 1075 (C).

New to Sidamo.

*Cyperus haspan* L. 1753

Cufodontis 1970a: 1427.

Kaffa: Kochi, 1700 m, grassland with oozing water. 44 (BR, C, ETH, FI, K, WAG).

New to Ethiopia.

*Cyperus nudicaulis* Poir. 1806

Andrews 1956: 338; Hooper & Napper 1972: 293.

Kaffa: Kochi, 1700 m, grassland with oozing water. 2063 (BR, C, ETH, K, WAG).

New to Ethiopia.

*Pycreus flavescens* (L.) H. G. Reich. 1830

Cufodontis 1970a: 1441.

Illubabor: S of Gore, 1750 m, upland rain forest, at brook. 1823 (BR, C, ETH, K).

New to Illubabor.

*Pycreus pauper* (A. Rich.) C. B. Clarke 1895

Cufodontis 1970a: 1444.

Kaffa: Kochi, 1700 m, grassland with oozing water. 8 (BR, C, ETH, K).

New to Kaffa.

*Mariscus rubrotinctus* Chermesson 1919 (det. S. Hooper)

Cufodontis 1970a: 1455.

Illubabor: S of Gore, 1750 m, upland rain forest, at brook-let. 1824 (BR, C, ETH, K).

New to Illubabor.

*Kyllinga elatior* Kunth 1837

Hooper & Napper 1972: 305.

Syn.: *Kyllinga polyphylla* Kunth 1837 var. *elatior* (Kunth) Kùchenthal 1925. – Cufodontis 1970a: 1464.

Kaffa: W of Bonga, 2000 m, upland rain forest 340 (BR, C, ETH, K, WAG). – Sheki, 1750 m, upland rain forest, at brook. 1668 (C, ETH, K).

Illubabor: E of Yaiyo, 1500 m, upland rain forest. 2005 (C, ETH, K).

New to Kaffa and Illubabor.

*Fuirena pubescens* (Poir.) Kunth 1837

Cufodontis 1970a: 1468.

Kaffa: at Gabba River, 1400 m, wooded grassland, small swamp. 2304 (BR, C, ETH, K, WAG).

New to Kaffa.

*Scirpus fluitans* L. 1753

Cufodontis 1970a: 1469.

Sidamo: N of Kebre Mengist, 2100 m, upland rain forest, in pond. 1087 (C, ETH, K).

Shoa: Entoto Hill, 2600 m, pond in *Eucalyptus* plantation. 1299 (C, ETH, K).

New to Sidamo and Shoa.

*Eleocharis acutangula* (Roxb.) Schult. 1824

Andrews 1956: 359; Hooper & Napper 1972: 314.

Kaffa: Kochi, 1700 m, grassland with oozing water. 38 (BR, C, ETH, K, WAG).

New to Ethiopia.

*Fimbristylis hispidula* (Vahl) Kunth 1837

Cufodontis 1970a: 1477.

Kaffa: at Gogeb River, 1400 m, wooded grassland. 2309 (BR, C, ETH, K, WAG).

New to Kaffa.

*Fimbristylis ovata* (N. L. Burm.) Kern 1967

Cufodontis 1970a: 1479.

Sidamo: S of Waddere, 1600 m, bushland with *Cussonia holstii* and *Tarchonanthus camphoratus*. 839 (C, ETH, K).

New to Sidamo.

*Scleria nutans* Kunth 1837

Cufodontis 1971: 1488.

Kaffa: Bonga, 1800 m, upland rain forest, swamp. 378 (BR, C, ETH, FI, K, WAG).

New to Kaffa.

*Carex bequaertii* De Wild. 1927

Cufodontis 1971: 1490.

Shoa: Menagesha Forest, 2600 m, upland dry evergreen forest. 1267 (C, ETH, K).

New to Shoa.

*Carex thomasi* Nelmes 1938 (det. S. Hooper)

Andrews 1956: 330.

Kaffa: N of Sheki, 2600 m, upland evergreen bushland. 1640 (BR, C, ETH, K, WAG).

New to Ethiopia. – Probably the second collection of this rare species which was described from a specimen collected in the Imatong Mts., S Sudan.

**Araceae** (I. Friis)

*Arisaema schimperanum* Schott 1859

Cufodontis 1971: 1503.

Sidamo: N of Kebre Mengist, 2100 m, upland rain forest. 1080 (C, ETH, K).

New to Sidamo.

**Eriocaulaceae** (I. Friis)

*Eriocaulon dembianense* Chiov. 1911

Cufodontis 1971: 1507.

Kaffa: Kochi, 1700 m, grassland with oozing water. 2076 (BR, C, ETH, K).

New to Kaffa.

**Commelinaceae** (I. Friis)

*Commelina stefaniniana* Chiov. 1916

Cufodontis 1971: 1515.

Sidamo: SE of Neghelle, 1300 m, *Acacia-Commiphora* bushland. 938 (C, ETH).

New to Sidamo.

*Aneilema aequinoctiale* (Pal.-Beauv.) Kunth 1843

Cufodontis 1971: 1516.

Illubabor: at Gabba River, 1200 m, riverine forest. 1763 (BR, C, ETH, K).

New to Illubabor.

*Aneilema beniniense* (Pal.-Beauv.) Kunth 1843

Cufodontis 1971: 1517.

Kaffa: at Gogeb River, 1400 m, edge of riverine forest. 2315 (BR, C, ETH, K, WAG).

New to Kaffa.

*Aneilema pedunculatum* C. B. Clarke 1881 (det. J. P. M. Brenan)

Faden 1974: 667.

Illubabor: N of Nopa, 1300 m, upland rain forest. 580 (BR, C, ETH, K, WAG).

New to Ethiopia.

*Aneilema gillettii* Brenan 1961

Brenan 1961: 212.

Sidamo: at Genale Doria, 1100 m, *Acacia-Commiphora* bushland. 1044 (C, ETH, K).

New to Ethiopia. – This is the second record of this species which was described on material from NE Kenya.

**Juncaceae** (I. Friis)

*Juncus bufonius* L. 1753

Cufodontis 1971: 1522.

Kaffa: Mt. Maigudo, 2400 m, upland evergreen bushland. 489 (C, ETH, K).

New to Kaffa.

*Luzula abyssinica* Parl. 1852

Cufodontis 1971: 1525; Hedberg 1971: 124.

Shoa: Menagesha Forest, 2700 m, upland evergreen bushland (*Erica arborea* zone). 1233 (C, ETH, K).

New to Shoa.

**Liliaceae** (I. Friis)

*Anthericum zavattarii* Cuf. 1939

Cufodontis 1971: 1532.

Sidamo: SE of Neghelle, 1600 m, *Acacia-Commiphora* bushland. 915 (BR, C, ETH, K, WAG).

Hitherto only known from the type collection which also originate from S Sidamo.

*Urginea altissima* (L.f.) Baker 1873

Cufodontis 1971: 1554.

Kaffa: at Gogeb River, 1250 m, wooded grassland. 2352 (C, ETH, K).

New to Kaffa.

*Ornithogalum donaldsonii* (Rendle) Greenway 1969

Cufodontis 1971: 1561.

Sidamo: SE of Neghelle, 1250 m, *Acacia-Commiphora* bushland. 990 (C, ETH, K).

New to Sidamo.

**Agavaceae** (I. Friis)

*Dracaena afromontana* Mildbr. 1914

Cufodontis 1971: 1567.

Illubabor: S of Gore, 1750 m, upland rain forest. 1832 (C, ETH, K).

New to Illubabor.

*Dracaena fragrans* (L.) Ker-Gawl. 1808

Cufodontis 1971: 1568.

Illubabor: E of Yaio, 1300 m, upland rain forest. 1959 (C, ETH, K). – Ibidem, 1600 m, edge of coffee plantation. 1999 (BR, C, ETH, K).

New to Illubabor.

*Sansevieria nilotica* Baker 1875

Cufodontis 1971: 1570.

Illubabor: S of Bure, 1450 m, edge of riverine forest. 1902 (BR, C, ETH, K, WAG).

New to Illubabor.

**Amaryllidaceae** (I. Friis)

*Scadoxus nutans* (Friis & Bjørnst.) Friis & Nordal 1976

Friis & Nordal 1976: 64.

Syn.: *Haemanthus nutans* Friis & Bjørnst. 1971. – Friis & Bjørnstad 1971: 227.

Illubabor: S of Gore, 1750 m, upland rain forest (Fig. 25). 1782 (BR, C, ETH, K).

New to Illubabor (Fig. 25).

**Dioscoreaceae** (I. Friis)

*Dioscorea gillettii* Milne-Redh. 1963

Milne-Redhead 1975: 7.

Sidamo: SE of Neghelle, 1300 m, *Acacia-Commiphora* bushland. 943 (BR, C, ETH, K, WAG). – W of Filtu, 1250 m, *Acacia-Commiphora* bushland. 1003 (C).

New to Ethiopia. – Second and third record of this species which was described on material collected in NE Kenya.

**Orchidaceae** (F. N. Rasmussen)

*Habenaria cultriformis* Kraenzl. 1892

Cufodontis 1972: 1609.

Sidamo: SE of Neghelle, 1600 m, grassland. 917 (C).

New to Sidamo.

*Cynorkis anacamptoides* (Kraenzl.) Rolfe 1898

Cufodontis 1972: 1599.

Kaffa: Belleta Forest, 2000 m, upland rain forest. 106 (BR, C, ETH, K, WAG). – N of Bonga, 1750 m, upland rain forest. 2201 (C).

New to Kaffa.

*Epipactis africana* Rendle 1895

Cufodontis 1972: 1611.

Kaffa: Mt. Maigudo, 2650 m, upland evergreen bushland. 1471 (C).

New to Kaffa.

*Epipactis veratrifolia* Boiss. 1854

Cufodontis 1972: 1611.

Shoa: Bole Gorge, 1650 m, riverine forest, on moist cliff (Fig. 26). 1106 (BR, C, ETH, FI, K, WAG).

New to Shoa. – Probably the southernmost record of this species distributed in the Middle East (Fig. 26).

*Cheirostylis lepida* (H. G. Reich.) Rolfe 1897

Summerhayes 1968: 208.

Kaffa: Bonga, 1900 m, upland rain forest. 2121 (C, ETH, K). – N of Bonga, 1750 m, upland rain forest. 2231 (BR, C, ETH, FI, K, WAG).

New to Ethiopia.

*Oberonia disticha* (Lam.) Schltr. 1924

Stewart 1974: 756.

Kaffa: Bonga, 1700 m, coffee plantation, epiphyte. DEBL 73 – 47 (C).

New to Ethiopia.

*Liparis deisteli* Schltr. 1906

Stewart 1974: 760.

Kaffa: Bonga, 1900 m, upland rain forest, epiphytic on trunks of *Cyathea mannii*. DEBL 70 – s.n. (C).

Illubabor: S of Gore, 1700 m, upland rain forest, epiphytic on trunks of *Cyathea mannii*. DEBL 72 – 41 (C).

New to Ethiopia.

*Polystachya bennettiana* H. G. Reich. 1881

Cufodontis 1972: 1612.

Syn. nov.: *Polystachya rivae* Schweinf. 1894. Cufodontis 1972: 1613.

Kaffa: N of Jimma, 1700–1800 m, coffee plantation, epiphytic on shade tree. DEBL 70–05 (C). – S of Sheki, 1750 m, upland rain forest, epiphyte. DEBL 72 – 20 (C). – Bonga, 1700 m, upland rain forest, epiphytic. DEBL 73–51. (C).

Illubabor: E of Metu, 1650 m, upland rain forest, epiphytic.

DEBL 72 – 31. (C). – S of Gore, 1750 m, upland rain forest, epiphytic. DEBL 72 – 30 (C). Ibidem, 1700 m. (Fig. 27). DEBL 72 – 35 (C).

New to Kaffa and Illubabor (Fig. 27). – Examination of the type specimens of both *P. bennettiana* and *P. rivae* has revealed no satisfactory differences for distinguishing these two entities. Rolfe (1898: 104–105) uses the length of flowers as the diagnostic character in his key, stating that *P. rivae* has flowers 6 lin. (12.6 mm) long, while those of *P. bennettiana* are no more than 4 lin. (8.5 mm) long. On examination of the large material available at K and C the flower-length is seen to vary continuously from 6 to 15 mm. It should be further noted that this species is indeed closely related to *P. albescens* Ridl. 1888, but the taxonomic status of these two entities can only be established when more studies have been undertaken.

*Polystachya caduca* H. G. Reich. 1881

Cufodontis 1972: 1612.

Sidamo: N of Kebre Mengist; 2200 m, upland rain forest. DEBL 72–12. (C).

New to Sidamo.



Fig. 25. *Scadoxus nutans* in upland rain forest S of Gore (Illubabor) at 1700 m.

*Polystachya concreta* (Jacq.) Garay & Sweet 1974

Garay & Sweet 1974: 178.

Syn.: *Polystachya tessellata* Lindl. 1862. Andrews 1956: 325; Stewart 1974: 768.

Illubabor: S of Gore, 1750 m, upland rain forest. DEBL 72 - 28 (C).

New to Ethiopia.

*Polystachya aethiopica* Cribb 1978

Cribb 1978a: 749.

Sidamo: N of Kebre Mengist, 2100 m, upland rain forest. DEBL 72 - 03 (C).

Kaffa: Folla, 2300 m, upland rain forest. DEBL 70 - 04 (C).

Illubabor: S of Gore, 1700 m, upland rain forest. DEBL 72 - 37 (C).

New to Sidamo, Kaffa and Illubabor. - This species was recently described by Cribb (l.c.) on material from Shoa and Arussi, where the species occurs in open woodland. It is closely allied to *P. lindblomii* Schltr., but differs in the much broader leaves.

*Polystachya golungensis* H. G. Reich. 1865

Stewart 1974: 768.

Kaffa: E of Bonga, 1500 m, wooded grassland. 2321 & DEBL 73 - 57 (C).

New to Ethiopia.

*Polystachya lindblomii* Schltr. 1922

Cufodontis 1972: 1613; Cribb 1978a: 751.

Kaffa: at Gogeb River, 1250 m, riverine forest. DEBL 73 - 56 (C).

New to Kaffa.

*Polystachya simplex* Rendle 1895

Cribb 1978a: 754.

Kaffa: at Gogeb River, 1250 m, riverine forest. DEBL 73 - 58 (C).

New to Ethiopia.

*Polystachya steudneri* H. G. Reich. 1881

Cufodontis 1972: 1614.

Kaffa: at Gogeb River, 1250 m, wooded grassland. 2356 (C, ETH, K).

New to Kaffa.

*Stolzia repens* (Rolfe) Summerh. 1953

Stewart 1974: 772; Cribb 1978b: 87.

Shoa: Menagesha Forest, 2600 m, upland dry evergreen forest (specimen with yellow flowers). DEBL 72 - 14 (C).

Kaffa: at Gogeb River, 1250 m, riverine forest (specimen with transparent flowers with red stripes). 2328 & DEBL 73 - 55 (C, K).

New to Shoa and Kaffa. - Cribb (l.c.) records this species for Ethiopia without further locality. He records two rather distinct forms from Uganda, one with greenish flowers and another with orange flowers. Both our collections fall within the range of variation of this species as conceived by Cribb.

*Bulbophyllum schlechteri* De Wild. 1921

Robyns & Tournay 1955: 493; Stewart 1974: 760.



Fig. 26. *Epipactis veratrifolia* in riverine forest in Bole Gorge (Shoa) at 1650 m.

Illubabor: S of Gore, 1700 m, upland rain forest. DEBL 72 - 39 (C).

Kaffa: Bonga, 1700, upland rain forest. DEBL 73 - 49 (C).  
New to Ethiopia.

*Bulbophyllum lupulinum* Lindl. 1862

Summerhayes 1968: 239.

Illubabor: E of Yaiyo, 1300 m, riverine forest. 2360 & DEBL 72 - 43 (C).

New to Ethiopia.

*Oeceoclades saundersiana* (H. G. Reich.) Garay & Taylor 1976

Garay & Taylor 1976: 270.

Syn.: *Eulophidium saundersianum* (H. G. Reich.) Summerh. 1957. - Stewart 1974: 782.

Illubabor: E of Yaiyo, 1300 m, riverine forest. DEBL 72 - 42 (C).

New to Ethiopia.

*Angraecum humile* Summerh. 1958

Stewart 1974: 785.

Kaffa: Bonga, 1700 m, 'coffee forest'. DEBL 73 - 48 (C).  
New to Ethiopia.



Fig. 27. *Polystachya bennettiana*, a frequent epiphyte in upland rain forest and coffee plantations in Kaffa and Illubabor; here photographed in the Copenhagen Botanical Garden.

*Angraecum infundibulare* Lindl. 1862

Cufodontis 1972: 1619.

Illubabor: at Gabba River, 1200 m, riverine forest. DEBL 72 - 22 (C).

New to Illubabor.

*Microcoelia guyoniana* (H. G. Reich.) Summerh. 1945

Cufodontis 1972: 1622.

Kaffa: N of Jimma, 1700-1800 m, 'coffee forest'. DEBL 70 - 06 (C). - Bonga, 1750 m, 'coffee forest'. 2359 & DEBL 73 - 46 (C).

New to Kaffa.

*Diaphananthe tenuicalcar* Summerh. 1945

Cufodontis 1972: 1620.

Sidamo: N of Kebre Mengist, 2100 m, upland rain forest. DEBL 72 - 07 (C).

New to Sidamo.

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