THE WOODY VEGETATION OF THE COAST PROVINCE OF KENYA

by

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APPENDIX

ADDITIONS AND CORRECTIONS

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By I. R. Dale.

Geography.—Apart from the low coastal ranges south of the Tana and the Teita Hills the Coast Province of Kenya is somewhat flat and uninteresting. East of the Tana River the land rises so slowly that one has to go some fifty miles inland to rise 400 feet; Garissa, some 160 miles up the Tana, is only about 350 feet above sea-level.

W. and S.W. of the Tana, at about 10 to 20 miles inland, there are low ranges of hills, seldom above 1,200 ft. in height. The highest points are Mangea, 1,702 ft. in the north and 25 miles inland from Malindi, and Jombo, 1,543 ft., south of the Ramisi River. West of these coastal hills the land rises very gradually to Voi, which has an altitude of about 2,500 ft. and is 100 miles inland from Mombasa.

The plains south of the railway line are relieved by a few hills of volcanic origin, most noticeable of which is Mt. Kasigau, 5,393 ft.

In the neighbourhood of Voi the Teita Hills are an impressive addition to the landscape; the highest point is Vuria, 7,248 ft. From these hills the land slopes away northwards to the Tsavo River and westwards to Taveta at 2,500 ft.

Other than the streams in the immediate coastal belt, and the Umba River which flows from the Usambaras, the only rivers are the Sabaki or Athi and the Tana. Both these streams derive their waters from the Aberdares, but the Tana also taps Mt. Kenya, and the Athi receives Kilimanjaro water from the Tsavo. The amount of water that arrives at the coast, except possibly in flood conditions, is a small fraction of the intake owing to the porous nature of the soil of the intermediate country and the arid climate. The Voi River only reaches the sea in times of exceptional flood.

Climate.—The flatness of the land accounts largely for its lack of rain, and its sterility.

The N.E. Monsoon, the Kas kazi, blows from October to February and is usually a dry wind. The S.E. 'Monsoon,' or Trade Wind, the 'Kusi,' blows from April to August. April to June are the months of heaviest rainfall on the coast, but rain is also common in the months of March and September, when the wind is changing. It will be noted that the rain winds come chiefly from the south and this in conjunction with the presence of the coastal hills causes most of the deposition to occur in

C. Teita Hills.

Wandanye ...	...	51.4	Dabida Mission	...	48.0
Wesu ...	...	50.7			

D. Taveta.

Taveta ...	...	22.5

The above figures are averages taken over a varying number of years up to 1934. There are too few stations to make conclusions accurately, but the difference in the rainfall of Kilifi (33.8 ins.) and Sokoke (45.7 ins.) about 10 miles inland and 400 feet higher is noticeable. The figure of 30 inches for Mackinnon Road is remarkable.

Rocks and Soils.—I have had to rely on the Amani Soil Map of E. Africa, which, as regards the Coast Province, is not too lucid, and Dr. E. Parson's geological map of the coast from Vanga to Mambrui, which though excellent for the rocks is not so useful from the soil point of view.

At Taveta the distribution of 'volcanic soil on ash' is not quite as shown on the map. There are two main patches along the Lumi River and at Kitobo, there being a gneissic range of hills in between but not to the west.

The information shown on the print as to the extent of the plains soil on the Serengetti plains, and the red earths of the Bura Hills, is said not to have been fully verified.

The Amani soil map names the following soils as comprising the Coastal Complex:—Loose sands, black or grey clays non-calcareous of bottom lands, red earths non-laterised on sandstones, and mottled clays ('palimpsest soils'). These probably include soils of the Miritini series, etc., as well as those of the Magarini series.

The Magarini series continues right through to the Italian frontier, I think, and probably runs a long way inland.

The Miritini series 'consists of shales with argillaceous and coral limestones and a few sandstones.' Sands are not common, by far the commonest soil being shaly.

The Shimba Grit Group is well exposed along the chief ranges of coastal hills. 'The individual members vary considerably in character, from coarse felspathic grits to fine grained sandstones with a few shaly partings. The Mazeras sub-group consists of grits and sandstones intercalated with variegated coloured clays.'

The Mariakani sandstones 'consist in the main of massive mottled grey quartzitic sandstones. High up in the group are shaly conglomeratic beds.' The soils are either shaly or sandy, as far as I know.

The soils of the Maji ya Chumvi group are very shaly.

PRIMARY WOODLAND.

1. **Mangrove Swamp.**—Mangroves occur in tidal estuaries and lagoons all along the coast. They do not grow in fresh water nor in heavy surf. Where they face the open sea coral reefs are present to break the force of the waves.

Except for one or two species, mud is essential for growth and the better the mud the better the growth. Consequently the best mangroves in Kenya are to be found at the mouth of the Tana River which brings down red coffee soil from the Kikuyu reserve.

The area of the Kenya mangrove reserves is estimated at 111,000 acres, of which 72,000 acres are exploitable, the rest being open sand or scrub growth. The most extensive mangrove system is in the Lamu archipelago which receives deposits of Tana mud from the northerly flowing coastal current; the merchantable area is reckoned at 40,000 acres. The Vanga-Funzi mangrove system of 10,000 acres, into which drain the Mwena and the Ramisi from the Digo reserve and the Umba from the Usambaras, is the next largest.

The Ngomeni-Fundi Isa mangroves receive mud from the Sabaki or Athi River as also does probably North Kilifi, though there is a good deposit there from the days when the Tana flowed to the sea through this passage.

Mangrove swamps occur also at Gazi, Mombasa, Mtwapa, Kilifi and Mida, though the areas are small. For clarity the mangrove areas are shown diagrammatically on the accompanying maps.

The number of mangrove species in Kenya are few: the following trees are recognised:—*Rhizophora mucronata, Bruguiera gymnorrhiza, Ceriops tagal, Sonneratia caseolaris, Avicennia marina, Lumnitzera racemosa, Xylocarpus benadirensis, X. moluccensis,* and *Heritiera littoralis.*

Sonneratia is the first coloniser of flats and banks which are gradually rising from the sea. Where accretion of mud goes on the tree does not survive in competition with Rhizophora.

Rhizophora is by far the commonest and most important mangrove. It comprises about 70 per cent. of the stand and is usually pure except for occasional specimens of Bruguiera.

Ceriops is largely confined to a definite belt on the landward side of the Rhizophora, where the mud is thin.

Avicennia is perhaps the first coloniser of poor swamp land where the mud is thin. It is to be found on the landward edge of sand flats where some soil has been washed down from the cliffs. The tree is often found also on the seaward edge of the Rhizophora, where it can no doubt better withstand the scour of the tides.

Homalium sp., Mti chuma, *Lonchocarpus laxiflorus, Balanites wilsoniana, Chlorophora excelsa, and Cassipourea euryoides.*

The under-storey is largely composed of:—*Uvaria* sp., Mwanga jini, *Diospyros* sp. (Mwaa), *Holarrhena febrifuga* (? Mti mweupe), Mthihabi, *Drypetes major*, Msewe, *Antidesma venosum*, *Harrisonia abyssinica* (at edge), *Diospyros mespiliformis, Memecylon* sp. (Mpepe), *Cola clavata*, Mlingani, *Ochna mossambicensis, Canthium* spp., *Grewia* sp., *Haplocoelum* sp., *Pachystela subverticillata, Coffea eugenioides* and *Rinorea* spp. The *Rinorea* spp., *Pachystela, Grewia, Canthium* spp., *Coffea, Ochna, Memecylon*, Mwanga jini and *Cola* are by far the most common.

The Tana River forests, if ever there were any, have been cut out in the Coast Province. *Populus denhardtiorum* is noticeable along this river.

The Afzelia-Trachylobium forest which occurs at Mida-Gede and near Tezo towards Kilifi is the last remnant of what must have been a widely spread type. It is probable that Gongoni Hill near Mtwapa and a few forested patches near Diani are also of this type, but as they occur on private land I have not visited them.

The chief trees of this forest type, which occurs on greyish sand, are:—*Afzelia quanzensis* (Mbambakofi) and *Trachylobium verrucosum* (Gum Copal). Other trees of the top storey are:—*Combretum schumannii, Tamarindus indica, Mimusops usambarensis, Manilkara cuneifolia, Memecylon gilgianum, Dialium orientale, Cistanthera parvifolia, Pleurostylia* sp. (nr. *P. africana*), *Balanites wilsoniana, Cussonia zimmermannii, Dobera roxburghii*, and *Cassipourea euryoides*. Common shrubs are:—*Asteranthe asterias, Monodora veithii, Ludia sessiliflora, Rinorea elliptica, Ochna* spp., *Memecylon* sp., *Grewia* spp., *Drypetes major, Oxyanthus speciosus* and a large number of the shrubs listed under Secondary Scrub. At the Tezo end of the forest there is some *Cylicodiscus battiscombei.*

The kayas along the Rabai-Chooni Hills are as far as I can gather of the same type as Cha Simba Forest on the Shimba Hills. Kayas are wooded patches, usually on hill tops, which have local sanctity.

Mwachi Forest has, as recorded below, the hill-crests bearing poor *Brachystegia oliveri.* The steep slopes of the Mwachi and Duruma rivers are very rocky and there is no good forest. The chief species are:—*Gyrocarpus asiaticus,* Mfunda (*Nectaropetalum kaessneri* and other species?), *Acacia* sp., *Commiphora* sp., *Spirostachys africana, Diospyros vaughaniae, Croton jatrophoides, Dalbergia melanoxylon*, and *Dobera roxburghii.* It is probable that Afzelia and a little Brachylaena were once present but the best timber trees have long been cut out.

The new Mailuganji forest reserve is protected from the rain winds by the Shimba Hills, so that the forest is of a drier type than one would

Pavetta tarennoides, Grumilea lauracea, and *Cola clavata.* This list is far from complete.

One of the most striking features of the forests south of Mombasa is the presence of species of Albizzia. These trees are not to be found east of the Tana, as far as I am aware, and are rare north of Kilifi. Without enumerations the proportions of the various species are difficult to estimate. Some of the trees listed above must be somewhat rare.

The high forest on Jombo only begins half way up, ca. 750 ft., and owing to the steepness and rockiness of the hill it is not of a high class. Half the stand is composed of *Memecylon gilgianum; Bombax rhodognaphalon* and *Dialium orientale* are common. There is no Afzelia or Trachylobium present (*fide* Mr. Kelly).

Marenji forest is of a mixed type. In the north the soil is reddish and supports forests of *Combretum schumannii, Lonchocarpus laxiflorus, Maba abyssinica, Gyrocarpus asiaticus* and *Sterculia appendiculata.* In the centre the forest becomes more mixed and at the southern end (Ganda) Afzelia and Trachylobium are not uncommon. *Chlorophora excelsa* occurs scattered throughout. What is distinctive in this forest is the presence of *Cordyla africana,* which does not occur elsewhere in Kenya except at Taveta. The presence of *Ostryoderris stuhlmannii* at the forest edge is also peculiar to this forest, though the tree occurs in the savanna woodland to the west.

4. **Lowland Evergreen Edaphic Forest.**—(*a*) *Riparian Forest.*—The Taveta forests, though unique in Kenya, are similar in composition with the Lower Pare forests in Tanganyika, and also have affinities with the S. Digo forests on the coast.

The forests are of small extent (not more than two square miles) and occur on volcanic ash in the vicinity of streams and rivers. The tree growth is as good as anything in the country. The chief timber trees are *Diospyros mespiliformis, Albizzia glabrescens, Albizzia gummifera, Celtis kraussiana, Celtis* sp., *Piptadenia buchananii, Trichilia emetica, Mimusops usambarensis, Cordyla africana,* and *Chlorophora excelsa.* Other trees that occur are *Cordia abyssinica, Ficus mallotocarpa, F. kirkii, Conopharyngia sp., Croton macrostachys, Maba abyssinica, Neoboutonia macrocalyx, Funtumia latifolia, Acacia* sp. (Murimba), *Tapura fischeri, Alangium salvifolium* subsp. *hexapetalum, Phoenix reclinata, Elaeis guineensis, Trema guineensis, Rauvolfia* sp., *Vangueria acutiloba, Allophylus* sp., *Kigelia aethiopica, Sorindeia obtusifoliolata, Cordia ovalis,* and *C. goetzei.* The forest floor is fairly clean. Outside the forest towards Lake Jipe the forest peters out into *Phoenix reclinata* with *Acacia stuhlmannii.*

(*b*) *Palm Stands.*—Though most of the palm stands on the coast are of a secondary nature they are conveniently recorded here all together.

flats near Ganda (Marenji) I have seen *Entada abyssinica*, and *Syzygium mumbwaense* probably also occurs. The presence of trees which also occur in the Nzoia bushland savanna, 4,500—5,500 ft., is noticeable in the savanna and secondary scrub in the S. Digo country.

5. **Lower Montane Evergreen Rain-forest.**—Though the classification is open to doubt I have placed in this formation Kasigau Forest.

This forest of 500 acres occurs from 4,000 ft. to 5,393 ft., the summit. Deposition of water is largely from mist and clouds, which gather round at this one cool spot in an arid district. Similar forest is to be found on hills in the Kitui district. The forest is remarkable in that half the stand is composed of *Piptadenia buchananii*. Other trees occurring are *Albizzia gummifera*, *Syzygium* sp., *Strombosia* sp., *Teclea viridis*, *Rapanea rhododendroides*, *Conopharyngia holstii*, *Cussonia spicata*, *Schefflera* sp., *Xymalos monospora* and *Trichilia emetica*. Where the soil is sparse small *Syzygium guineense* and Rapanea occur. Very rocky places as on the Teita Hills support the heath, *Philippia usambarensis*.

The undergrowth of the high forest is light; *Urophyllum holstii*, *Piper capense*, *Dasylepis* sp., *Plectranthus* sp., *Toddalia asiatica*, *Dracaena* sp. and ferns are common. *Lobelia gibberoa* occurs in wet places.

6. **Upper Montane Evergreen Rain-forest.**—This type is limited to the Bura and Sagalla Hills (Teita Hills) above 4,500 ft. The area is densely inhabited but there are a few patches of forest at Chowia, Susu, Ngangao Hill and Mbololo Hill to indicate the original flora. The total acreage of all the forests is not more than 2 square miles. The forests are of the *Ocotea usambarensis* type. Trees to be found in the high forest are *Strombosia* sp., *Piptadenia buchananii*, *Syzygium* sp., *Albizzia gummifera*, *Neoboutonia macrocalyx*, *Macaranga kilimandscharica*, *Polyscias kikuyuensis*, *Cussonia* spp., *Allophylus abyssinicus*, *Conopharyngia holstii*, *Xymalos monospora*, *Ocotea usambarensis*, *Podocarpus* spp., *Millettia* sp., *Rapanea rhododendroides*, *Lachnopylis floribunda*, *Garcinia volkensii*, *Sideroxylon* sp., *Ekebergia rueppelliana*, and *Pygeum africanum*.

The deforested lands where not cultivated bear a scrub not dissimilar to that of the Embu or Lower Limuru country. *Phoenix reclinata* is common in wetter places. Shrubs occurring are:—*Coleus barbatus*, *Dalbergia lactea*, *Heteromorpha arborescens*, *Cassia didymobotrya*, *Grewia similis*, *Vangueria linearisepala* and *V. apiculata*, *Dovyalis abyssinica*, *Abutilon usambarense* and *A. zanzibaricum*, *Vitex strickeri*, *Clerodendrum johnstoni*, *Senecio multicorymbosus*, *Ehretia silvatica*, *Acokanthera longiflora*, *Cluytia abyssinica*, *Lantana salvifolia*, *Trema guineensis*, *Englerodaphne leiosiphon*, *Turraea holstii*, *Maesa lanceolata*, *Buddleja* sp. and *Coleus umbrosus*.

FIG. 1. 'MRIHI FOREST.
In the Brachystegia Forest near Kilifi, Coast Division, Kenya Colony.
Photo by G. H. Donald. Copyright reserved.

Both these Boni forests have a rather sandier soil than is usual for the type.

The Muhuhu between Gandi and Dakatcha is scattered. On the quartz occurring on some of the hill tops (this is the area of 'igneous intrusions' on Dr. Parson's map) the Muhuhu is denser and is mixed with a small Strychnos, not more than 20 ft. high. The slopes of these hills near Gandi bear *Brachystegia oliveri*.

The Sokoke-Mangea-Arabuko area is the largest Muhuhu Forest on the coast. Between Mangea and the Crown Forest there is some Brachystegia savanna. The Muhuhu reaches its best development on the deep red soil of the Arabuko ridge. Here the trees grow to about 70 ft. and are mixed with *Mimusops sulcata, Memecylon gilgianum, Combretum schumannii, Cistanthera parvifolia, Oldfieldia* sp., *Maba* sp., and *Canthium schimperianum*. Trees and bushes of the understorey are *Encephalartos hildebrandtii, Erythroxylum emarginatum* (rare), *Ochna thomasiana, Eugenia* sp. (nr. *E. salacioides*), *Memecylon* sp., *Combretum illairii, Carpodiptera africana, Grewia plagiophylla, Phyllanthus reticulatus, Croton pseudopulchellus* (very common), *Teclea trichocarpa, Toddaliopsis sansibarensis* and *Strychnos* sp. (nr. *S. pauciflora*).

Elsewhere in the forest the Muhuhu is mixed to a greater or less extent with *Cynometra webberi*. In very dry or rocky areas the latter species may be almost pure, as on the lower slopes of Mangea Mountain and along the Mangea road from Kakoneni. The Cynometra may in such areas be as small as 15 ft. though it can grow to 40 ft. in wetter places.

Except for scattered trees in Mailuganji Forest and along the lower slopes of the Shimba Hills there is no Muhuhu until south of the Marenji Forest. There is an area of red soil near the Kwale road which probably grew Muhuhu at one period but there is no trace left.

Gonja Forest is on rather sandy soil and the only other tree which is at all common is Mkulu (Swa), *Diospyros* sp. The ground-flora is chiefly *Croton pseudopulchellus*. The best Muhuhu has probably been cut out in the past but there is a fair amount of regeneration.

The bush country to Voi is too dry for Muhuhu but I have seen an odd specimen on the middle slopes of Kasigau. Possibly trees occur or occurred on the slopes of many of the Teita Hills. On the Bura ridge between Mwatate and Bura stations small Muhuhu occurred. This was mixed with scrub species and some Ebony. Most of the accessible trees have been cut out for railway fuel but an area towards Mwatate, which has a strong undergrowth of Sansevieria, is uncut.

9. **Savanna Woodland.**—(*a*) *Mrihi* (*Brachystegia oliveri*) *savanna*.—This very distinctive sub-formation occurs on loose and rather sterile sand. It occurs in somewhat localised patches on the eastern side of the Arabuko-Sokoke forested ridge and continues south of Sokoke and

probably represent half the tree growth and Acacias a quarter. *Acacia mellifera, A. pennata* and *A. seyal* are present, but I should not be surprised if ten species occur. Other trees and shrubs are *Combretum* spp., *Thespesia danis, Grewia holstii, G. bicolor* and *G. plagiophylla, Sterculia triphaca, Dobera roxburghii, Sapium madagascariense, Diospyros vaughaniae, Carissa edulis, Cassia singueana, Bauhinia parvifolia, Entada sudanica, Albizzia anthelmintica, Allophylus alnifolius, Sansevieria* sp., *Euphorbia tirucalli,* and *Lannea alata.*

(*b*) *Flora of the Plains Soils.*—With diminishing rainfall the bush becomes lighter and these soils are characterised by the presence of Commiphoras and Acacias. *Acacia bussei, A. orfota, Commiphora* sp. (nr. *C. campestris*), *C. holosericea,* and *C. pilosa* are common. The Commiphoras if not the Acacias occur also in the Sandy Red-earth Scrub. The open Serengetti plains between Bura and Taveta are included in this type, though investigation might well show that they form a type of their own.

Notable trees which occur are *Delonix elata* and the Mahogany, *Melia volkensii.* Most of the bushes and trees listed under the other trees and shrubs of the red earth flora occur, but the Capparids are well represented. *Thylachium africanum* and *Cadaba adenotricha* are not uncommon. Other plants are *Diricletia pubescens* and *D. glaucescens, Hymenodictyon parvifolium, Sesamothamnus smithii, Balanites pedicellaris, Erythrina burttii* (rare), *Cassia abbreviata, Lycium persicum, Cordia gharaf, Cordia ovalis, Vepris redacta, Piptadenia hildebrandtii* (riparian), *Synadenium* sp., odd Baobabs, *Boswellia elegans, Lannea alata* and *Terminalia orbicularis.*

SECONDARY WOODLAND.

11. **Secondary Scrub on Coastal Sands.**—The original flora of the Magarini series has been preserved in only a few places. The red Muhuhu soils and the sterile Mrihi sands have largely preserved their flora intact, but otherwise the land has been cultivated, off and on, for centuries, I imagine. The abolition of slave holding in the latter part of last century caused a great deal of cultivation to be abandoned, but much of this is now being re-cultivated. Areas which do not appear to have ever been cultivated are Ganda, Buda, Gogoni, and Muhaka Forests, Gongoni Hill (near Mtwapa), parts of the Arabuko Sokoke forest near Tezo and Mida, the arid stretch between Mambrui (Gongoni) and the Tana, and the Witu Forests. The reasons for the preservation are somewhat doubtful; probably sanctity played a large part.

The secondary growth is really composed of several kinds. The soil drainage and the rainfall are prime factors and fire also plays a part in many districts. Where drainage is good and the rainfall about 30 to 40 inches a dense bush growth results (1): *e.g.* between Kilifi and Roka and

coriacea and hygrophilous trees such as *Syzygium guineense*, *Harungana madagascariensis* and *Antidesma venosum*. Owing to deforestation, grass fires and the distribution of Dum Palm fruits by man and elephant, *Hyphaene coriacea* is now much more widely spread. It is only in the best drained areas that high forest is beginning to come in again. The trees which make this type distinctive are *Albizzia glabrescens, A. versicolor, A. sassa, Clorophora excelsa, Erythropleum guineense, Pachystela brevipes* and *Parkia filicoidea*. These trees are naturally very scattered. Of the smaller trees *Vitex cuneata* is distinctive. *Elaeis guineensis* and *Raphia ruffia* in wetter parts are almost confined to this part of the coast.

12. **Secondary Scrub on Coral Limestone.**—Coral limestone occurs as old reefs amongst the coastal sands. I know of no place where the original flora is extant, as although there is little soil the areas are cleared and cultivated (tobacco, cassava, etc.) from time to time. In the resting seasons a dense shrubby mass results. I have not investigated the constitutent species sufficiently to differentiate this scrub from that on the adjacent sandy soils.

Bauhinia taitensis *Taub.* and B. wituensis *Harms* appear to be forms of *B. tomentosa* (p. 62). The latter has been recorded from Leroki (6,000 ft.) and Witu, where it is a bush to 20 ft. at the forest edges.

Bauhinia mombassae *Vatke* is distinct. Leaves rather large and tapering with 3 nerves in each.

Berchemia discolor *Hemsl.* (Rhamnaceae). Tree to 30 ft. Dry Bush. Voi District 2,500 ft.

Bersama volkensii *Gürke.* Small tree N. and W. Mt. Kenya, 5,000 ft.

Blighia sp. (Sapindaceae). Mwakamwaka (Swa.); Mpwakapwaka (Dig.). Small, usually one-stemmed tree to 40 ft. in low forest. Small inflorescences in axils of fallen leaves on older wood. Fruits edible. Digo forests, S. of Mombasa.

Bombax rhodophagnalon (p. 43) should read Bombax rhodognaphalon *K. Schum.*

Borassus sp. nr. *B. flabellifer* (p. 172) should read Borassus flabellifer *Linn.* var. aethiopum *Warb.* Mugumo (Dur.); Mtappa (Swa. L.). Occurs near Witu.

Boscia salicifolia (p. 11). Occurs at Magadi, 3,500 ft.

Boswellia elegans *Engl.* (Connaraceae). Mtungu (Tei.). Spiny shrub to 12 ft. in *Commiphora* bush, Voi district.

Brachylaena hutchinsii (p. 150). Mvumvo (Dig.); Mshenzi (Swa. L.); Avud (Bon); Kipugupugu (Tei.). Occurs on the coast red soils discontinuously from the Tanganyika border to Italian Somaliland. It is also found on the lower Teita Hills on red soil at 3,500 ft., as well as in a discontinuous belt from Nairobi to Nyeri at 6,000 ft. It is also found in the Nile Valley, near Jinja in Uganda.

Brachystegia edulis should read B. oliveri *Taub.* (p. 63). Mjombo (Gir.).

Brayera anthelmintica should read Hagenia anthelmintica *J. F. Gmel.* (p. 58).

Bridelia micrantha (p. 47). Mdudu (Dig.). Occurs as a forest tree in Kakamega and on the Shimba Hills (coast), in former forest land on S. Mt. Kenya, and elsewhere as a riparian tree. It is doubtfully a savanna tree.

Buddleja powellii *Kraenzl.* (Loganiaceae). Ngurangura (Samb.). Mt. Kenya and Leroki. Doubtfully distinct from *B. polystachya.*

Byrsocarpus sp. nr. *B. viridis*=B. maximus *Bak.* (p. 113). Arabuko-Sokoke Forest, Coast.

Cadaba apiculata (p. 11). Olokii (Mas.). Narok.

Cadaba farinosa (p. 11). Msimaguare (Tei.).

Cadia purpurea *Ait.* (Papilionaceae). Leroki, 5,000-6,000 ft. Erect shrub. Leaves imparipinnate. Corolla red.

Caesalpinia crista *L.* (p. 60). Mkete (Swa.L.). Nairobi, Mt. Kenya.

Caesalpinia sp. Spreading buttressed and somewhat corrugated tree in gully at Mwachi, 500 ft. Coast. Bark smooth and grey. Leaves like a *Brachystegia.* Corolla bright yellow with brown spots on posterior petal, and with rusty brown hairs on outside.

Calotropis procera *Ait.* (Asclepiadaceae). Mufuthu (Kamb.). Tree to 15 ft. Large silvery leaves 8 in. long. Kitui, 2,500 ft.

Calpurnia aurea *Benth. sic.* (p. 82).

Canthium dyscriton *sic* (p. 141). Also on Mt. Kasigau. Flowers in axillary small fascicles.

Canthium pseudoverticillatus *S. Moore.* Shrub to 10 ft. in dry forest Sokoke, Coast.

Canthium siebenlistii (*K. Krause*) *Bullock.* Tree to 20 ft. in forest undergrowth. Roka, Coast.

Canthium sp. nr. *C. lactescens* (p. 142)=C. lactescens *Hiern.* Leroki.

Carissa edulis (p. 131). Mulimuli (Bon.); Kirumba (Tei.).

Carpodiptera africana (p. 38). Melange (Bon); Mwanga (Swa.L.).

Cassia goratensis (p. 61)=C. singueana *Del.*

Cassia longiracemosa *Vatke.* Mwenu, Inyungi (Kamb.). Thin-stemmed scrambling bush, Tana R., 3,000 ft. Kitui Hills, 2,500-3,500 ft.

Caucanthus auriculatus (*Radlk.*) *Niedenzu* (Malpighiaceae). Leroki, 4,500—6,500 ft.

Caucanthus albidum *Nied.* Bush to 10 ft. Dry bush, Maungu, near Voi, 2,500 ft.

Celtis kraussiana *Bernh.* (p. 84). Mwessu (Tei.); Kirundu (Tav.).

Ceriops candolleana (p. 35)=C. tagal (*Perr.*) *C. B. Robinson.*

Chasalia sp. nr. C. afzelii (*Hiern*) *K. Schum.* Lusiliru (Meru). Bush in forest. Limuru and Meru.

Chasalia zanguebarica *Hiern.* Common forest undershrub on the Coast. Inflorescences white with purple tinge.

Croton pseudopulchellus *Pax* (p. 51). Barranad (Bor.). Common in *Brachylaena* coastal forests.

Cussonia sp. (p. 115)=C. zimmermannii *Harms.*

Cyathogyne sp. nr. C. bussei *Pax* (Euphorbiaceae). Mvunjajambe (Dig.). Small straggling undershrub to 5 ft. Coast.

Cylicodiscus battiscombei (p. 60). Mkunguni (Swa.); Mche (Swa.L.); Mbagazembe (Gir.). Wet coastal forests.

Cynometra sp. (p. 64)=C. sp. nr. C. suaheliensis (*Taub.*) *Bak. f.*

Dalbergia goetzei *Harms,* an unarmed species, is recorded from the Shimba Hills, 1,000 ft.

Dalbergia melanoxylon (p. 81). Is always a small tree. The climber, Kikwaju (Swa.) is *D. vaccinifolia* Vatke.

Dasycodon fratrum (*K. Krause*) *Bullock=Gardenia manganjae* Hiern (p. 139).

Delonix elata (p. 60). Is never ' a tall timber tree,' but a spreading tree 20-30 ft. high. Mwirangi (Tav.); Mrangi (Tei.).

Dialium orientale (p. 62). Omit Mpekechu (Swa.). Add Shishoble (Bon.).

Dichrostachys glomerata (p. 66). Dunguu (Tei.); Mubilisia (Kamb.); Msatiru (Bon.).

Diospyros mespiliformis (p. 119). Mumaweche (Dig.); Mnyongolo (Tav.). A small coastal tree, but at Taveta, 2,500 ft., a tall forest tree with a buttressed stem and a clean bole for 80 ft.

Diospyros vaughaniae (p. 119). Kijombo (Dur.); Mbati (Gir.). In dry bush along the Coast, and Voi District to 3,000 ft.

Diospyros sp. Mku (Swa.L.); Mkulu (Swa., Dig. & Gir.). Black-barked spreading tree with red wood. Characteristic of shale savanna and some bush at the Coast.

Discopodium penninervium (p. 158). Common, 8,000—10,000 ft.

Dombeya praetermissa *Dunkley* (p. 43). Merfured (Bon), Milange (Bon); Mwanga (Swa.L.). Common all along the coast.

Dracaena sp. Mronje (Dig.). Tree, chiefly riparian to 30 ft. and 6 in. in diam. C. white. Leaves 6 in. long. Fruits orange red ¾ in. diam. Common on coast.

Duranta plumieri Jacq. (p. 164)=D. repens *L.*

Drypetes major *Hutch.* (p. 48). Mfidjofidjo (Dig.); Mandama (Swa.L.); Kartadong (Bon.). Widely spread along the Coast.

Ekebergia rueppelliana (p. 104). Mbo, Manuka masi (Tei.); Mrongoleh (Bon.); Mpotowandovu mkuu (Swa.L.). Found in savanna N. of Lamu, Coast.

Elaeis guineensis *Jacq.* (Palmae). Mchikichi (Swa. ; Mposi (Tav.). Found in restricted localities, S. of the Ramisi R. and the Sabaki R. valley on the Coast and in the Taveta Forest, 2,500 ft.

Elaeodendron impressicostatum (p. 91). The tree referred to is *Ilex mitis.*

Elaeodendron schweinfurthianum *Loes.* Mukambwa keriniende (Boj.). Bush to 12 ft. on sand near sea. Lamu and Vanga.

Elaeodendron sp. (p. 91)=E. sp. nr. E. keniense *Loes.*

Encephalartos hildebrandtii (p. 1). Mkamwa (Swa.L.); Icheli (Bon.). Almost confined to *Brachylaena* forest on the Coast.

Entada gigas (p. 65)=E. phaseoloides (*L.*) *Merr.*

Entada sudanica (p. 65)=E. leptostachya *Harms.* Mnganyare (Baj.); Lershid (Bon.). Scrambling bush to 30 ft. Coastal dry bush country up to 2,500 ft.

Eranthemum hildebrandtii C.B. Cl. (p. 162)=Pseuderanthemum hildebrandtii *C.B. Cl.*

Erythrina burttii *Bak.f.* (p. 80). Recorded also from Mackinnon Road, 2,000 ft., and Nairobi, 5,600 ft.

Erythrina humei (p. 80) read Erythrina webberi *Bak.* Mdundungoma (Swa.L.); Mbemba koshi (Baj.); Burru (Bon.).

Erythroxylum emarginatum (p. 15). Mt. Kasigau, 3,500 ft.

Eugenia jambolana (p. 29)=Syzygium jambolanum *DC.* Common along the Coast.

Eugenia sp. nr. E. salacioides *Laws. (sic)* (p. 28).

Excoecaria venenifera Pax (p. 56)=Spirostachys venenifera *Pax*; Mtolotolo (Pok.). Occurs as a riparian tree at the back end of the Tana R. mangroves.

Fagara sp. nr. *F. macrophylla* Oliv. (p. 97)=Fagara macrophylla *Engl.* Also occurs on S. Mt. Kenya.

Lachnopylis floribunda (*Benth.*) *C.A. Sm.* (Loganiaceae). Mwirigaso (Tei.). Leroki and Teita, 4,000-6,000 ft. Tree to 70 ft. Flowers in spreading panicles.

Lachnopylis oppositifolia *Hochst.* Shrub. Kapenguria district, 4,500 ft.

Lannea alata (*Engl.*) *Engl.* (Anacardiaceae). Small bush with small pinnate leaves, whitish flowers and round fleshy edible fruits ½ in. long. Dry bush from the coast to 3,000 ft.

Lanugia (p. 134) = Lanuginia.

Lasianthus kilimandscharicus (p. 148). Fruit a porcelain blue berry.

Lasiodiscus sp. (Rhamnaceae). Shrub to 28 ft. covered with rusty brown hairs. Fls. white. Witu forests, Coast.

Lawsonia alba Lam. (p. 16) = L. inermis *L.*

Leptactina sp. (p. 137) = Leptactina platyphylla *Wern.*

Leptonychia sp. (Sterculiaceae). Tree of forest understorey. Digo forests, Coast.

Lippia ukambensis *Vatke.*

Lippia adoensis *Hochst.* Herb to 6 ft. Cherangani Hills, 7,000 ft.

Lovoa sp. (p. 105) = L. swynnertonii *Bak.f.*

Lycium persicum (p. 158). Serengetti Plains, 3,500 ft., between Voi and Taveta.

Maba abyssinica (p. 117). Mseseva (Tav.). Taveta Forest, 2,500 ft.

Maba dawei *Hutch.* Undershrub to 25 ft. in coast forests.

Maba quiloensis (p. 118) should read *Diospyros vaughaniae* (see p. 119).

Maba sp. (p. 118). Cancel 'now identified as *Maba abyssinica.*' This small tree to 30 ft. is quite distinct.

Macaranga kilimandsharica (p. 55). Dundu (Tei.); Mfirifiriwa kyagga (Tav.). Teita and Taveta forests.

Macaranga schweinfurthii *Pax.* Small tree in stream valleys. N. Kavirondo, 5,000 ft. Leaves simple, large and palmate.

Maerua angolensis *DC.* (p. 10). Luliondo (Samb.). S. Leroki, 6,000 ft.

Maerua grantii *Oliv.* Delicate shrub to 8 ft. A. white. W. Shimba Hills, 600 ft. Coast.

Markhamia zanzibarica *K. Schum.* Mkanga (Tei.); Mchawanda (Baj.). Also in scrub.

Melia volkensii *Gürke* (p. 104). Mukawe (Tav.); Mukurumbutu (Tei.).

Mimusops densiflora Engl. (p. 122) = Manilkara densiflora *Engl.* Mnago (Swa.). Common on shale lands at the Coast.

Mimusops cuneifolia Baker (p. 123) = Manilkara cuneifolia (*Bak.*) *Dubard* Mngambo (Swa.). Usually a forest tree.

Mimusops ugandensis *Stapf.* Tall timber tree on Shimba Hills, 1,000 ft., Coast.

Mimusops usambarensis (p. 121). Moruba (Tav.).

Monodora veithii (p. 6). Mcherere (Gir.). In drier areas at Coast. K. 3 green, small, C. 3 + 3.

Morus lactea (*Sim*) *Mildbr.* (Moraceae). Manuku (Kak.). Large forest tree of the Kakamega forests, 5,500 ft. Timber butter yellow.

Mundulea suberosa Benth. (p. 76) = M. sericea (*Willd.*) *Greenway.* Sea level to 1,500 ft.

Myrica salicifolia *Hochst.* ex *A. Rich.* (Myricaceae). Chebiakwai (Cher.). Cherangani Hills.

Myrothamnus flabellifolia *Welw.* (Myrothamnaceae). Low shrub to 1 ft. on exposed rocky ground. S. Leroki, 6,000 ft.

Nectaropetalum kaessneri *Engl.* (Linaceae). Mfunda mweupe (Swa.). Tree to 20 ft. Mwachi and N. W. Arabuko, Coast.

Nidorella vernonioides *Sch. Bip.* ex *A. Rich.* (Compositae). Common herbaceous shrub to 15 ft. 7,000-9,000 ft.

Notobuxus obtusifoliata *Mildbr.* (Buxaceae). Mdhahabu (Swa. Gir.); Masere (Gir.); Babala (San.). Shrub to 4 ft. in dry Giriama forests and bush, Coast. Bark very corky.

Ochna stuhlmannii (p. 27) = O. ovata *F. Hoffm.*

Ocotea gardneri (p. 8) = O. viridis *Kosterm.*

Oldfieldia sp. (p. 47). Mbambara (Swa.) *sic*; Babara (Bon.); Mbauri (Swa.L.). Not a common tree. Appears in *Brachylaena* forest at Arabuko and occasionally in N. Giriama country and N. of Lamu in savanna, where it may have a bush form. It occurs as a large timber tree in the Witu and S. Digo forests. Inner bark very bitter.

Psychotria nairobensis (p. 147). Recorded from Arabuko forest, Coast.

Psychotria cristata Hiern (p. 147)=P. sp.

Psychotria cristata *Hiern.* A tall forest climber with somewhat fleshy leaves and inflorescences. Kakamega, 5,500 ft.

Psychotria albidocalyx *K. Schum.* Bush to 6 ft. in half shade of low forest or bush, N. Giriama, Coast.

Pycnocoma littoralis *Pax* (Euphorbiaceae). Mngambo mwitu (Swa.). Small tree to 15 ft. at edge of forest Gonja, S. Digo, Coast. Fruits large and angled.

Randia nilotica (p. 137). Kikonye (Bon.); Mtutu (Baj.); Mulului (Kamb.).

Randia fischeri (*K. Schum.*) *Bullock.* Mutendekula (Kamb.). Bush to 12 ft. Fls. tubular, erect, white with magenta markings on throat. Vatta Plateau and Bura (Teita), 4,000 ft.

Raphia monbuttorum *Drude* (Palmae). The assumed name of the riparian palm in Kakamega Forest, 5,500 ft., and on the Isiola R., N. Kenya.

Raphia ruffia *Mart.* Mwaale (Swa. & Tav.). Stems to 35 ft. Leaves to 50 ft. Swampy stream bottoms in S. Digo and Taveta.

Rauwolfia (p. 132)=Rauvolfia.

Rauvolfia sp. Mbaribari (Tav.). Tree to 80 ft. in wet forest at Taveta, 2,500 ft. Also on the Manolo River, near Mombasa.

Rauvolfia mombasiana *Stapf.* Shrub to 15 ft. on coral soil, Mombasa. Fls. small, white.

Raphanistrocarpus boivinii (*sic*) (p. 26). Msuaki wa baniyani (Swa.L.). Common Coast bush. Twigs can be used as tooth brushes.

Rhus glaucescens A. Rich. (p. 110)=R. natalensis *Bernh.*

Rhus villosa L.=R. incana *Mill.*

Rinorea elliptica (*Oliv.*) *Kuntze* (p. 13). Mshunduzi (Swa.). Witu forests, Coast.

Rinorea ilicifolia (*Welw.* & *Oliv.*) *Kuntze* (Violaceae). Mkurute (Swa.L.); Bullabulla (Bon.). Shrub in forest undergrowth, Witu. C. cream. Inflorescence 4 in. long.

Ritchiea albersii (p. 13). The coast plant (a small scrambling shrub) is *R. fragrans* R. Br.

Rytigynia sp. nr. R. loranthifolia (*K. Schum.*) *Robyns* (Rubiaceae). Bush to 12 ft. in scrub N.W. Arabuko, Coast.

Sapium madagascariense *Prain* (p. 56). Mguluari (Gir.). Common in dry bush. N. Giriama Coast.

Sapium mannianum Benth.=S. ellipticum *Pax.*

Sclerocarya caffra *Sond.* (p. 113). Spreading tree to 40 ft. Common in orchard savanna, Coast.

Scutia indica Brongn. (p. 95)=S. myrtina *Kurz.*

Senecio gardneri *Cotton* (p. 152). A very rare form has ray florets (var. *ligulatus*).

Senecio elgonensis *Th. Fries.* Leaves normally thick, but in shade as thin as those of *S. amblyphyllus.* The lamina tapers to join the winged petiole.

Senecio cheranganiensis *Cotton* & *Blakelock.* Branching acute. The dwarf form with obtuse branching is *S. dalei* Cotton & Blakelock.

Senecio amblyphyllus (p. 153). 10,000-11,500 ft. Leaves always thin. Leaf base cordate.

Senecio multicorymbosus *Klatt* (p. 153). Mukorombosho (Tei.). Teita Hills and Mt. Kasigau, 4,000 ft.

Sonneratia acida L. (p. 17) should read Sonneratia caseolaris *Engl.* First coloniser of rising mud banks.

Sorindeia obtusifoliolata *Engl.* (*sic*) (p. 112). Mlakungu (Swa.L.). A medium-sized tree not uncommon along the coast and at Taveta.

Spirostachys africana *Sond.* (Euphorbiaceae). Msarkana (Swa.). Tree to 25 ft. common just south of Mombasa near Mwachi and probably to be found scattered throughout coastal bush country with a 30-35 in. rainfall. Wood very fragrant.

Sterculia sp. (p. 41)=S. appendiculata *K. Schum.* Omit Dara (Bon.).

Strombosia grandifolia (p. 93). Mutianzuni (Kamb.). Kutui Hills.

Strychnos engleri *Gilg.* Branchy tree to 25 ft. Fls. white and 4-merous. Coast nr. Roka.

Struthiola thompsonii *Oliv.* (p. 17), *sic.*

Suaeda monoica *Forsk.* (p. 15). Muswia (Tav.); Mnyanywa (Pare); Mwinonye (Swa.L. & Pok.). Also occurs on a salt vlei at Taveta.

to 40 ft., of forest under-
common peduncle with

edge, Mida Coast.
E. Mt. Kenya.
ub is *T. trichocarpa*, the

i *Engl.* Scattered along

va punda (Swa.L.). Tree
ks horizontal branching.

ommiphora-Acacia bush,
pink when maturing.
wer Tana. Bark thorny

Arabuko in scrub.
nelling shrub to 6 ft. in
warty.
lge, S. Digo, Coast.
o ft. on the Teita Hills.
scrub, rainfall 30 in.,
nombassana.
tree in forest at Kwale,
lless in flower.
Nguga (Swa.L.). Witu

Coast.
Tomot (Bon.). Bush to
000 ft. Fls. yellow and

bogo (Tei.); Tabubirwa

urke.

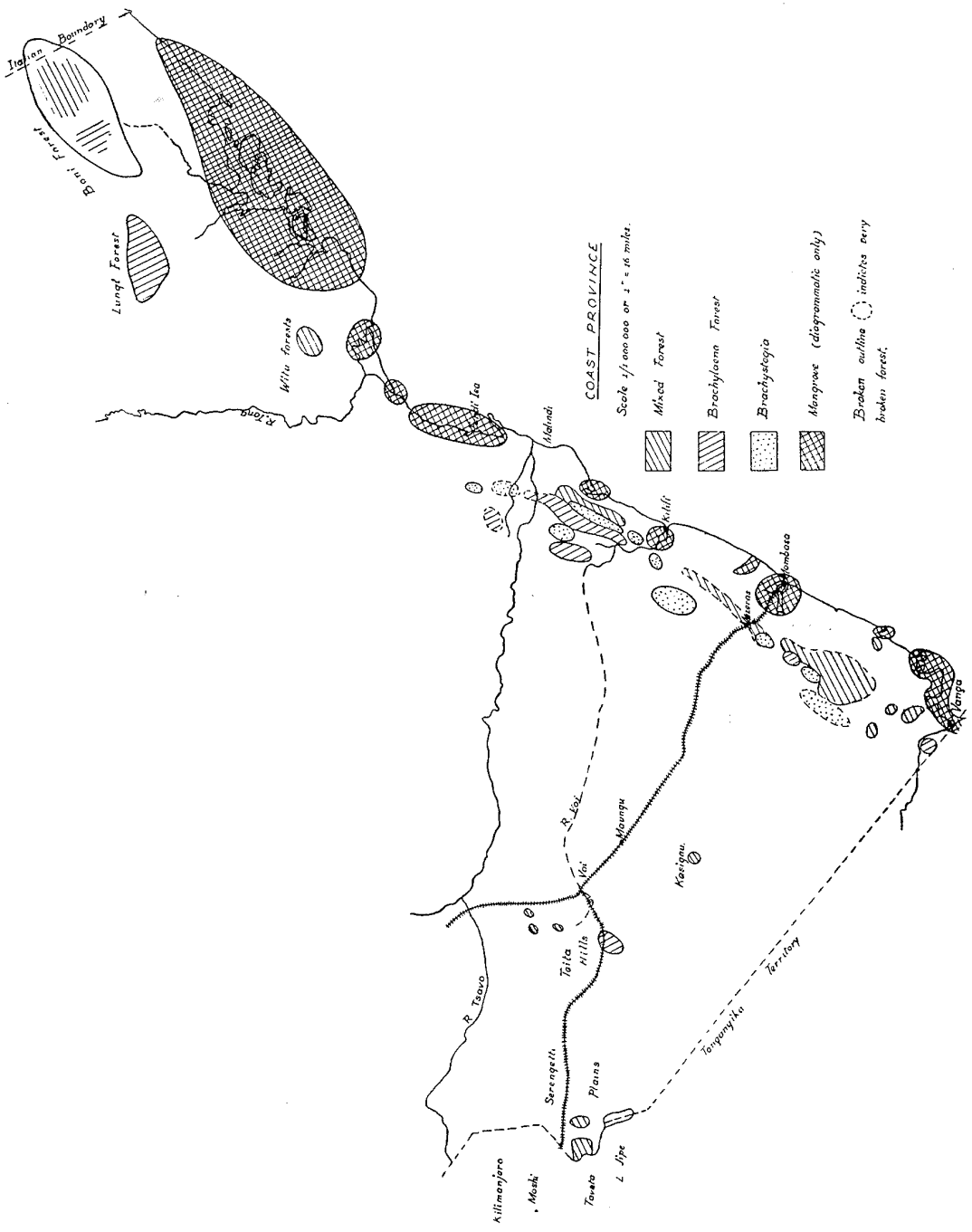
. Fls. $\frac{1}{2}$ in. long, red.

savanna, 5,500 ft., and

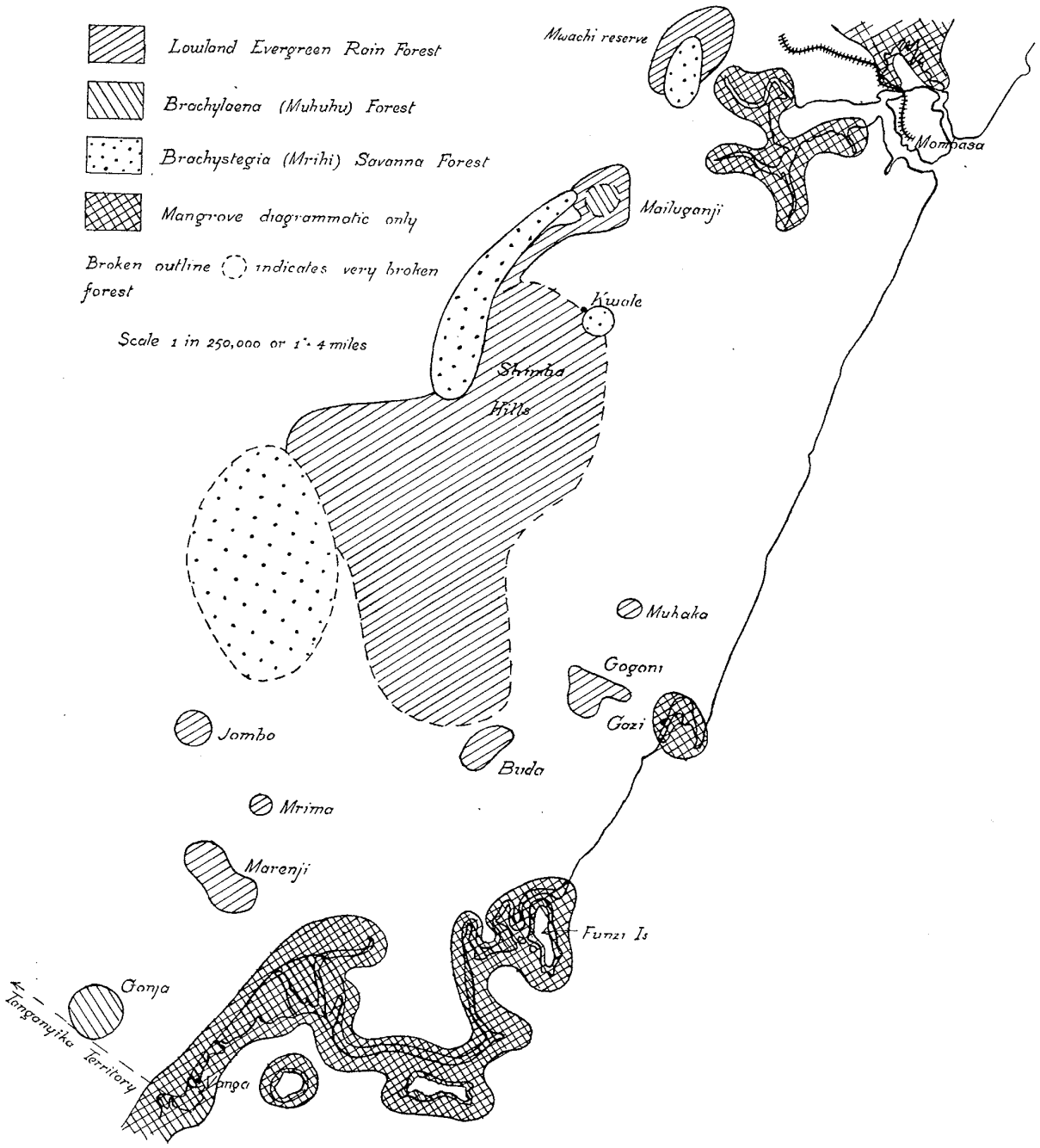
lirensis *Mattei*. Fruit

range. Leaflets acute.

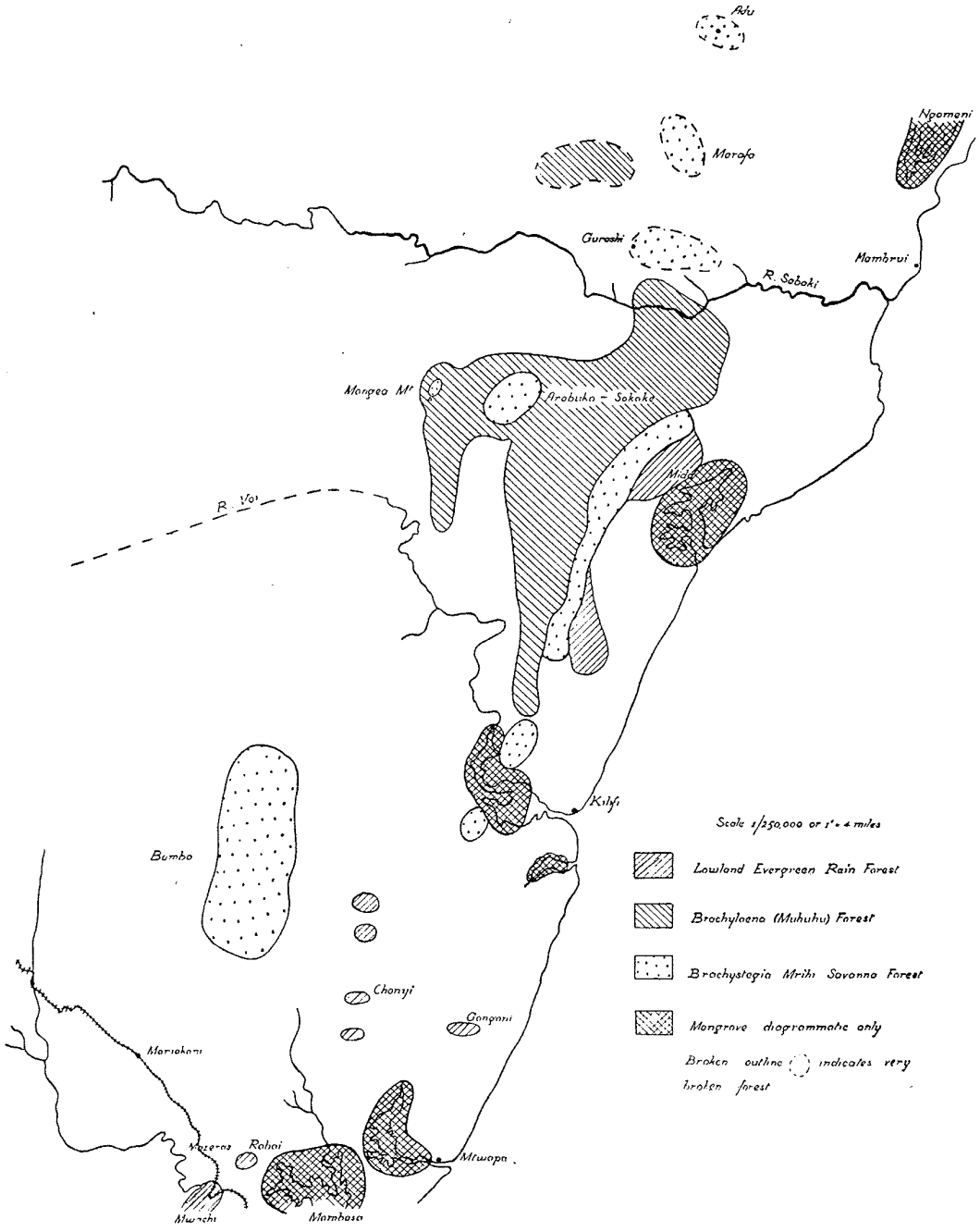
in *Hyphaene parvula*
Fruits black, splitting



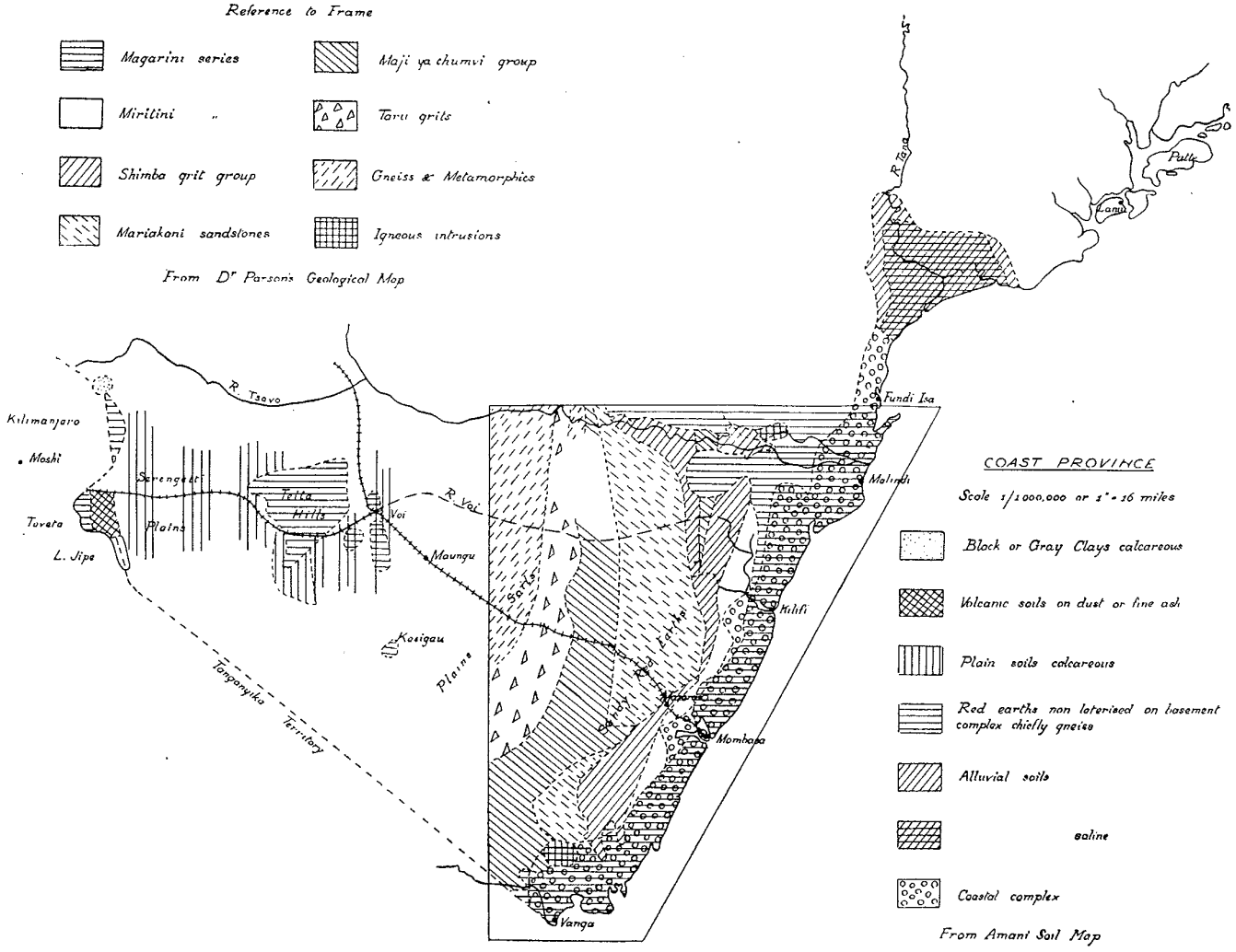
MAP 1. APPROXIMATE FOREST AREAS OF THE COAST PROVINCE.



MAP 2. APPROXIMATE FOREST AREAS BETWEEN TANGANYIKA TERRITORY AND MOMBASA.



MAP 3. APPROXIMATE FOREST AREAS BETWEEN MOMBASA AND NGOMENI.



MAP 4. SKETCH-MAP OF THE GEOLOGY (after Dr. Parsons).