A WINTER FLORA OF CHERAT HILLS

by

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Part II

Family : *EUPHORBIACEAE*

Tribe : *EUPHORBIEAE*

104. E. hirta, Linn.

A small herb of shady and wet places commonly found in waste places, fields & along the banks of streams.

105. E. thymifolia, Burm.

A small prostrate herb of both exposed and shady places, abundant in shady wet places, found at Dag, Chapri and Cherat; more common on southern aspects ascending upto an altitude of 4200 ft.

106. E. hispida, Boiss.

A small prostrate herb of exposed places commonly found on dry southern aspect in association with the former species. as a whole very occasional; not found on the shaded aspect; extending upto an altitude of about 4200 ft.

Family : *CANNABINACEAE*
Tribe : *CANNABINEAE*
Genus : *CANNABIS*

107. C. sativa, Linn.

A large shrub of moist places commonly along the bank of streams in association with *Mentha sylyistris* and *Rubus fruticosus*; collected near Chapri village from the banks of streams at an altitude of about 3000 ft.

Family : *URTICACEAE*
Tribe : *URTICEAE*
Genus : *DEBREGEASIA*

108. D. hypoleuca, Wedd.

A plant of exposed dry places of lower altitudes, commonly on coarse to fine

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gravely soil with low moisture content, as a whole very rare in the area; found at Dag and Chapri and an altitude of 2300-3000 ft.

Genus : *FORSKOHLEA*

109. F. tenacissima, Linn.

A small shrub of sun exposed dry places of lo altitudes commonly on coarse gravely soil with low moisture content; found mostly on the cliffs, collected from Dag and Chapri an altitude of 2300 -3000 ft.

B. MONOCOTYLEDONAE

Family : *AROIDEAE*
Tribe : *ARINEAE*
Genus : *SAUROMATUM*

110. S. guttatum, Schult.

Frequents shady and wet places commonly in or near water, collected from Dag in the stream to the south of the village.

Order : *CLUMIFLORAE*
Family : *CYPERACEAE*
Tribe : *EUCUPERAE*
Genus : *CYPERUS*

111. C. globosus, Allioni.

Exposed, growing in the muddy soil with high percentage of water or the bank of streams, also in shade, very occasional ascending upto 4200 ft.

112. C. niveus, Retz.

A plant of exposed, wet places, rarely found in shade, common at Dag, Chapri and ascending upto Cherat (4200 ft. in association with other Cyperaceae.)

113. C. aristatus, Rottb.

A small herb of wet and shady places commonly found in the streams or in mud in association with other plants of like habit, frequent in the streams near Dag and Chapri at an altitude of 2300 -3000 ft. occasionally found in flowing water at the southern aspects.

114. C. eleusinoides, Kunth.

A exposed plant of wet places commonly growing in or at the bank of streams, found near Dag in the streams, rarely found in the stream on the southern aspect.

Tribe : 2. *SCIRPEAE*
Genus : 1. *BULBOSTYLIS*

115. B. barbata, Kunth.

A small plant of shady and moist places commonly in or near water; found at Dag in the stream on the south of the village under the bridge, at an altitude of 2300 ft., very occasionally found in the water at the foot of the southern slopes and at some places in the streams in Khawara Valley.

Genus : 2. *FIMBRISTYLIS*

116. F. dichotoma, Vahl.

A plant of exposed and dry places commonly occuring on rocks found almost all over the hills in the open places in association with F *annua*, Roem, forming dense tufts.

117. F. annua, Roem.

A plant of exposed dry rocks or cliffs forming dense tufts usually in association with dichotoma species found abundantly on northern aspect in the open places, as a whole fairly common, ascending upto an altitude of 4200 ft.

118. F. junciformis,Kunth.

Common on rocky and exposed dry places usually found in tufts in association with *F. annua*, Roem., especially on northern aspect, throughout the hills, ascending upto an altitude of 4200 ft.

Family : *GRAMINEAE*
Tribe : 1. *PANICEAE*
enus : 1. *DIGITARIA*

119. strica, Roth.

On exposed places rarely found in shade, usually on coars to fine gravely soil with moderate moisture content very rare in the area found near Dag, Chapri, Cherat and Khawara Valley occasionally found in the hills ascending upto an altitude of 4200 ft.

Genus : 2. *PENNISETUM*

120. P. flaccidum, Griseb.

A tufted xerophytic plant of exposed, dry soil of the southern aspect ususally in association with *P. orientale*, Rich very occasionally found in Khawara Valley.

121. P. orientale, Rich.

Mostly on exposed dry soil with low moisture content, very rarely found in shade usually; in association with *P. flaccidum*, Griseb, found at Chapri and northern side of the hills; frequent in the Khawara Valley, ascending upto an altitude of 4200 ft.

Tribe : 2. *ANDROPOGONEAE*
Genus : 1. *SACCHARUM*

122. S. griffithii, Munro.

A hard stiff grass of rocky soil with low moisture content, occuring in large tufts, found almost all over the area, abundant near Dag at lower altitudes, occasional on the hills but again becomes abundant on the southern foot hills in the Khawara Valley.

Genus : 2. *HETEROPOGON*

123. H. contortus, Linn.

Mostly on exposed dry poor soil with low moisture content in association with other grasses; abundant near Dag and Chapri, rare on Shaded aspects, fairly common on southern aspect ascending upto an altitude of 4200 ft.

Genus : 3. *CYMBOPOGON*

124. C. schoenanthus, Schult.

A very large, abundant grass of the area mostly growing in tufts almost all over the area. It is a hard grass with tough stems. Shows a luxuriant growth in the places protected from winds.

CHRYSOPOGON

125. C. gryllus, Trin.

A large grass of both exposed and shady places commonly on coarse to fine gravely to rocky soil with moderate to low moisture content, as a whole rare; found at Dag, Chapri and the northern aspects ascending upto an altitude of about 4200 ft.

DICHANTHIUM

126. D. annulatum, Foresk.

On exposed and shady places commonly on gravely to silty clayey soil with moderate moisture content, very rare, found almost throughout the hilly tract.

Tribe : 3. *AGROSTIDEAE*
Genus : *ARISTIDA*

127. A. cyanantha, Steud.

A grass of exposed places on gravely or rocky soil found mostly at lower altitudes, very occasional in the hills ascending upto an altitude of 4200 ft.

128. A. adscenscionis, Linn.

A grass of exposed dry places commonly on gravely or rocky soil with low moisture content. At some places near Dag it was found in association with *A. cyanantha*, Steud, collected from northern aspects at an altitude, of about 4000 ft., as a whole rare.

Tribe : 4. *FESTUCACEAE*
ERAGROSTIS

129. E. papposa, Steud.

Mostly on exposed places, occasionally found in shade, on rocky soil with moderate to low moisture content, as a whole very rare, found on the southern aspects, occasionally found on other aspects.

Genus : 2. *DESMOSTACHYA*

130. D. bipinnata, Linn.

On exposed dry places growing all over the area where xeric conditions prevail, commonly on rocky soil with low moisture content, found at Dag in the dry stream bed where it was growing in large tufts; ascending upto an altitude of 4200 ft.

Genus : 3. *MELICA*

131. M. persica, Kunth.

Mostly on exposed places rarely found in shady places, commonly on coarse gravely soil with low to moderate moisture content. as a whole very occasional, found near Dag (2300ft.)

Genus : 4. *POA*

132. P. annua, Linn.

A common grass of exposed dry places mostly found on gravely soil very rarely on rocky soil with low moisture content, as a whole frequent found abundantly at lower altitudes near Dag and Chapri.

Tribe : 5. *HORDEAE*
Genus : *HORDEUM*

133. H. sp.

A very abundant small grass of both exposed and shady places preferably where sufficient moisture is available. It is a short lived grass which appears after rain but soon dries up when the moisture is exhausted; collected from southern aspect where it was growing in association with *Pennisetum flaccidum*, Griseb.

PHYTOSOCIOLOGICAL STUDIES

The Phytosociological studies were carried out by the *random Quadrat method.* The quadrats used were 50 by 50 ft. The studies were carried out in February, 1964; Average of 4 quadrats for each study :—

I DAG

(a) *Hilly Tract*

		Frequency.
Dominant.	*Cymbopogon schoenanthus, Schult.*	28%
Subdominant.	*Rhazya stricta, Dcne.*	25%
Abundant.	1. *Adhatoda vasica, Nees.*	15%
	2. *Aristida cyanantha, Steud*	10%
	3. *Peganum hermala, Linn.*	12%
	4. *Hordeum sp.*	5%
Occasional.	*Tribulus terestris, Linn.*	2.5%
Rare.	1. *Zizyphus mauritiana, Ham.*	1.5%
	2. *Anaphalis nubigena, DC.*	1%

Cymbopoghon schoenanthus, Schult is the dominant grass occupying large areas in the hilly tracts having a frequency of 28%. *Rhazya stricta, Dcne.* is a small shrub attaining a height of about 26" and is the subdominant plant of this area. It was observed growing both in pure formation and in association with *Cymbopogon scheonanthus, Schult* and other grasses. *Adhatoda vasica,* Nees, starts growth from this zone upwards. It is the most abundant shrub growing in associtation with grasses like *Aristida cyanantha, Steud and Hordeum sp.* These grasses grow in a loose association with one another. *Hordeum sp.* attains a height of only about 10" in the exposed places, usually in extensive formations.

Peganum hermala, Linn. is mostly scattered but is also observed in association with *Zizyphus muaritiana, Lam* and *Anaphalis nubigena, DC.* which are rather occasional. It is very common on the Western side of the village Dag, becoming frequent in the dry stream beds and being absent in the hills at high altitudes. *Marrubium vulgare, Linn.* is rare and sparse forming spreading bushes in the cliffs.

Acacia modesta, wall is the only moderate sized common tree growing in patches or in some localities being very abundant, attaining more height. *Cocculus pendulus, Diel* and *Cissampelos pareira. Linn* are occasional herbs found in this zone.

(b) *Dry Stream Bed.*

		Frequency
Dominant	*Hordeum sp.*	30%
Abundant		
	1. *Aristida cyanantha, Steud.*	20%
	2. *Aerua javanica, Juss*	16%
	3. *Chrysopogon gryllus, Trin*	10%
	4. *Peganum hermala, Linn*	8%
	5. *Cymbopogon schoenanthus, Schult.*	8%
Occasional		
	1. *Lactuca viminea, C. B. C.*	4.5%
	2. *Taraxacum officinalis, Wigg.*	3%
Rare		
	Rhazya stricta, Dcne	0.5%

The vegetation of the dry stream beds consists mostly of herbs with *Hordeum sp.* dominating. It grows in association with *Aristida cyanantha, Steud, Chrysopogon gryllus, Trin* and *Cymbopogon schoenanthusm, Schult.*

Aristida Cyanantha, Steud, shows more vigorous growth in the dry stream beds than on the hilly tracts.

Peganum hermala, Linn. Shows vigorous growth at some places & dominates, frequently it grows in association with the grasses mentioned above.

Adhatoda vasica, Nees. gows abundantly on the low hilly tracts and is occasionally found in the dry stream beds. *Aerua Javanica, Juss.* shows poor growth and was observed, in association with grasses.

Solanum nigrum, Linn and *S. xanthocarpum, Schrad* appear occasionally in the beds of streams.

Vitex negundo, Linn. is a wild small tree occuring on the boundry of fields.

Rhazya stricta Dcne is rare in the area.

II. CHAPRI (NORTH-WEST ASPECT)

(*a*) **Hilly tract**

		Ferquency
Dominant	*Rumex hastatus, D. Don.*	45%
Abundant.	*Cymbopogon schoenanthus, Schult.*	20%
Frequent		
	1. *Hordeum sp.*	10%
	2. *Aristida cyanantha, Steud*	10%
	3. *Oxalis conrniculata, Linn*	5%
	4. *Kickxia ramosessima, Wall*	5%

Occasional

1.	*Olea cuspidata, Royle.*	2%
2.	*Sageratia theezans, Brongn*	1%
3.	*Gymnosporia royleana, Wall*	1%

Rumex hastatus, D. Don. is the dominant herb of this wind and sun exposed aspect. It is a bushy small shrub with hard branches and small coreaceous leaves. It makes its apprearance on this side near Chapri Post growing on the cliffs and is abundant every where ascending upto the peak. It grows in big patches and the regeneration takes place from the old clumps.

Cymbopogon schoenanthus, Schult. is a hard stiff grass found on all the exposed aspects and shows luxuriant growth on this side. It grows in large tufts and attains a height of upto 36" in the exposed places. The regeneration taking place from the old clumps. Its growth is poor in the hollows of the ravines where tree vegetation dominates and the soil is wet and shady. *Oxalis corniculata, Linn.* is a shade loving small herb of wet and shady soil, growing in the shade of trees.

Hordeum sp. is a small grass with stiff awns and attains a height of about 12". At Cherat it is shorter. Inside the Quadret it was often observed in association with *Oxalis corniculata, Linn.* It was also found growing in association with *Aristida depressa* and *Saccharum griffithi, Munro.*

The growth of *Saccharum griffithii, Munro.* is very luxuriant at some places in the dry stream beds. *Kichxia ramossima, Wall.* is a weak herb, collected near Chapri post from coarse-fine gravely soil, and cliffs.

The trees are confined to *Olea cuspidata, Royle, Sageratia theezans, Brongn* and *Acacia modesrta, Wall. Olea cuspidata, Royle.* is a small tree with hard stem and thick leaves. The trees grows in association and they remain stunted in growth due to the effect of speedy winds, and often assume bushy forms.

(*b*) **Table Land** (North-West of Village Dage).

		Frequency
Dominant		
	Berberis ceratophylla, D. Don	40%
Aboundant		
1.	*Otostegia limbata, Bth*	20%
2.	*Cymbopogon schoenanthus, Schult*	15%
3.	*Hordeum sp.*	10%
4.	*Aristida depressa, Rietz*	8%

Occasional

1.	*Saccharum griffithii, Munro*	2%
2.	*Aerua persica, Burm (Merrill)*	2%
3.	*Chrysopogon gryllus, Trin*	2%

Rare.

1.	*Acacia modesta, Wall*	0.5%
2.	*Acacia arabica, Willd*	0.5%

The table land has coarse gravely soil dotted with small stones and some sand. It is fully exposed to sun and the moisture content is low generally.

Berberis ceratophylla, D. Don. is the dominat plant. It is a small, spiny shrub attaining a height of about 16" and growing in association with *Otostegia limbata, Bth.* It is occasionally found in association with *Aristifda depressa, Retz* and *Hordeum sp.*

Cymbopogon schoenanthus, Schult. It is a hard stiff grass and grows in large patches in the windy and sun exposed places. *Saccharum griffithii, Munro.* is another stiff hard grass with white wooly inflorenscence, rare on the table land, in large patches but shows a luxuriant growth in the dry stream beds or on the cliffs where it attains a height of about 36". Its regeneration takes place from the old clumps. It occurs mostly in association with *Desmostachya bipinnata, Linn. Aerua persica, Burm (Merrill),* Sometimes in association with *Chrysopogon gryllus, Trin.*

The tree vegetation is very poor and sparse. *Acacia modesta, wall* is the biggest tree growing in association with *Mimosa himalyana, Gamble.* and *Acacia arabica, Willd.* At some places *Sageratia theezans, Brongn* is observed in association with *Acacia arabica Willd.*

(c) Vegetation along the streams.

		Frequency
Dominant.	*Mentha sylvestris, Linn.*	35%
Abundant.		
1.	*Euphorbia hirta, Linn*	17%
2.	*E. prostrata, Burm.*	17%
3.	*Eclipta alba, Linn.*	10%
4.	*Oxalis corniculata, Linn.*	10%
5.	*Vitex negundo, Linn.*	5%
6.	*Ajuga bracteosa, Wall.*	5%
7.	*Adhatoda vasica, Nees*	5%
Occasional		
1.	*Rubus fruiticosus, Linn.*	2%
2.	*Sauromatum guttatum, Schult*	1%

The streams have flowing water almost at all times of the year and many of the plants growing here are semihydrophytic and mesophytic. The vegetation is dense and thick *Mentha sylvitris, Linn.* is the dominat herb. *Euphorbia hirta, Linn., E. prostrata, Burm., Eclipta alba, Linn* and *Oxalis corniculata, Linn.* are also abundant.

Adhatoda vasica, Nees. shows poor growth near the streams compared with its growth in the dry stream beds.

Vitex negundo, Linn. is abundant along the margins of the streams.

(*d*) Vegetation in Dry Stream Beds.

Adhatoda vasica, Nees. is the dominant shrub.

Cymbopogon schoenanthus, Schult. is observed an occasional grass sometimes associated with *Adhatoda vasica, Nees.*

Grasses like *Chrysopogon gryllus, Trin., Aristida depressa, Retz* and *Hardeum sp.* are common.

Astragalus subumbellatus, Klot. is an occasional small herb.

III. *NORTHERN ASPECT*

		Frequency
Dominant		
	Phagnalon niveum, Edgew.	40%
Abundant		
	1. *Oxalis corniculata, Linn.*	20%
	2. *Trichodesma indicum, DC.*	10%
	3. *Kichxia ramossessima, Wall.*	10%
	4. *Arenaria holosteoides, Edgew.*	5%
Occasional		
	1. *Chenopodium album, Linn.*	5%
	2. *Hordeum sp.*	4%
	3. *Cymbopogon schoenanthus, Schult.*	2%
	4. *Rumex hastatus, D. Don.*	2%
Rare.		
	1. *Olea cuspidata, Wall*	1%
	2. *Zizyphus oxyphylla, Edgew.*	1%

The vegetation on the Northern slopes consists of the Cantonment Reserved Forest in which *Olea cuspidata, Wall,* is the dominant tree growing in the association with *Acacia modesta, Wall, Sageratia theezas, Brongn,* and *Zizyphus oxyphylla, edgew.*

In the vegetation of the slopes *Phagnalon niveum, Edgew* is the dominant *composite*, growing in association with *Oxalis corinculata, Linn.* which is the sub-dominant herb of shady places.

Trichodesma indiucum, DC appears on this side often showing a luxuriant growth in the shade. It is found in association with *Rumex hastatus, D. Don.*

Zizyphus onyphylla, Edgew is a very occasional spiny tree growing in association with *Olea cuspidata, Royle* and *Acacia modesta, Wall*

IV. *CHERAT*

Dominant.		Frequency
	Hordeum sp.	40%
Abundant		
	1. *Cymbopogon schoenanthus, Schult.*	30%
	2. *Aristida depressa, Retz.*	15%
	3. *Arenaria holosteoides, Edgew*	5%
Occasional		
	1. *Erigeron linifolius, Willd.*	5%
	2. *Lactuca viminea, Clarke.*	3%
Rare		
	1. *Artemisia scoparia, Waldst.*	1%
	2. *Olea cuspidata, Wall.*	1%

Hordeum sp. is the dominant small grass found mostly in the shady, wet places in association with *Cymbopogon schoenanthus, Schult.* and *Aristida depressa, Retz.* The latter is a short lived plant which utilized the superficial moisture of the soil and as the moisture content is exhausted, it dries up. Regeneration takes place from the old clumps.

Arenaria holosteoides, Edgew. is a small plant growing under the shade of trees where sufficient moisture is present.

Erigeron linifolius, Willd, Leactuca viminea, Clarke and *Artemisia scoparia, Waldst.* occur rarely or occasionally in the area.

Pinus roxburghii. is a tall tree, growing near road sides and is the only Gymnosperm found in the area. *Micromeria biflora, Benth.* is a small herb with aromatic leaves growing abundantly in both exposed and shady places. *Schoenis molle.* medium sized tree with aromatic leaves on the road side and seems to be cultivated.

V. *SOUTHERN ASPECT* (*a*) Slopes.

		Frequency
Dominant		
	Hordeum sp.	40%
Abundant		
	1. *Cymbopogon schenanthus, Schult.*	25%
	2. *Euphorbia prostrata, Burm.*	25%
	3. *Pennisetum orientale, Rich*	5%
	4. *Nepeta graciliflora, Benth.*	2%
Occasional		
	1. *Artimisia scoparia, Waldst*	1%
	2. *Dicliptera roxburgrana, Nees.*	1%
	3. *Astragalus pyrrhotrichus, Boiss*	1%

The Southern aspect is exposed to sun and wind. It is hot and dry with almost half the moisture content of that of the Northern aspects.

The vegetation of this side is mostly confined to small herbs and shrubs with very poor growth of trees except where actual forest is present.

Cymbopogon schoenanthus, Schult. is a hard stiff grass growing in patches and can withstand high winds, *Hordeum sp.* gains dominance at certain waste places in association with *Dicliptera roxburghiana, Nees* and *Nepeta graciliflora, Benth.* are small herbs, growing only at a few places where they are associated with the dominant grasses.

Artimisia scoparia, Waldst is a bushy herb of the dry exposed places, scattered at high altitudes. A bit down the Southern slopes it shows a luxuriant growth in association with *Dodonaea viscosa, Linn.* Another species of Artimisia (Atimisia sp) is found the association with *Artimisia scoparia, Waldst.* which has small yellow scented flowers and much divided scented leaves. The growth of this species too, decreases on higher altitudes. *Euphorbia prostrata, Burm* It is a prostrate small herb adpressed to the surface of the soil.

Astragalus pyrrhotrichus, Boiss. is small herb with, beautiful yellow flowers and small globose hairy leaves growing mostly in the crevices of the rocks.

(*b*) **Foot of slopes (Khawara Valley)**

		Frequency
Dominant.		
	Dodonaea viscosa, Linn.	40%
Abundant		
	1. *Adhatoda vasica, s.*	22%

	2. *Cymbopogon schoenanthus, Schult.*	15%
	3. *Rhazya strictsa, Dcne.*	10%
	4. *Artistida depressa, Retz.*	10%
Occasional		
	1. *Euphobia hispida, Boiss.*	1%
	2. *Hordeum sp.*	1%
	3. *Saccharum griffithii, Munro.*	1%

Dodonaea viscosa, Linn. goes on increasing in density down the Southern slopes and gains dominance at the foot of hills where the Khawara Valley starts. The soil has stones of various size and a little sand mixed with clay. It grows in with association with *Adhatoda vasica, Nees* and *Rhazya stricta, Done.* which are the most abundant shrubs on this side where the altitude is lower. At some places *Dodonaea viscosa Linn.* grows into large bushes and reaches the height of a small tree.

The grasses too are in abundance of which *Cymbopogon schoenanthus Schult* grows in large patches, sometimes in a loose association with *Euphorbia hispida, Boiss.* Which is a small prostrate herb with hairy leaves and fruits.
Aristida depresssa, Retz and *Hordeum sp.* grow in association with *Cymbopogon schoenanthus, schult.*

The arboreal vegetation is confined to *Acacia modesta, Wall,* which is the only tree in the Khawara Valley. At some places in the plains it is occasionally observed in association with the other trees. It attains a greater height in the open places where the arboreal vegetation is poor but remains bushy in the thick forests.

VI. *EASTERN ASPECT*

		Frequency
Dominant		
	Stellaria media, Linn.	50%
Abundant		
	1. *Phagnalen oiveum, Edgew.*	15%
	2. *Portulaca quadrifida, Linn.*	10%
	3. *Lephyrodichis holosteoides.*	8%
	4. *Oxalis corniculata, Linn.*	8%
Rare		
	1. *Hordeum sp.*	5%
	2. *Chrysopogon gryllus, Trin.*	3%
	3. *Inula graveolens, Desfort.*	1%

The arboreal vegetation along this aspect is very thick and prvides shade and moisture for the growth of herbs. The moisture content of the soil is high. The herbaceous vegetation is represented by *Setellaria media, L Phagnalon niveum, Edgew, Portulaca quadrifida, Linn, Inula graveolena Desfort,* and *Oxalis corniculata, Linn.* The former is a small weak herb of shady wet places in association of *Phagnalon niveum, Edgew* and *Oxalis corniculata, Linn.* It was nowhere observed in the exposed places. It is a short lived plant and dries up in early spring.

Portulaca quadrifida, Linn. and *P. oleracea, Linn.* are small succulant herbs growing in the shade under the cliffs in association with *Phagnalon niveum, Edgew: Asplenium* and *Adiantum,* mosses and other cryptogams.

Arenaria holosteoides, Edgew. is a very small plant growing on shady wet soil in association with *Phagnalon & Oxalis.*

In some exposed places *Cymbopogon schoenanthus, Schult.* and *Artistida depressa, Retz* were observed in association.

VII. *WESTERN ASPECT*

Dominant		Frequency
	Stellaria media, Linn.	30%
Abundant		
	1. *Phagnalon niveum, Edgew*	20%
	2. *Oxalis corniculata Linn*	15%
	3. *Conyza crispus, Pourr.*	15%
Futqenre		
	1. *Sonchus arvensis, Linn*	6%
	2. *S. maritimus, Linn.*	5%
	3. *Taraxacum officinale, Wing*	5%
Occasional		
	1. *Poa annua, Linn.*	2%
	2. *Aristida depressa, Retz*	1%
	3. *Hordeum sp.*	1%

The vegetation on this aspect does not differ from that on the eastern aspect expect that some of the *Composites* like *Sonchus arvensis; Linn. Conyza crispus Pourr, S. maritimius, Linn., Taraxacum Officinale, Wigg.* and grasses like *Poa annua, Linn.* and *Aristida depressa, Retz.* make their appearance. The

Composites and *Phagnalon niveum, Edgew, Oxalis corniculata, Linn.* and *Hordeum sp.* grow in an association together in the Quardret studied.

Many cyperaceae like *Fimbristylis annua, Roem, F. dichotoma, Vahl.* and grasses like *Cymbopogon schoenanthus, Schult* and *Chrysopogon gryllus, Trim,* grow on the cliffs in the exposed places.

Tree vegetation is confined to *Acacia modesta, Wall, Olea cuspidata, Wall, Zizyphus oxyphylla, Edgew* and *Sageratia Theezans, Brongn.* All these are bushy trees and grow in association in the Cantonment Reserve Forest.

ARBOREAL VEGETATION

The arboreal vegetation of the area is confined mostly to a few species of which *Olea cuspidata, Wall* is the dominant.

Other common trees are the following :—

Acacia modesta, Wall, *Acacia arabica,* Willd, *Zizyphus oxyphylla,* Edgew, *Z. mauritiana,* Ham. *Sageratia theezans,* Brongm, *Gymnisporia royleana,* Wall.

Acacia modesta, Wall. shows luxuriant growth at lower altitudes near Chapri and Dag. Going up the hills its growth decreases but on the Southern warmer dry aspect it is the dominant tree at some places where it leaves the association of *Olea cuspidata,* Wall. Near Chapri it was found growing alone where it attained a great height. At some places it was found in a loose association with *Acacia arabica, Willd.* and *Mimosa himalyans, Gamble.* Which is the occasional tree of lower altitudes. *Acacia modesta,* Wall was found in close association with the forest trees in the hills where it assumes a bushy form.

Olea Cuspidata, Wall. is a tree of high altitudes & is absent from the lower altitudes. In the hills especially on the shaded aspects it becomes dominant.

Gymnosporia royleana, Wall is a small tree with thick hard and sharp spines abundant, near Chapri and occasionally found in the hills.

Sageratia threezans, Brongmn, is a spiny tree with small leaves and grows near Chapri in association with other trees. It has a hard stem and assumes a bushy form probably due to wind effect.

Zizyphus mauritiana, Ham, is a thorny tree common at lower altitudes where its growth is sparse.

Z. oxphylls. Edgew, is a tree of higher altitudes and appears near the top in association with the other forest trees.

Dodonaea viscosa, Linn. attains the height of a small tree on the southern aspect while at other places it remains bushy and small.

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