MATERIALS AND METHODS

1. **FIELD WORK:**

An intensive field work was carried out every week in all seasons with more frequency during rainy season, so that nothing escapes of the herbaceous ephemeral flora appearing in that season.

During collection trips plants were collected in different developmental stages and exhaustive field notes were taken. Special care was taken to record habit, habitat, abundance, colour and fragrance of the flower etc. in general to the observations which cannot be studied by examining the herbarium specimens.

Cooke's flora was the basis for a cursory identification at the end of a day's work. Plants collected were properly pressed, numbered and dried. By frequent visits to the areas, accurate frequency, relative abundance, distribution, phenology and life cycle of each plant was studied. During outings several black and white and some coloured photographs were taken.

(ii) **LABORATORY WORK:** In the laboratory all the plants were processed in a customary way (See Santapau in *Botanical Collector's*
Flowers of most of the plants, which were preserved in 4% formalin, during excursion were then critically examined after careful dissections and in a number of cases camera lucida drawing were prepared. This was helpful to me at the time of checking the identification with the descriptions in Cooke's *Fl. Pres. Bombay*. Final identification was confirmed by carefully checking with the aid of monographs and other available literature on plant taxonomy. Identified herbarium specimens were compared with the authentic ones in Herbarium, Botanical Survey of India, Western circle, Poona and Central National Herbarium, Sibpore, Howrah. After identifications were confirmed the herbarium sheets were labelled and deposited in the Herbarium of the Department of Botany, Sardar Patel University, Vallabhbh Vidyanagar.

**THESIS PLAN**

In the thesis arrangement of families is according to Cooke's (reprinted 1958) *Flora of the presidency of Bombay*, however in some cases the circumscription of the families has been restricted following Hutchinson (1959). For the sake of convenience, the genera in a family and species within a genus
are arranged alphabetically. Artificial keys based on exomorphic characters have been given for genera and species.

The nomenclature has been brought up-to-date in light of the current researches and in accordance with the rules of the International Code of Botanical Nomenclature 1967. Most of the names are those given in Cooke's Flora, but when the name is changed the correct name in my opinion is given first. It is followed by such synonym as may explain the reasons for nomenclatural changes. Nomenclature of cultivated plants adopted from Bailey (1960) Manual of Cultivated Plants.

Based on personal critical observations from fresh as well as herbarium materials, a short description is given for each plant. Which is followed by a note on its relative abundance, habit, habitat, etc., flowering and fruiting time, collection numbers, local names, economic or local uses if any and world distribution, and critical note to explain either nomenclature or remarks on the identity of plants are given wherever necessary. In support of my observations are given: illustrations and photographs of plants.

LIST OF ABBREVIATIONS USED IN THE TEXT

Aq. Angio........ Subraramanyam, K. Aquatic Angiosperms
CSIR, 1962.
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<thead>
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<th>Author(s)</th>
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<td>Bor &amp; Raizada</td>
<td>Some beautiful Indian climbers and shrubs, 1954.</td>
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<td>Bulletin of Botanical Survey of India.</td>
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<td>Chavan &amp; Oza</td>
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<td>Flora of British India.</td>
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<td>The flora of the presidency of Madras, 1958 (Reprinted).</td>
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<td>A catalogue of plants growing in Bombay.</td>
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<td>Haines</td>
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<tr>
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GENERAL PATTERN OF VEGETATION

The vegetation of Bulsar area can be divided into two main categories: viz. (i) Forest and (ii) Plain land vegetation.

The forests and plain land vegetation of Bulsar area conforms to "Monsoon Deciduous Forest" or "Southern Tropical Moist Deciduous Forest" type of Champion. As different species shed off their leaves at different times of the season, not a single area is completely deciduous in any one season. However in hot season (i.e. March-May) as the trees are without leaves, the Dungri forests become rather more open and eye-soaring. Comparatively the vegetation along river banks, ponds, sea-shore etc. is more dense and green. The plain land vegetation presents
a very open appearance so that the tree and shrubs are spaced
distantly.

For the sake of convenience the vegetation is described
in eight different heads:

(i) Forest vegetation of Dungri Hills.
(ii) Vegetation of cultivated fields.
(iii) Vegetation along road-sides, railway lines and
     near villages.
(iv) River bank and River-bed vegetation.
(v) Vegetation of ponds and ditches.
(vi) Marshy vegetation near sea shore.
(vii) Grass land vegetation.
(viii) Cultivated and crop plants.

(i) Forest vegetation of Dungri Hills:

Trees:
Common:

\textit{Acacia chundra} \textit{x} (Roxb.) Willd.
\textit{Acacia nilotica} (Linn.) Del. Subsp. \textit{indica} (Benth.) Brehm
\textit{Bauhinia racemosa} Lank.
\textit{Bridelia squamosa} (Muell.-Arg.) Gehrm.
\textit{Cassie fistula} Linn.
Grevia tiliasefolia Vahl
Ixora arbores Roxb. ex Sm.
Mallotus philippensis Muell.-Arg.
Pongamia pinnata (Linn.) Pierre
Terminalia indica Linn.
Terminalia arjuna Royle
Occasional:
Acacia farnesiana Willd.
Acacia maracola (L.) Corr.
Albizia lebbeck (L.) Bth.
Bombax ceiba Linn.
Butea monosperma (Lamk.) Taub.
Cordia dichotoma Forst.f.
Diospyros melanoxylon Roxb.
Dolichandrone falcata Seem.
Garuga pinnata Roxb.
Gmelina arborea Roxb.
Madhuca indica Gmel.
Mill/leaf tomentosa (Roxb.) Sinclair
Morinda tomentosa Hayne ex Roth
Saninga emarginata Vahl
Sterculia urens Roxb.
Tectona grandis Linn.f.
(xix)

Rare:

- **Acacia leucophloea** Willd.
- **Ailanthus excelsa** Roxb.
- **Albizia odoratissima** Bth.
- **Carapa arborea** Roxb.
- **Elaeodendron roxburghii** W. & A.
- **Okeania ooiininsia** (Roxb.) Hochreut.
- **Terminalia bellirica** (Gaertn.) Roxb.

Shrubs:

Common:

- **Abutilon indicum** (L.) Sweet
- **Calotropis gigantea** R.Br.
- **Carissa congesta** Wt.
- **Flacourtia indica** (Burm.f.) Merrill.
- **Holarrhena antidiarrhoeica** Wall. ex. DC.
- **Lespedeza macrophylla** (Roxb.) ex Hornem.
- **Maytenus emarginata** (Willd.) Ding Hou
- **Urena lobata** Linn.
- **Woodfordia fruticosa** (L.) Kurz

Occasional:

- **Bridelia hamiltoniana** Wall.
- **Cedaba fruticosa** (L.) Druce.
Capparis sepiaria Linn.

Xeromphila spinosa (Thunb.) Keay

Rare:

Barleria prattensia Sant.

Maytenus puberula (Laws.) Loes

Climbers:

Abrus precatorius Linn.

Ampelocissus latifolia (Roxb.) Planch.

Canavalia gladiata (Jacq.) DC.

Capparis zeylanica Linn.

Cardiospermum halicacabum Linn.

Cavratia cernosa Gagnep.

Celastrus paniculatus Willd.

Coccinia grandis (Linn.) Voigt.

Cocculus hirsutus (L.) Diels

Combretum ovalifolium Roxb.

Dioscorea bulbifera Linn.

Mucuna prurita Hk.

Rhynchosia minima DC.

Tereanthes labialis (L.f.) Spreng.

Tinospora cordifolia (Willd.) Miers.
Occasional:

Atyloaia platycarpa Bth.
Cassalpinia criata Linn. p.p.
Cissampelos pareira Linn.
Drosera volubilis (L.f.) Bth. ex Hook.f.
Hemidesmus indicus Schultes.
Ventilago denticulata Willd.
Zizyphus rugosa Lamk.

Rare:

Cissus repanda Vahl
Cryptolepis buchanani Roem. & Schult.
Inomoea pesticridis Linn.
Melothria perpusilla auct. (non cogn.)
Pueraria tuberosa (Roxb.) DC.

Herbs:

Common:

Biophytum sensitivum DC.
Boerhavia diffusa Linn.
Borreria articularia (L.f.) F.N.Will.
Borreria stricta (L.f.) Schum.
Crotalaria filipes Bth.
Curculigo orchioides Gaertn.
Echinops echinatus Roxb.
(xxii)

**Goniogyne hirta** (Willd.) Ali

**Haularthaus tentaculatus** Nees Var. **plumosa** (Anders.) Clarke

**Polyzala chinensis** Linn.

**Polyzala ecrioptera** DC.

**Smithia conferta** Sm.

**Zornia gibbosa** Span.

**Occasional:**

**Curcuma inodora** Blatt.

**Fleurva interrupta** (L.) Gaud.

**Indigofera aetragalina** DC.

**Indigofera glandulosa** Roxb. ex Willd.

**Scilla hyacinthina** (Roth) Macbr.

**Tacca leontopetaloides** (L.) O.K.

**Tanphrosia numila** Pers.

**Rare:**

**Alternanthera pungens** H.B.K.

**Buchnera hispida** Buch.-Ham.

**Chlorophyrum tuberosum** (Roxb.) Baker

**Crotalaria nana** Burm.

**Pouzolsia zevlanica** (L.) Bth.

**Punalia lappacea** Juss.

**Ursinea indica** (Roxb.) Kth.
ii) Vegetation of cultivated fields:

Eleusine coracana Gaertn., Oryza sativa Linn., Paspalum acrobiculatum Linn., Triticum aestivum Linn. and other legumes are commonly cultivated in the area. After the harvest of the crop by about the first week of November a number of fields are left undisturbed. Many plants typical of the cold season appear as weeds in these fields. They are common and abundant, scattered or some times occur in pure stands:

*Amaranthus spinosus* Linn.
*Amaranthus tenuifolius* Willd.
*Argemone mexicana* Linn.
*Blumea eriantha* DC.
*Blumea lacera* (Burm.f.) DC.
*Blumea membranacea* (Wall.) DC.
*Blumea obliqua* (L.) Druce.
*Dopatrium junceum* (Roxb.) Buch.-Ham.
*Clinus lotoides* Linn.
*Glossostigma diandrum* (L.) O. Kuntze.
*Leucas aspera* (Willd.) Spreng.
*Ludwigia perennis* Linn.
*Sphaeranthus indicus* Linn.
*Stemodia serrata* Bth.
Stemodia viscosa Roxb.
The other common plants are:

Ammannia baccifera Linn.
Ammannia multiflora Roxb.
Amaranthus viridis Linn.
Aristolochia bracteolata Lamk.
Bergia ammannioides Heyne.
Casulia axillaria Roxb.
Cardiospermum halicacabum L.
Chrozophora prostrata Dalz.
Chrozophora rotliari Juss.
Corchorus aestuana Linn.
Corchorus fascicularia Lamk.
Elvrophorus spicatus (Willd.) Camus
Eriocaulon dianae Fyson
Euphorbia rothiana Spr.
Heliotropium supinum L.
Melilotus alba Lamk.
Melilotus indica All.
Oldenlandia corvabosa Linn.
Phyllanthus asperifolius Hutchinson
Phyllanthus madrasapatensis Linn.
Phyllanthus simplex Retz.
Vahlia digyna O.K.

Cyperaceae number of species.

Many of these plants disappear by the beginning of Summer. However a few resistant species survive even when the soil is completely dry, during hot season and disappear only after the first rains of the monsoon season of the next year. They are Argemone mexicana Linn., Blumea eriantha D.C., Blumea lasera DC., Blumea obliqua (L.) Druce, Chrozophora prostrata Dalz., Heliotropium supinum Linn., Sphaeranthus indicus Linn., Stedodia viscosa Roxb., Stedodia serrata Bth.

(iii) Vegetation along road-sides, railway lines and near villages:

A number of trees are planted along road sides as shade or avenue trees. They are Azadirachta indica Juss., Albizia lebbeck (L.) Bth., Cassia various species; Dalbergia sissoo Roxb., Delonix regia Rea, Millingtonia hortensis Linn. f., Felophorum pterocarpum Baker, Polyalthia longifolia Thw. and Samanea saman Merr. Adina cordifolia (Roxb.) Hook.f., Annona reticulata Linn., Annona squamosa Linn., Artocarpus heterophyllus Lamk., Cordia gharaf (Forsk.) Ehr., & Asch. Crataeva nurvala Buch., Madhuca indica Gmel., Mangifera
indices Linn., Manilkara hexandra Dub., and Tamarindus indica Linn. are also common along road sides, hedges around cultivated fields and near villages. Along railway lines Andrographis echioides (Linn.) Nees, Alternanthera pungens H.B.K., Aristolochia bracteolata Lamk., Barleria prionitis Linn., Cassia occidentalis Linn., Cassia tora Linn., Grewia flavescens Juss., Hybanthus enneaspermus (L.) F. Muell., Mimosa hamata Willd., Plumbago zeylanica Linn. and Tribulus terrestris Linn. are some of the common plants.

On the hedges along road-sides and railway lines a number of twiners belonging to the families Asclepidaceae, Celastraceae, Combretaceae, Convolvulaceae, Cucurbitaceae, Dioscoreaceae, Menispermaceae, Papilionaceae, Sapindaceae, Vitaceae etc. are common. Among the conspicuous ones by the masses of brightly coloured flowers are Canavalia gladiata DC., Clitoria ternatea Linn., Gloriosa superba Linn., Ipomoea spp., Luffa spp., Momordica dioica Roxb. Muquna prurita Hk., Oxytropis secamone Karst. and Trichosanthes cucumerina Linn.

(iv) Vegetation of river beds and river banks:

The river beds and river banks are mostly alluvial and sandy but at Ghadoi, Marla, Thakkarwada etc. are gravelly and rocky in some parts and alluvial in others. Some of the
common plants of the river banks and river beds are listed below:

A. River banks:

Trees:

- **Acacia leucophloea** Willd.
- **Acacia nilotica** (L.) Del. subsp. *indica* (Bth.) Brenan.
- **Acacia senegal** Willd.
- **Alangium salvifolium** (L.f.) Wang.
- **Dalbergia latifolia** Roxb.
- **Ehretia laevis** Roxb.
- **Mallotus philippensis** (Lamk.) Müll.-Arg.
- **Pandanus fascicularis** Lamk.
- **Trema orientalis** (L.) Blume

Shrubs and under shrubs:

- **Aerva sanguinolenta** (L.) Blume
- **Antidesma ghaesembilla** Gaertn.
- **Desmodium triangulare** var. *congestum* (Prain) Sant.
- **Leniadathis cuspidata** Nees
- **Moghania astrobilifera** (Linn.) St. Hil. ex Jacks.
- **Plumbago azuliana** Linn.
- **Pollnostemon parviflorus** Bth.
(xxviii)

Sida cordifolia Linn.
Urena lobata Linn.
Woodfordia fruticosa (L.) Kurz

Climbers:

Atylosia platycarpa Bth.
Coccinia grandis (Linn.) Voigt.
Combratium ovalifolium Roxb.
Dalberzia volubilis Roxb.
Derris scandens Bth.
Jacquemontia paniculata Hall.f.
Pentatropis canescens (L.f.) Bullock
Petalidium barlerioides (Roth) Nees
Rhynchosia minima DC.
Ventilago denticulata Willd.

Herbs:

Argemone mexicana Linn.
Elephantopus repens (W Wahl) Roth
Euchnera hispida Buch.-Ham.
Crotalaria filipes Bth.
Euphorbia hirta Linn.
Indigofera cordifolia Heyne ex Roth
Leucas biflora R.Br.

Lindernia auraria Roxb.

Martynia annua Linn.

Nelsonia canescens (Lamk.) Spreng.

Ophioglossum costatum (Schum.) R.Br.

Scilla hyacinthina (Roth) Macbr.

Solanum surattense Burm. f.

Striga angustifolia (Don) Saldhana

Torenia indica Saldhana.

B. River bed:

Ammannia baccifera Linn.

Athyrium esculenta (Retz.) Copel.

Canecora diffusa R.Br.

Cleome ochidoni Linn.f.

Crinum pratense Herbert.

Cryptocoryne retrospiralis Fisch. ex Wydler.

Cyatholepis purpurea (Don.) Kuntze.

Dentella repens (L.) Forst.

Exacum pedunculatum Linn.

Heliotropium indicum Linn.

Heliotropium ovalifolium Forsk.

Hemigraphis latebrosa Nees
The area explored is traversed by nine permanent, 84 species.
temporary ponds and several ditches. The temporary ponds and ditches get filled up during monsoon and dry up by the beginning of summer. The first plants to appear after the rains in these temporary and permanent ponds are *Nymphaea nouchali* Burm.f., *Nymphaea stellata* Willd., *Nymphoides indicum* (Linn.) O.K., followed by *Azolla pinnata* R. Br., *Lemma gibba* Linn., *Lemma trisulca* Linn. and *Wolffia microscopica* Kurz. Their growth is rapid and often cover large surface of water. The list of permanent and temporary ponds and pH measured of the water of permanent ponds only is given in the following table:

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<th>Sr. No.</th>
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<th>Number of permanent ponds</th>
<th>pH value</th>
<th>Number of temporary ponds</th>
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<td>Atak Pardi</td>
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<td>--</td>
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<td>--</td>
</tr>
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<td>Bhagal</td>
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<td>--</td>
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<td>Bhagdavada</td>
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<td>--</td>
<td>6</td>
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<td>8.</td>
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<td>Sr. No.</td>
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</table>
A number of plants found as members of aquatic flora are classified as under:

**Submerged:**

*Blyxa echinosperma* (Clarke) Hook. f.
Ceratophyllum demersum Linn.

Hydrilla verticillata Royle

Najas minor (Pers.) All.

Mechamandra alternifolia (Roxb.) Thw.

Ottelia alismoides (L.) Pers.

Potamogeton perfoliatus Linn.

Utricularia inflata Porsk. var. stellaria (Linn.f.) Taylor

Vallisneria spiralis Linn.

Chara sp.

Nitella sp.

Floating:

Aponogeton natans (L.) Engl. & Krause.

Azolla pinnata R.Br.

Eichhornia crassipes (Mart.) Solms.

Hydrocyon aristata (Retz.) Nees ex Wt. & Arn.

Lemna gibba Linn.

Lemna trisulca Linn.

Lemnophyton obtusifolium (L.) Miq.

Nelumbo nucifera Gaertn.

Nymphaea nouchali Burm.f.

Nymphaea stellata Willd.
A number of plants have been collected from moist places along margins of ponds and ditches. Some of them which occur in pure stands are listed here:

* Alternanthera sessilis* (Linn.) DC.
* Ammannia baccifera* Linn.
* Ammannia multiflora* Roxb.
* Bacopa monnieri* (Linn.) Penn.
* Casulina axillaris* Roxb.
* Ceratonteria thalictroides* (L.) Brogn.
* Coix lachryma-jobi* Linn.
* Dentella repens* (L.) Forst.
* Donatiaria juncoides* (Roxb.) Buch.-Ham.
* Echinochloa colonum* (Linn.) Link
* Eclipta prostrata* Linn.
* Eriocaulon dianae* Pyson
* Gnaphalium luteo-album* Linn.
By about the end of December most of the temporary ponds and ditches begin to dry up. The following are some of the plants in addition to the ones listed above which may form pure or mixed patches:

- **Argemone mexicana** Linn.
- **Chrozophora prostrata** Delz.
- **Chrozophora rotteri** (Geis.) Juss. ex Spr.
- **Eriocsetum hysopifolium** (Willd.) Verd.
- **Euphrobia parviflora** Linn.
- **Euphrobia parviflora** Linn.
Euphorbia thymifolia Linn.
Clinus lotoides Linn.
Grande a maderaspatana (Linn.) Poit.
Heliotropium ovalifolium Forsk.
Heliotropium aspinum Linn.
Hornsea dichotoma Willd.
Indigofera cordifolia Heyne ex Roth
Indigofera linifolia Retz.
Indigofera Linnacei Ali
Polycarpum prostratum (Forsk.) Aschers. & Schweinf.
Polygonum plebeium R.Br.
Sphaeranthus indicus Linn.

(vi) Marshy vegetation near sea-shore:

About 3 KM. west of Bulsar town is Arabian Sea. The sea-shore is sandy where number of sand binders found are: Casuarina equisetifolia Forst., Ipomoea pes-caprae (L.) Sweet, Prosopis juliflora DC. Of these Casuarina equisetifolia Forst. and Prosopis juliflora are cultivated. Where the river Vanki and Auranga meet the sea, marshy plants such as Avicennia alba Blume, Rhizophora mucronata Lank., Salicornia brachiata Roxb., Suaucium portulacastrum Linn; Suaeda nudiflora Moq. are found. Alueropus lagunodes Trin., Clerodendrum inerme (L.F.) Gaertn.
Pedaliun aurex Linn., Premna integrifolia Linn., and Salvadora persica Linn. etc. are also found near Sea-shore.

(vii) Grass-land vegetation:

After the first few showers a number of grasses sprout up and the whole ground appear as if it is covered with a green carpet. Among these are: Aculuda mutica Linn; Brachiaria ramosa (Linn.) Stapf, Cenchrus biflorus Roxb., Chaloria barbata Sw., Dactyloctenium aristatum Link, Desmostachya biminnata Linn., Echinochloa colomon Linn., Eragrostis various species, Erichloa procura Retz., Hackelocholea granularia (Linn.) O.K., Heteropogon contortus Linn., Imperata cylindrica Linn., Iasachne globosa × (Thumb.) O.K., Panigum antidotale Retz., Panicum maximum Trin., Setaria glauca Linn., Setaria verticillata Linn., Sorghum miliacum (Roxb.) Snowden, Sporobolous diander Ratz., Themedia quadrivalvis (L.) O.K. and Vetiveria ziganiodes (Linn.) Nash.

Among grasses a number of dicotyledonous plants appear during monsoon. They are listed below:

Alvsicarpus longifolius Wt. & Am.
Atylosia platycarpa Bth.
Biosphrump sensitivum (Linn.) Dalr.
Centranthera nepalensis D. Don
Desmodium spirale DC.
Epicoatema hypaeopifolium (Willd.) Verd.
Exacum bicolor Roxb.
Habenaria marginata Coleb.
Honea dichotoma Willd.
Nepentia triquelra Bth.
Polygala chinensis Linn.
Polygala eriontera DC.
Rhamphicarpea longiflora (Arn.) Bth.
Rhnchoaspora wightiana Steud.
Smithia conferta Sm.
Sonubia delphinifolia G. Don
Striga anquatifolia (Don.) Saldiana
Striga asiatica (Linn.) Kuntze
Tephrrosia strigosa (Dalz.) Sant. & Maheshw.
Utricularia caerulea Linn.

(viii) Cultivated and crop plants:

The following is the list of cultivated and crop plants in the area:

Cereals:

Amaranthus hybridus ssp. cruentus var. paniculatus Thell.
Eleusine coracana Gaertn.
(xl)

**Oryza sativa** Linn.

**Paspalum acrobiculatum** Linn.

**Pennisetum typhoides** Burm.f.

**Sorghum vulgare** Pers.

**Triticum aestivum** Linn.

**Zea mays** Linn.

**Pulses:**

** Cajanus cajan** Millsp.

** Dolichos lablab** Linn.

** Cicero arietinum** Linn.

** Phaseolus aconitifolius** Jacq.

** Phaseolus angularis** Wt.

** Phaseolus mungo** Linn.

** Phaseolus sativus** Linn.

** Vigna unguiculata** Walp.

**Vegetables:**

** Abelmoschus esculentus** Moechn.

** Allium cepa** Linn.

** Basella rubra** Linn.

** Beta vulgaris** Linn.

** Coccinia grandis** (Linn.) Cogn.
Colocasia esculenta Schott
Cucumia sativa Linn.
Cyamopsis tetragonoloba Taub.
Daucus carota Linn.
Ipomea batatas Linn.
Lagenaria leucantha Rusby
Luffa acutangula Roxb.
Luffa cylindrica M.J. Roem.
Lyconersicon lyconersicum A. Shaw.
Raphanus sativus Linn.
Raphanus sativus var. caudatus Linn.
Solanum melongena Linn.

Fruits:

Achras zapota Linn.
Anacardium occidentale Linn. (Planted on Dungri hills)
Carica papaya Linn.
Mangifera indica Linn. (Alphonse and several other varieties).
Musa paradisiaca Subsp. sapianum (Linn.) K. Schum.
Psidium guajava Linn.
Punica granatum Linn.
Syzgium cumini (Linn.) Skeels
Syzgium malaccense (L.) Merrill & Perry
Spices and condiments:

Allium sativum Linn.
Anethum graveolens Linn.
Brassica juncea Linn.
Capsicum annuum Linn.
Coriandrum sativum Linn.
Cuminum cyminum Linn.
Curcuma aromatica Salisb.
Curcuma domestica Val.
Poeniculum vulgare Mill.
Mentha piperita Linn.
Murraya koenigii Spreng.
Trigonella foenum-graecum Linn.

Oil yielding plants:

Arachis hypogea Linn.
Guzmania abyssinica Cass.
Ricinus communis Linn.
Sesamum indicum Linn.

Fibre plants:

Bombax ceiba Linn.
Crotalaria juncea Linn.
(xliii)

Gossypium arboreum Linn.
Gossypium herbaceum Linn.
Dalotropia gigantea R. Br.
Corchorus olitorius Linn.
Hibiscus cannabinus Linn.

Fodder plants:

Cyamopsis tetragonoloba (Linn.) Taub.
Medicago sativa Linn.

Other crop plants:

Nicotiana tabacum Linn. (rarely)
Saccharum officinarum Linn.

Changes induced in the vegetation due to seasonal fluctuations:

After a first few showers of rain in the early June, several plants of the families Amaryllidaceae, Araceae, Commelinaceae, Hypoxidaceae, Liliaceae, Orchidaceae and Zingiberaceae come in flower. Some of the common plants are Amorphophallus campanulatus Blume, Amorphophallus commutatus (Schott) Engler, Chlorophytum tuberosum (Roxb.) Baker, Curculigo orchioides Garzera., Curcuma indora Blatt., Habenaria marginata Coleb. Ophioglossum costatum (Schum.)

After the first half of August, grasses become quite tall and cover many plants growing among them. Some of the other plants also become conspicuous during this period besides the species mentioned above.

They are:

- *Abelmoschus manihot* (L.) Medic.
- *Acalypha indica* Linn.
- *Acalypha ciliata* Forsk.
- *Alvaicarnus longifolius* Wt. & Arn.
- *Elainvillea acmella* (L.) Philip.
- *Cassia abaus* Linn.
- *Cassia pumila* Lamk.
Corchorus ascutatus Linn.
Corchorus olitorius Linn.
Indigofera glandulosa Roxb. ex Willd.
Leea macrophylla Roxb.
Sida acuta Burm.f.
Sida cordifolia Linn.
Tacca leontopetaloides (L.) O.K.
Triumfetta rhomboidea Jacq.
Urrania picta Desv.

During this time Acanthospermum hispidum DC., Cassia occidentalis Linn., Cassia tora Linn., Celosia argentea Linn., Impatiens balsamina Linn., Xanthium strumarium Linn. also become dominant at various places forming dense patches in pure stands, encroaching upon the small herbaceous vegetation.

By the end of monsoon beginning of winter most of the above mentioned species disappear and other plants characteristic of cold season appear.

They are:

Achyranthes aspera Linn.
Aerva sanguinolenta (L.) Blume
Anisomeles indica (L.) O.K.
Barleria prattensis Sant.
Blumea lacera (Burm.f.) DC.
Blumea membranacea (Wall.) DC.
Blumea obliqua (L.) Druce
Diplautera verticillata Forsk.
Eranthemum roseeum (Vahl) R.Br.
Eragrostis spp.
Malachra capitata Linn.
Za Sorghum halense (Linn.) Pers.
Trichodesma zeylanicum (Burm.f.) R.Br.
Vernonia cinerea (Linn.) Less.
Vigna indica (Willd.) DC.

List of rare plants in the area:

Abelmoschus ficulneus (Linn.) Wight & Arn.
Adina cordifolia (Roxb.) Hook.f.
Ailanthus excelsa Roxb.
Albizia odoratissima Bth.
Andrographis achioides (Linn.) Nees.
Antidesma ghaesembilla Gaertn.
Aristolochia bracteolata Lamk.
Baliospermum montanum (Willd.) Muell.-Arg.
Blyxa echinosperma Hook.
Careya arbores Roxb.
Ceronegia bulbosa Roxb.
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Cissus adnata Roxb.
Cissus renana Lamk.
Cleome chelidonii Linn.f.
Crotalaria calycina Shrank
Crotalaria pana D. Don. Burm.
Crotalaria vestita Baker
Cyllaena scariosa Roxb.
Dalbergia latifolia Roxb.
Dicliptera roxburghiana Nees.
Diospyros melanoxylon Roxb.
Dunbaria glandulosa Prain
Ehrsta laevia Roxb.
Elaeodendron roxburghii Wight & Arn.
Evolvulus nummularius Linn.
Glossostigma diandrum (L.) O. Kuntze
Gravio disperma Roth
Habenaria gibsonii var. gibsonii Hook.f.
Helictotrichis isora Linn
Heliotropium indicum Linn
Hemigraphis latiflora Nees
Hibiscus lunariifolius Willd.
Hibiscus trionum Linn.
Holoptelea integrifolia (Roxb.) Planch.
Homoecia riparia Lour.
Indigofera hochstetteri Baker
Indigofera prostrata Willd.
Jaacarina anastomosana Wall.
Lannea coromandelica (Houtt.) Merrill.
Leea trifoliata Laws
Leucas martiniana R.Br.
Maytenus puberula (Lawson) Loes.
Medicago hispida Gaertn.
Melia composita Willd.
Melothria nervilis anct. (non.cogn.)
Merrania tridentata (L.) Hall.f.
Mimosa hamata Willd.
Moghanania strobilifera (Linn.) St. Hil. ex.Jacks.
Oxeyeia oleininas (Roxb.) Hochreut.
Patalidium barlericodes Nees
Pimpinella candolleiana Wight & Arn.
Polycarpon prostratum (Forsk.) Aschers & Schweinf.
Paterocarpus marauipium Roxb. var. acuminatum Prain
Pueraria tuberosa (Roxb.) DC.
Rhizophora mucronata Lamk.
Rhynchosia rothii Benth. ex. Aitch.
Rotala indica Willd.
Statistical Data

The following table shows comparative account of the number of species in the area under study.

<table>
<thead>
<tr>
<th>Group</th>
<th>No. of Species</th>
<th>No. of Genera</th>
<th>No. of Families</th>
<th>% of the total no. of species collected</th>
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</thead>
<tbody>
<tr>
<td>Polypetalae</td>
<td>339</td>
<td>208</td>
<td>65</td>
<td>38.00</td>
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<tr>
<td>Gamopetalae</td>
<td>284</td>
<td>192</td>
<td>26</td>
<td>32.00</td>
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<tr>
<td>Apetalae (Monochalamydeae)</td>
<td>100</td>
<td>60</td>
<td>17</td>
<td>11.00</td>
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<tr>
<td>Monocotyledonae</td>
<td>173</td>
<td>115</td>
<td>29</td>
<td>19.00</td>
</tr>
<tr>
<td>Total</td>
<td>896</td>
<td>575</td>
<td>37</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Of the 896 species 191 (21.5%) are cultivated as crop plants, ornamentals in the garden and avenue trees along road sides etc. and 705 species wild.

Dicotyledons—total species 723 i.e. 81.0%

Monocotyledons—total species 173 i.e. 19.0%
From the above table it is very clear that the dicotyledons dominate the vegetation and among the dicotyledons Polypetalae is dominant.

Following the example of Hooker in *Sketch of the flora of British India* 1:6, 1904 and C.E.C. Fisher in *Gamble's Flora of Madras Presidency* (p: XIV, 1957, reprinted) who have listed the ten most abundant families for India and Madras Presidency respectively, I have prepared a similar list for the present area.

<table>
<thead>
<tr>
<th>Order of families</th>
<th>No. of species in the area (present)</th>
<th>Hooker's order for India</th>
<th>Fischer's order for Madras</th>
<th>Santapau's order for Khandala</th>
<th>Rao's order for Dangs</th>
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<tbody>
<tr>
<td>1. Leguminosae</td>
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<td>21</td>
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<td>3. Convolvulaceae</td>
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<td>4. Compositae</td>
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<td>5. Acanthaceae</td>
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<td>6. Euphorbiaceae</td>
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<td>7. Cyperaceae</td>
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<td>8. Scrophulariaceae</td>
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<td>9. Malvaceae</td>
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<td>10. Amaranthaceae</td>
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