

SUDAN GOVERNMENT

DEPARTMENT OF AGRICULTURE AND FORESTS

RESEARCH DIVISION

BULLETIN No. 1.

WAD MEDANI

JANUARY 1947.

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A. TREES AND SHRUBS

By

F. W. ANDREWS,

Chief Economic Botanist, Research Division,
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THE FLORA OF ERKOWIT

A. TREES AND SHRUBS

BY F. W. ANDREWS

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This pamphlet is the result of an attempt to make easy the identification of the common trees and shrubs of Erkowit. It is hoped in a later publication to provide a similar key to the flowering herbs.

It is intended that this key should be used in conjunction with Broun and Massey's *Flora of the Sudan* and also with Mrs. Crowfoot's *Flowering Plants of the Northern and Central Sudan*. The latter contains excellent illustrations of a number of Erkowit plants. Copies of these two books can be borrowed from the hotel.

The key should give the name of the tree or shrub and Broun and Massey will give more detailed and it is hoped confirmatory information about it.

Modern research on plant names has changed the names of some of the plants in Broun and Massey's *Flora*. The following changes which are incorporated in the key should therefore be noted :

NEW NAME	NAME IN BROUN AND MASSEY
<i>Pergularia tomentosa</i>	<i>Daemia cordata</i>
<i>Rhus incana</i>	<i>Rhus villosa</i>
* <i>Acacia tortilis</i>	<i>Acacia spirocarpa</i>
<i>Lachnophyllis appositifolia</i>	<i>Nuxia dentata</i>
<i>Lannea schimperi</i>	<i>Odina schimperi</i>
<i>Lannea barteri</i>	<i>Odina barteri</i>
<i>Heeria insignis</i>	<i>Rhus insignis</i>

*This *A. tortilis* is described in Broun and Massey under *A. tortilis* Hayne.

Blank pages are provided at the back of the pamphlet for recording field observations on the trees and shrubs of Erkowit. The author would be very grateful to receive any such field information for incorporation into our records. Any suggestions for improvement of the key would be welcomed.

The Erkowit plateau is bounded on the east and north sides by a steep escarpment dropping almost two thousand feet to the plains and the Red Sea. Its west and south sides merge into typical Red Sea Hill country. Jebels Nakeet and Es Sitt (Kitty's Leap) dropping steeply to Khor Dahand mark the northern extremity of the plateau. On the other side of this khor is a barren range of hills of which the highest peak is *Jebel Ungaibab. This range drops relatively steeply on the east to the Red Sea plain. On the south eastern side the escarpment drops steeply to Khor Wintree, on the other side of which are the heavily covered evergreen slopes of the Deeb range. Jebel Sela (4244 feet), the highest evergreen peak of the district lies in the eastern portion of the plateau. Jebel Erbab (5077 feet) is a barren peak lying to the south of the Erkowit plateau.

The principal rains occur in the winter, though light showers may also occur during the summer. During the winter the hills are almost continuously covered by mist (shabora) which blows up from the sea. A portion of the rain and mist blowing from the north-east meets no obstacle before impinging on the Erkowit escarpment and plateau. In consequence abundant evergreen vegetation is maintained in this area and on the sides of the escarpment. West of the plateau where the rain is caught by the intervening Red Sea hills, only sparse vegetation of a drought-resisting kind is able to survive. This distribution of rainfall with its effect on the vegetation is clearly seen from the top of Jebel Nakeet.

Principal Zones of Vegetation.

In consequence of this unequal distribution of available moisture the vegetation of the district can be divided into three principal zones :

1. An **Arid Zone** lying to the west and south of the plateau.
2. A **Transitional Zone** between 1. and 3. which lies roughly at the position of the old hotel and its surrounds.
3. A **Moist Zone** consisting of the eastern and north-eastern portion of the plateau.

1. Arid Zone.

This zone includes the bulk of the scenery on the western boundaries of Erkowit, and on the Sinkat road near Erkowit. It is dominated by *Euphorbia erythraeae* and *Dracaena ombet* with *Acacia etbaica* on the higher slopes and *Acacia tortilis* on the lower slopes and occasional *Balanites aegyptiaca* and *Ziziphus spina-christi* in the khors.

The under vegetation consists principally of *Euphorbia thi*, *Caraluma penicillata*, *Aloe abyssinica*, *Argemone mexicana*, *Withania somnifera*, *Barleria species*, *Blepharis maderaspatensis*, *Cassia obovata* etc. Under extremely arid conditions, viz. on jebel sides, often only sparsely distributed *Euphorbia erythraeae* and *Dracaena ombet* persist, the latter often occurring where even *Euphorbia erythraeae* is unhappy.

2. Transitional Zone.

This can be clearly seen when looking south from the top of the small hill to the north of the Governor's house. In this zone *Dracaena ombet* is extremely rare and is replaced in dominance by *Gymnosporia senegalensis* with more abundant *Acacia tortilis* while *Euphorbia erythraeae* maintains its dominance. As we proceed eastward, i.e. towards the Moist Zone, *Euphorbia erythraeae* is rapidly replaced by dominant *Euclea kellaui* and other Moist Zone trees and shrubs. In the walk to Jebel Yamerdermai, as around the old hotel, the dominant vegetation is *Euphorbia erythraeae* and *Gymnosporia senegalensis* with occasional *Acacia tortilis*, *Acacia ebaica* and *Diospyros mespiliformis* and *Balanites aegyptiaca* near the khors, which frequently contain large trees of *Zizyphus spinachristi*. *Ficus sycomorus* also occurs occasionally in the khors.

3. Moist Zone.

The moist zone lies east of the old hotel and includes the northern and eastern sides of the escarpment. *Gymnosporia senegalensis* and *Euclea kellaui* are dominant with frequent *Dodonea viscosa*, *Rhus incana*, *Carissa edulis*, *Diospyros mespiliformis*, *Phoenix sp.* and *Rhus abyssinica*, occasional *Ximonia americana*, *Ficus glumosa* var. *glaberrima*, *Lannea schimperi* and rare *Olea europaea* var. *nubica* except on Jebel Deeb where *Olea sp.* is much more abundant. In the wettest portion *Euphorbia erythraeae* and *Acacia species* are absent. The undergrowth consists principally of the shrub *Coleus barbatus* and various herbs. A few ferns occur in the shade of rocks. This type of vegetation is seen on Jebel Sitt, Maselli Pass, Kolkulai Pass and intervening country and Jebel Deeb range.

The above represent the principal divisions of the vegetation at Erkowit. There is of course no abrupt line of division between each zone but outliers of any particular zone push out into adjacent zones as localised climatic and topographical conditions make it possible.

The transitional zone is relatively narrow in width. Towards the moist zone in shallow valleys are small meadows with well grazed grass and abundant *Urginea micrantha*.

KEY TO THE TREES AND SHRUBS OF ERKOWIT

The plants of this region have been divided according to size and appearance into three main groups viz : trees, shrubs and herbs. These are defined as :—

- A. **Trees** — woody plants having a bare, thick, almost vertical main trunk with branches towards the top.
- B. **Shrubs** — woody plants smaller than trees although they may reach 8 feet in height, with branches almost from ground level ; this group includes all woody climbing plants.
- C. **Herbs** — Mostly green non-woody plants usually much smaller than shrubs ; may be brown and slightly woody at base.

There can, of course, be no distinct dividing line between shrubs and herbs, or even between trees and shrubs, as one will tend to grade into the other. If a plant is not found in its suspected class it may not be typical in its growth and other specimens of it should be looked for to see if they conform to the type of the first specimen. Leaves may vary in size, shape and colour according to age. It must be realized that the plants in Erkowit (except in the khors) are in general growing under a water strain, and where in other parts of the Sudan a plant would be a shapely tree, in Erkowit it may occur as a distorted rather tall shrub. Again, plants that occur as definite shrubs with thorns in the Arid and Transitional Zones may be found as small trees without thorns in the Moist Zone. An attempt has been made to provide in the key for this variability.

The only implement required is a fairly strong penknife and the only botanical knowledge is to be able to distinguish between a leaf and a leaflet. The attached diagram clearly indicates this difference.

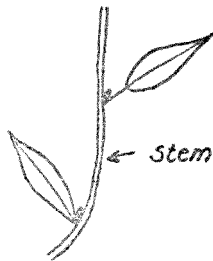
To name a plant, decide first to which group it belongs, i.e. whether it is a tree or shrub. Then look at the key under this group and note the characters given under 1 if it is a tree, or 33 if it is a shrub. If the specimen does not show the characters of 1 or 33 then look under 10 or 48. The second number in brackets at the beginning of a descriptive paragraph indicates where you can find characters contrary to those found at the first number.

Let us take an example : Suppose we saw a tree with no thorns or milky juice, but with clusters of long sword-shaped leaves at the ends of its branches. Looking at the key under Trees we should see that 1 (10) describes trees with thorns. Our tree has no thorns so we look under 10 and find it refers to trees without thorns and therefore must include our tree. Continuing, we note that the next paragraph 11 (17) says " Trees with a milky juice ". Our tree has no milky juice so we look under 17 which refers to trees without a milky juice and must include our tree. The next number after 17 is 18 (19)

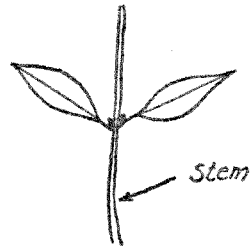
DIAGRAMS SHOWING LEAF CHARACTERS

LEAVES

(a) Arrangement



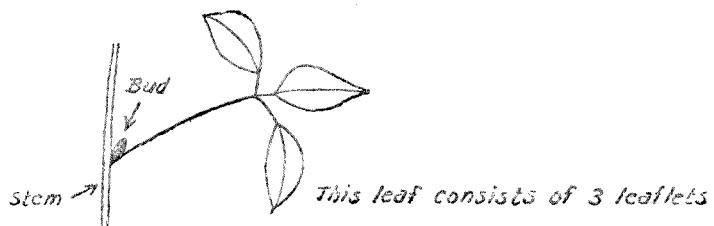
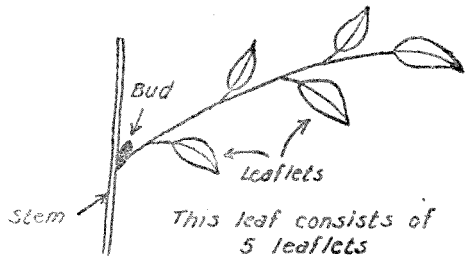
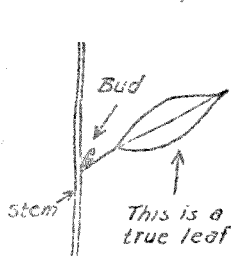
Leaves arranged alternately



Leaves arranged opposite to one another

(b) Division

To decide if a "leaf" is a true leaf or a leaflet look for the BUD at the base of the leaf stalk where it joins the stem



It is very important to decide if one is looking at a true leaf or a leaflet since part of the key is founded on this character. Sometimes the bud is small and difficult to see, but if the leaf stalk is pulled gently downwards from the stem, the bud usually becomes easily visible.

tand her ^o is described a tree with clusters of sword-shaped leaves at the ends of the branches. This would be the tree that we saw and is called *Dracaena ombet*. Even if the characters of a plant agree with those under a particular number it is always safer to look at the characters under the bracketed number in order to be quite sure that our observation is correct.

Unless preceded by "(Ar.)" to indicate Arabic, all names in the Key printed in capitals are Hadendowa.

TREES

1. (10) TREES WITH THORNS ON THE BRANCHES
2. (5) *Leaflets very many, very small*
3. (4) Thorns long, straight, white, abundant ; flowers white, arranged like Mimosa flowers *Acacia tortilis*
(Pl. IV Figs. 3 and 4) TOWAI
4. Thorns short, curved, brown, absent from some branches ; flowers white to yellow arranged like a bottle brush —
Acacia albida
(Pl. VI, Fig. 6) BATTOC. (Ar.) HARAZ
5. (9) *Leaves $\frac{1}{2}$ to $1\frac{1}{2}$ inches long*
6. (7) Thorns straight, younger ones green . . . *Balanites aegyptiaca* —
SHASHOT. (Ar.) HEGLIC
7. (8) Thorns short, straight, maroon on young branches —
Gymnosporia senegalensis
(Pl. VI Fig. 1.) DABALAB
8. Thorns in pairs, brown, one short, curved, one longer almost straight ; leaves with 3 prominent veins on back —
Ziziphus spina-christi
(Pl. VI Fig. 5) GARAT. (Ar.) SIDDIR, NEBBAK
9. *No leaves ; tree candelabra-shaped and having a copious milky juice* *Euphorbia erythraeae*
(Pl. III Figs. 1,2,3,4) UNKOWT
10. TREES WITHOUT THORNS ON THE BRANCHES

11. (17) *Trees with a milky juice ; shown by breaking leaf branches or stabbing trunk ; bark often smooth and grey.*
12. (13) *Leaves up to 5½ in. broad and 6 in. long, shaped like inverted heart Ficus glumosa*
TILT
13. (14) *Leaves up to 4 in. long and 2½ in. broad, oblong —*
Ficus glumosa var. glaberrima
SAMOK
14. (15) *Leaves up to 3½ in. long, often less, almost circular, often rough to the touch Ficus sycomorus*
(Ar.) GAMEIZ
15. (16) *Leaves up to 4 in. long and 1¼ in. broad, lance-shaped, the broadest portion being towards the top, edge wavy —*
Ficus dekekena
16. *Leaves up to 10 in. long and 8 in. broad, inverted heart-shaped ; leaf stalk up to 5 in. long Ficus vasta*
17. *Trees without a milky juice*
18. (19) *Palm-like tree bearing at end of branches dense clusters of sword-shaped leaves about 2 ft. long—*
(Pl. IV Figs. 1 and 2) *Dracaena ombet*
19. (20) *Not as above*
20. (21) *Trees leafless in dry season, looking as though burnt or struck by lightning, new leaves appearing about end of August. Leaves consisting of 5-11, usually 7, leaflets ; young shoots thickly brown downy ; wood under bark of main trunk salmon red*
It is very difficult to *Lannea barteri*
distinguish between these two *Lannea schimperi*
trees. It is doubtful whether they
are separate species. (Pl. VI Fig. 2) HAMADT
21. *Not as above ; trees evergreen*
22. (26) *Leaves arranged alternately*
23. (24) *Leaves up to 2 in. long, narrow lance-shaped, leathery, light green, dull, most leaves ending abruptly in a fine point Boscia angustifolia*

24. (25) Leaves about $1\frac{1}{2}$ in. long, rather egg-shaped, ending sometimes in a point, sometimes in a notch ; very prominent light coloured *single* midrib on under surface ; fruit shaped like a string of beads.....*Maerua angolensis*
25. Leaves 2-6 in. long, rather broad lance-shaped, somewhat shiny on upper surface, bright green, sometimes covered with hemispherical warts, veins on under surface indistinct; young leaves reddish ; bark black ..*Diospyros mespiliiformis*
(Pl. VI Figs. 3 and 4) AREEAB. (Ar.) GUGHAN
26. (30) Leaves arranged opposite to one another (or several, i.e. 3 or more in a cluster)
27. (28) Leaves up to 3 in. long, lance-shaped, rather shiny on upper surface, edge of leaf with blunt teeth ; often several in a cluster ; flowers clustered at ends of branches ; trees willow-like, generally lining banks of gullies (khors)
(Pl. V. Fig. 2) *Lachnopylis oppositifolia*,
28. (29) Leaves up to 2 in. long, round oblong or lance-shaped, often brownish white scaly beneath ; young leaves lighter green than old ones ; gnarled tree with congested branches
Olea europea var. nubica
(Pl. V Figs. 3 and 4) DADAA
29. Leaves and flowers clustered at ends of branches ; leaves up to 3 in. long, narrow lance-shaped, upper surface lighter green ; flowers many in a cluster, each flower about $\frac{3}{4}$ in. long, yellow ; stem of plant light grey, bark peeling easily *Pavetta hochstetteri*
30. Leaves often arranged in threes, joined at the same point of the stem
31. (32) Leaves about 3 in. long, oblong to egg-shaped pointed at both ends, often shiny on upper surface ; fruit with 4-5 wings —
Combretum sp. probably Combretum ghasalense
32. Leaves long, narrow, closely hairy on both surfaces with, on under surface, numerous parallel veins forming angle of about 80° with midrib ; generally occurs near water.....
Heeria insignis

SHRUBS

33. (48) SHRUBS WITH THORNS OR PRICKLES ON THE BRANCHES
34. (37) *Shrubs with milky juice in stem and/or leaves*
35. (36) No leaves ; spines curved, thick, on very thick greenish stems (Pl. V Fig. 1) *Euphorbia thi*
36. Leaves oval ending in a point ; spines up to 1 in., straight, green, often brown tipped ; milky juice seen by tearing fresh leaf in half while attached to stem or pulling leaf from stem(Erkowit Lilac) *Carissa edulis*

ERNAB

37. *Shrubs with no milky juice*
38. (42) Climbing plants, all prickly
39. (40) Leaves up to $\frac{3}{4}$ -1 in. long, pin-shaped ; 2-6 in cluster round stem *Asparagus racemosus*
40. (41) Leaves $\frac{1}{2}$ in. long, pin-shaped, 6 to 15 in a cluster round stem *Asparagus asiatica*
41. Leaves about 2 in. long, oblong, ellipse-shaped ; prickles in pairs, one on either side of leaf stalk —

Capparis persicifolia

42. Plants not climbing
43. (44) Leaves up to 1 in. long, pin-shaped, densely clustered round prickly stem *Asparagus africanus*
44. (45) Leaflets many extremely small ; spines up to 1 in. long, white ; extremities of young branches often red-brown —

Acacia eibaica

ARRAD

45. (46) Leaves about 1 in. long, pointed or rounded at the end, rather thick, leathery, light green, dull, veins on under surface hardly distinguishable ; spines thin, maroon on young branches *Gymnosporia senegalensis*

DABALAB

46. (47) Leaves 1-2 in. long, oval ; spines short, rather thick, not maroon ; fruit like a small damson, edible, yellow *Ximenia americana*

ALHASAB

47. Leaves up to 5 in. long, oval, with undulating edge ; leaves and stem grey-brown, very woolly ; veins of under surface of leaf very prominent and of lighter colour than remainder of leaf ; thorns very short, straight ; flowers purple or white ; fruit like a yellow " cherry " tomato...
Solanum incanum

48. SHRUBS WITH NO THORNS OR PRICKLES ON BRANCHES

49. (58) *Climbing plants*

50. (52) Plants having a milky juice

51. Leaves up to 1 in. long arranged opposite to one another ; seeds with tuft at one end of large white silky hairs —
Pergularia tomentosa

52. Plants not having a milky juice

53. (54) Leaflets 3-5, softly grey downy, with saw-like margins ; stem with many thread-like tendrils used for climbing ; flowers small, yellow-green *Cissus cyphopetala*

54. (55) Leaflets 3-5, up to 1½ in. long, rather broad lance-shaped, the end leaflet much larger than the others ; not hairy, green ; margin of leaflet not saw-like ; no tendrils present ; flowers white pink-tinged, sweet smelling —
Jasminum officinale

55. (56) As above but leaflets mealy whitish..
Jasminum mauritianum

56. (57) As *Jasminum officinale* but plant hairy, leaves shiny —
Jasminum steudneri

57. Leaflets 3-7, oval, often silky beneath, edged with rounded teeth ; no tendrils present ; fruits covered with long silky hairs (Old Man's Beard) ; often in May covering tops of trees around which it grows .. *Clematis thunbergii*
(Not in Broun and Massey)

SUEE

58. *Plants not climbing*

59. (63) Plants with milky juice

60. (61) Leaves large *Calatropis procera*
(Ar.) USHUR
61. (62) No leaves ; switch-like plant with small yellow flowers ;
sometimes appears to climb *Sarcostemma viminalis*
62. Leaves $\frac{1}{2}$ -1 in. long, sometimes wedge-shaped, scattered
tufted ; branches horizontal *Euphorbia cuneata*
63. Plants with no milky juice
64. (66) No leaves
65. Leafless ; stems branching from ground level, 4-angled,
each side up to 2 in. broad, green ; when cut or broken
stems emit copious watery sticky juice..
Caralluma penicillata
(Not in Broun and Massey)
66. (67) Leaves like a date palm *Phoenix sp.*
SALEET
67. Not as above
68. (83) Leaves arranged alternately
69. (79) Leaves *not* divided into leaflets.
70. (71) Leaves 1-4 in. long ; egg to lance-shaped, **not** hairy, **not**
saw-edged ; flowers small, inconspicuous ; fruit 3-4 lobed,
 $\frac{1}{2}$ in. in diameter *Phyllanthus discoideus*
71. (72) Leaves up to 4 in. long, but usually much smaller, oval,
often abruptly wedge-shaped, saw-edged, having golden
coloured dots on under surface *Acalypha fruticosa*
72. (73) Leaves up to $1\frac{1}{2}$ in. long, triangular to egg-shaped, very
thick, leathery, blue-green, toothed edges, **not** hairy —
Gymnosporia luteola
73. (74) Leaves up to $2\frac{1}{2}$ in. long, oval, pointed, stem and under
surface of leaves covered with short, close, woolly hairs ;
fruit first green, then yellow, finally red, like a very
small tomato. enclosed in a much larger brownish papery
covering *Withania somnifera*

NAKEE-ENEES

74. (75) Leaves up to 2½ in. long, lance-shaped, glossy on upper surface, pale green, with many close parallel veins at angle of 45° to 50° to midrib of under surface ; fruit with 3-4 membranous wings .. (Erkowitz Privet) *Dodonea viscosa*

TATTAS

75. (76) Leaves about 1¼ in. long, rounded, with a wavy outline, 3-5 prominent veins leading from base of the leaf on under surface *Grewia erythraea*

76. (77) Leaves up to 2 in. long, egg-shaped, rough to the touch, saw-edged, upper and lower surface of leaf often covered with raised dots ; young shoots often reddish downy —

Grewia ferruginea

77. (78) Leaves up to 8 in. long and 6 in. broad, usually somewhat less, oval, unequal at base, edge of leaf *not* toothed ; leaf stalks and branchlets densely and softly hairy ; flowers large, trumpet-shaped, white ; fruit up to 1½ in in diameter, spherical, prickly ; seeds flat, brown, shaped like a miniature human ear *Datura metel.*

(Ar.) SAKARAN

78. (79) As above but leaves toothed ; leaf stalk and branchlets *not* hairy ; fruit egg-shaped ; seed small, black.

Datura stramonium

(Ar.) SAKARAN

79. Leaves divided into 3 leaflets joined at same point on leaf stem

80. (81) Leaflets up to 1 in. long, often inverted pear-shaped, hairy on both surfaces of leaf ; young shoots rather brown hairy *Rhus incana*

SAMOP

81. (82) Leaflets up to 3 in. long, broad lance-shaped, only very slightly hairy *Rhus abyssinica*

HALEE SAMOP

82. Leaflets up to 3 in. long, lance-shaped, pointed at both ends ; under surface of leaf covered with numerous dots which may be transparent when leaf is held up to light —

Teclea nobilis

83. Leaves arranged in pairs, one leaf opposite the other

84. (88) Leaves in pairs, one pair being at right angles to the direction of the pair immediately above or below ; stems and flower-stalks often 4-sided, not round ; crushed leaves often having a strong scent

85. (86) Leaves up to 4 in. long, oval or oblong, rather thick, very hairy ; veins of under surface raised and of lighter colour than remainder of leaf ; flowers bright blue —

Coleus barbatus

KALEEA

86. (87) Leaves very small, thick, oblong with a wavy edge, white hairy beneath ; shrub hairy ; flowers white ..

Otostegia tomentosa

87. Leaves 1-2 in. long, triangular with wavy edge ; shrub and leaves hairy ; flowers white *Otostegia repanda*

88. Leaves arranged in pairs but not as above ; crushed leaves not scented

89. (90) Leaves 1-2 in. long, lance-shaped, rather thick, leathery smooth, dark green on upper surface, light green underneath ; veins on under surface darker green than remainder of under surface ; flower white, heathlike . . *Euclea kellau*

GWIM

90. (91) Leaves up to 2½ in. long, oval, pointed, stem and under surface of leaves covered with short close woolly hairs fruit first green then yellow, finally red, like a very small tomato, enclosed in a much larger brownish paper covering *Withania somnifera*

NAKEE-ENEES

91. (92) Leaves up to 8 in. long and 6 in. broad, usually somewhat less, oval, unequal at base ; edge of leaf *not* toothed ; leaf stalks and branchlets densely and softly hairy ; flowers large, trumpet-shaped, white ; fruit up to 1½ in. in diameter, spherical, prickly ; seed flat, brown, shaped like miniature human ear *Datura metel*

(Ar.) SAKARAN

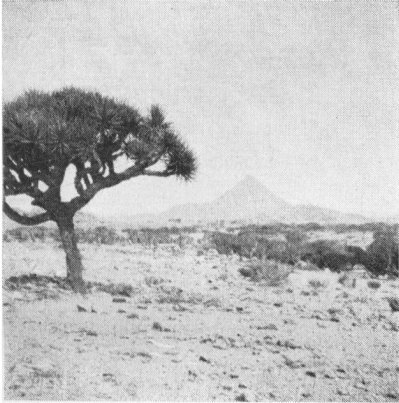
92. As above but leaves are toothed ; leaf stalk and branchlets *not* hairy, fruit egg-shaped ; seed small, black—

Datura stramonium

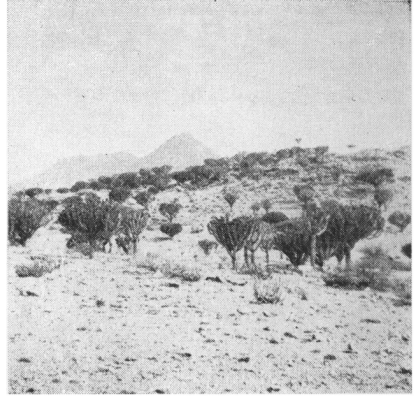
(Ar.) SAKARAN

PLATE I.

ARID ZONE.
(near Khor Amat).



Draceana ombet on left, *Euphorbia erythraeae* and *Acacia tortilis* on lower slopes.



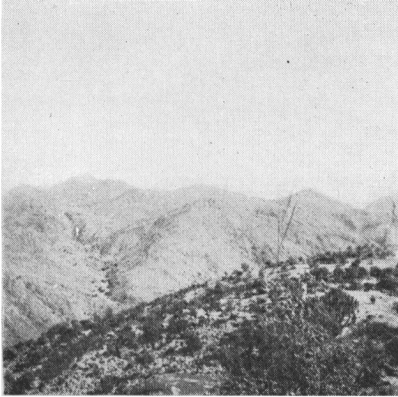
Dominant *Euphorbia erythraeae* with *Euphorbia thi* and *Acacia etbaica*; *Caralluma penicillata* in foreground.



Draceana ombet on left, *Euphorbia erythraeae* and *Acacia etbaica* on right, *Acacia tortilis* in top background.

PLATE II.

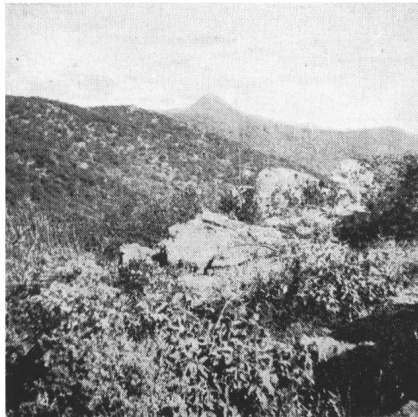
TRANSITIONAL ZONE.



Looking W.N.W. from G. Yamergermai. Note extreme barrenness (except khors) when compared with G. Yamergermai and transitional zone (foreground).



Looking N.E. from G. Yamergermai towards G. Nakeit; separated by Khor Dahand from barren hills on left.



Looking N.W. from Hunka rock towards G. Sela in the distance. *Rhus abyssinica* in immediate foreground.

PLATE III.

Four Types of *Euphorbia erythraeae* N.E. Br.

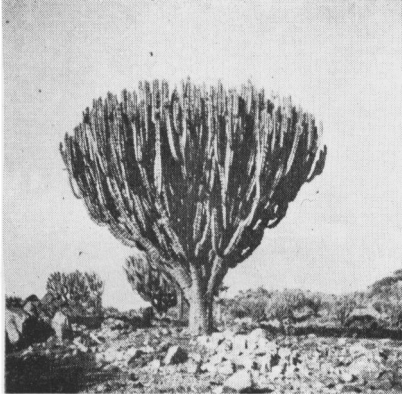


Fig. 1.

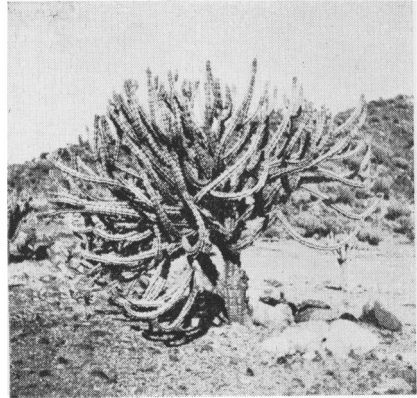


Fig. 2.

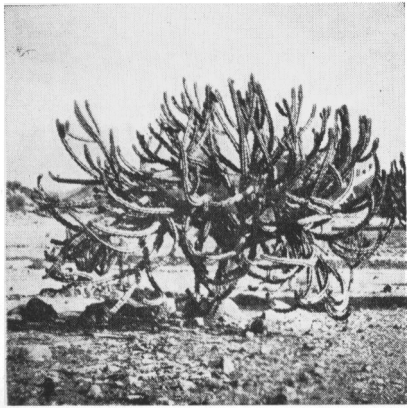


Fig. 3.

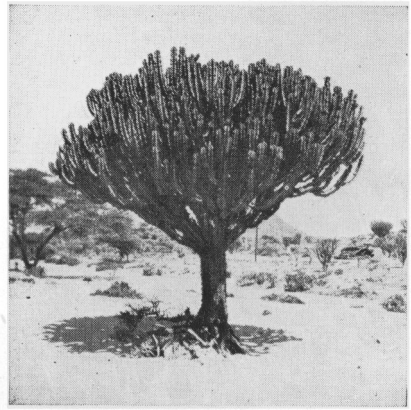


Fig. 4.

PLATE IV.

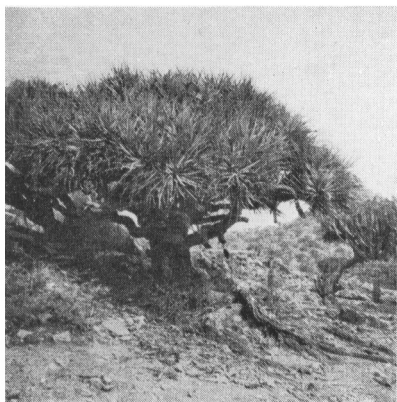


Fig. 1.

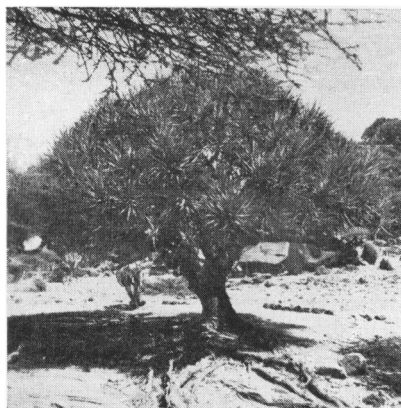


Fig. 2.

Dracaena Ombet Kotschy and Peyr.

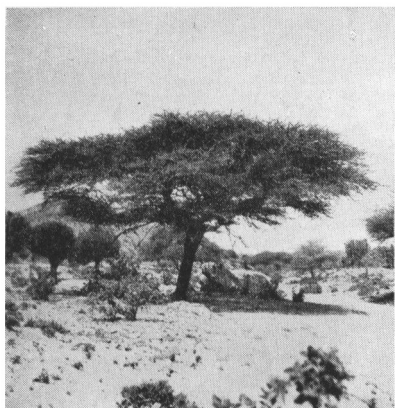


Fig. 3.

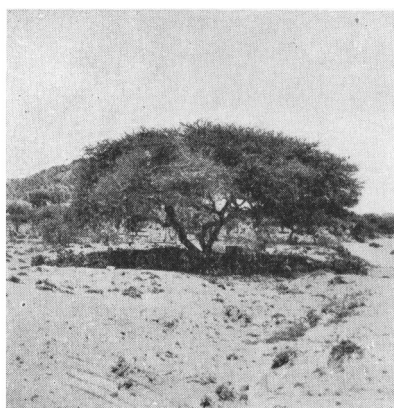


Fig. 4.

Acacia tortilis Christensen.

PLATE V.

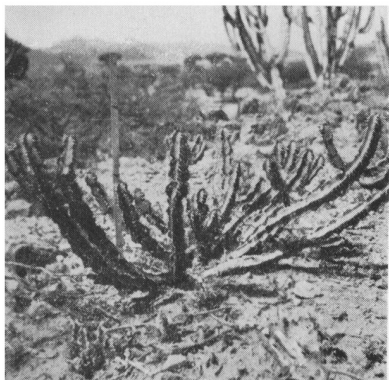


Fig. 1.
Euphorbia thii Schweinf. Note 2 ft.
rule.



Fig. 2.
Lachnophyllis oppositifolius Hochst in
Khor Kolkolai.

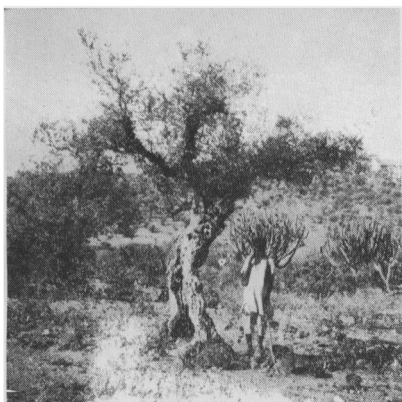


Fig. 3.
Olea Europaea L. var *Nubica* Schweinf.
The Erkowit Olive tree: Note gnarled twisted trunk and congested branches.

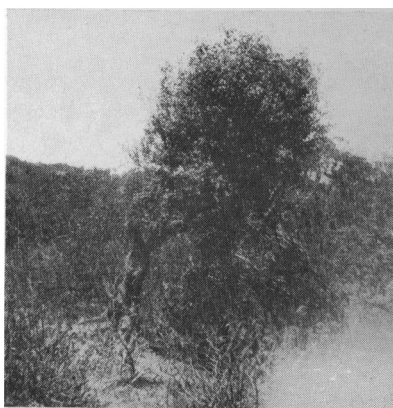


Fig. 4.

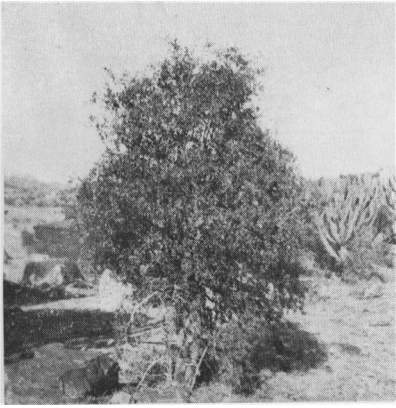


Fig. 1.
Gymnosporia senegalensis (Lam) Loes.
The thorny shrub type.

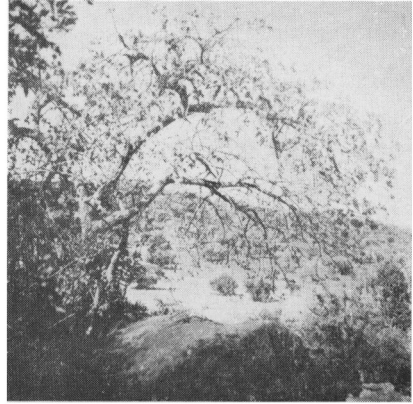


Fig. 2.
Launca schimperi (Hochst) Engl.
Photograph taken end of August:
note leaves emerging from buds.



Fig. 3.
Diospyros Mespiliformis Hochst.
Note thick black trunk,

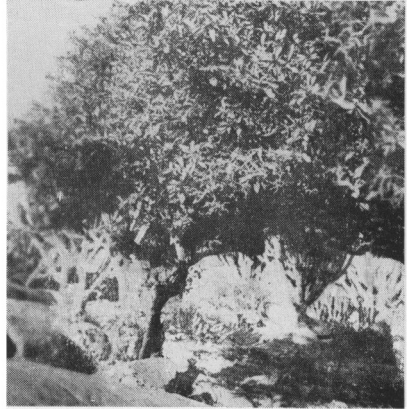


Fig. 4.



Fig. 5.
Zizyphus spina christi Willd. Large
tree in Khor Harasab.

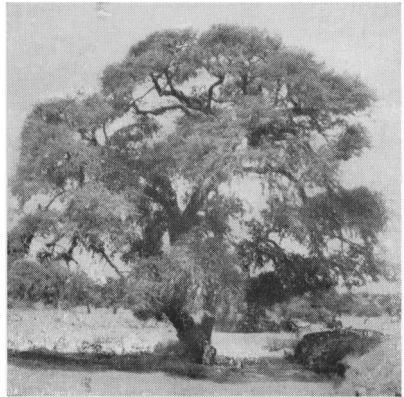


Fig. 6.
Acacia sp. of *A. albida* Del. Very large
tree near the mosque. Probably the
largest tree in Erkowit and District.

NOTES.
