9 - SYSTEMATIC TREATMENT
OF
THE FLOW
ARTIFICIAL KEY TO FAMILIES

Leaves reticulate veined; flowers 4-5
merous, rarely 3-merous; seeds with 2-
estyledens ........................... 1
Leaves mostly parallel veined; flowers
3-merous, seeds with 1-styleden ......... 131

1. Petals present .......................... 2
   Petals absent .......................... 127

2. Petals free ............................ 3
   Petals fused .......................... 75

3. Sepals mostly distinct, free from
   superior ovary ......................... 4
   Sepals mostly connate, adnate to
   inferior ovary (ovary if not clearly
   inferior then monocarpellary) ....... 48

4. Thalamus well developed in the form
   of a torus ........................... 5
   Thalamus expanded, in the form of
   a disc ............................... 31

5. Flowers bisexual, carpels many, free,
   stamens many .......................... 6
   Flowers bi- or unisexual, carpels
   few, free or connate, stamens few or
   many ................................... 10

6. Aquatic, amphibious or terrestrial
   herbs .................................... 7
   Terrestrial trees or shrubs .......... 8
7. Amphibious or terrestrial herbs; leaves segmented; petals not more than 5 .............................. I- Ranunculaceae

Aquatic herbs; leaves not segmented; petals numerous .............................. VI- Nymphaeaceae

8. Fruits enclosed in thickened and enlarged sepals .............................. II- Dilleniaceae

Fruits not so enclosed .............................. 9

9. Stipule convoluto, leaving annual scar on the petiole .............................. III- Magnoliaceae

Stipules none .............................. IV- Annonaceae

10. Flowers unisexual; carpels free, climbers .............................................. V- Menispermaceae

Flowers bisexual or unisexual, carpels fused .............................. 11

11. Trees, woody shrubs or woody climbers .............................................. 12

Herbs .............................................. 20

12. Placentation parietal .............................. 13

Placentation axile .............................. 17

13. Gynophore none .............................. 14

Gynophore present .............................. 16

14. Sepals 4-5; stamens many, free .............................. XII- Flacourtiaeaceae

Sepals 5; stamens not more than 15, variously adnate .............................. 15

15. Seeds pilleae; shrubs with scaly leaves .............................. XVI- Tamaricaeae
Seeds not pilose; leaves well developed resinous trees ........................ XVII- Dipterocarpaceae

16. Gymnophoe present; leaves 3-foliate  
or simple ........................... X- Capparaceae

17. Stem covered with conical based  
prickles; sepals very thick, lustrous  
inside; stamens polyadelphous; seeds  
cottony ............................... XX- Bombacaceae  
Stem smooth; sepals not as above;  
seeds not cottony ...................... 18

18. Staminode none .......................... 19  
Staminodes present ....................... XXI- Sterculiaceae

19. Bracteoles oblong-spathulate; flowers  
white; petals without a rim of hairs  
at the base ............................... XIX- Malvaceae  
Bracteoles none; flowers yellow;  
petals with a rim of hairs at the  
base ................................. XXII- Tiliaceae

20. Flowers zygomorphic .................. 21  
Flowers actinomorphic .................. 23

21. Stamens 2, tripartite; leaves  
dissected; fruits single seeded ...... VIII- Fumariaceae  
Stamens more than 2; leaves not  
dissected; fruits many seeded ...... 22

22. Stamens 5; seeds not strophiolate;  
petals usually spurred .................. XI- Violasceae  
Stamens 8; seeds strophiolate;  
petals usually not spurred ............ XIII- Polygalaceae

23. Placentation parietal .................. 24  
Placentation axile or free central .. 26
24. Stamens tetradynamous or 2; plants with a characteristic smell of thiocyanate compounds; petals 4; cruciform ......................... II- Brassicaceae
Stamens 6 (all equal) to many; corolla not cruciform .................. 25

25. Herbs with glandular hairs or spinous stipules, without latex;
gynophore usually present ................. X- Caprifoliaceae
Herbs with spines all over body or glabrous or hairy, with latex;
gynophore none ............................ VII- Papaveraceae

26. Placentation axile ....................... 27
Placentation free; central .................. 30

27. Stamens monadelphous .................... 28
Stamens free ............................... 29

28. Anthers 1-celled; staminodes none .... XIX- Malvaceae
Anthers 2-celled; staminodes present or absent ........................ XXI- Sterculiaceae

29. Stamens 15 or more ..................... XXII- Iliaceae
Stamens 5 ................................ XVII- Elatinaceae

30. Sepals 2; leaves fleshy; fruits
circumscissile ............................. XV- Portulacaceae

31. Tree or shrub .......................... 32
Climber or herb ............................ 41
32. Fruits single seeded .................. 33
    Fruits more than 1-seeded ............. 36
33. Leaves simple .......................... 34
    Leaves pinnately compound ............. 36
34. Armed shrubs or trees ................... XXXII- Rhamnaceae
    Unarmed .................................. 35
35. Flowers bisexual; perfect stamen 1;
    fruits fleshy ............................ XXXV- Anacardiaceae
    Flowers unisexual; stamens all
    perfect; fruits winged (a shrub)
    or wingless (a tree) .................... XXXIV- Sapindaceae
36. Filaments connate to form a tube ....... XXI- Liliaceae
    Filaments free .......................... 37
37. Fruits winged ............................ XXIX- Limaroubaceae
    Fruits not winged, either with
    translucent flesh/pulp or pericarp
    with saponins ............................ XXXIV- Sapindaceae
38. Fruits dry ............................... 39
    Fruits juicy ............................. 40
39. Leaves simple; flowers regular;
    fruits globular; seeds 3-6,
    arillate ............................... XXXI- Calastraceae
    Leaves compound; flowers irregular;
    fruits elongated; seeds winged ...... XXXVI- Moringaceae
40. Leaves not gland dotted; fruits
    acutely 3-angled ........................ XXIV- Ocblidaceae
    Leaves, petals and fruits gland
    dotted; fruit smooth .................... XXVII- Rutaceae
41. Climbers ........................................... 42
Herbs .............................................. 44

42. Tendrils present; flowers in leaf
opposed gymo .................................. XXXIII- Vitaceae
Tendrils present or absent;
flowers not in leaf opposed
Gymo ................................................. 43

43. Tendrils present; fruits inflated;
seeds 3, with a heart shaped white
aril ................................................. XXXIV- Sapindaceae
Tendrils absent; fruits with a
single apical wing; seed f .......... XXXII- Rhamnaceae

44. Fruits with 6-9 spines; leaves
pinnate ............................................. XXIV- Cygophyllaceae
Fruits not spiny; leaves simple
or compound ....................................... 45

45. Flowers spurred, nygomorphic ............ 46
Flowers not spurred, actinomorphic .... 47

46. Leaves peltate, long petioled;
capsule indehiscent, 3-seeded ....... XXVI- Tropaeolaceae
Leaves lanceolate; petiole short;
capsule bursting elastically, many
seeded ............................................. XXVII- Balsaminaceae

47. Leaves pinnately or digitately
compound ........................................... XXV- Oxlidaceae
Leaves simple .................................... XXIII- Linaceae

48. Petals present .................................... 49
Petasus absent ........................................... 69 (every not necessarily inferior)

49. Gynoecium made up of single carpel ... 50
   Gynoecium made up of more than one
   carpel .................................................. 52

50. Corolla papilionaceous; stamens 1 or
   2-adephous, never exerted ........... XXXVII- Fabaceae
   Corolla not as above; stamens free .................................................. 51

51. Flowers sygomorphic; posterior petal odd; staminodes usually present .. XXXVIII- Caesalpiniaceae
   Flowers actinomorphic; stamens 4-many; staminodes none; stamens
   as a rule exerted ................................... XXXIX- Limosaceae

52. Carpels free ........................................... 53
   Carpels fused ......................................... 55

53. Carpels more than 5; stipules
   adnate to the petiole; small
   prostrate herbs, thorny shrubs
   or climbers ........................................... XL- Rosaceae
   Carpels not more than 5; stipules
   not adnate ............................................ 54

54. Small prostrate herbs; stamens 5,
   not epipetalous ..................................... LII- Heltinginaeae

55. Trees and shrubs ................................. 56
   Climbers and herbs ................................. 61

56. Fruits juicy when ripe ...................... 57
   Fruits dry when ripe ............................... 60
57. Placentation marginal or axile ....... 58
Placentation parietal ................. 59

58. Leaves stipulate; corolla roseaceous;
fruits green to orange, if more than
one seeded then with a cartilaginous
decarp .................................. XL- Rosaceae
Leaves extipulate; corolla
calyptrous; fruits deep purple,
single seeded or whitish-yellow
with numerous small seeds .......... XLII- Myrtaceae

59. Small laticiferous trees, dioecious;
leaves palmatifid; petiole
very long, fluted; stamens 10 in
2 bundles; fruits without
leathery pericarp ..................... LI- Caricaceae
Medium sized, non laticiferous
trees; flowers bisexual; leaves
shortly petiolate, entire; stamens
many; fruits with leathery
pericarp .................................. XLIV- Punicaceae

60. Petals crumpled in the bud; leaves
not gland dotted (if gland dotted,
then the glands red and leaves
white velvety beneath) ....... XLIII- Lythraceae
Petals not crumpled, calyptrate
or not; leaves gland dotted ........ XLII- Myrtaceae

61. Herb .................. 62
Climbers .......................... 66
62. Aquatic herbs .......................... 63
Terrestrial or amphibious .............. 64

63. Leaves nearly whorled, long
petiolate; float none; fruits
with 2 spines ......................... XLVII - Trapaceae
Leaves alternate, short
petiolate; float white, spongy;
fruits not spiny ...................... XLV - Onagraceae

64. Odoriferous plants; flowers in
simple or compound umbels; fruit
a carpocarp made up of 2 mericarps,
each mericarp 1-seeded .............. LIV - Apiaceae
Non odoriferous plants; flowers not
in umbels; fruit usually many seeded
capsule ........................................ 65

65. Petals crumpled in bud stage ...... XLIII - Lythraceae
Petals not crumpled in bud stage ...... XLV - Onagraceae

66. Leaves reduced; stem modified in
to phyllotoma, glochidia present ... XLIX - Cactaceae
Leaves normal; stem not as above,
glochidia none .............................. 67

67. Tendril climbers ...................... 68
Tendriis none; leaves entire,
opposite; flowers in pendulous
corymbs; calyx tube narrow and
elongated ....................................... XLI - Cumbretaceae

68. Ovary seated on a gynophore;
carpels 2-4 seriate; stamens free ...... L - Passifloraceae
Ovary not seated on a gynophore;

the flower none; stamens synadelphous .. XLVII- Cucurbitaceae

69. Trees .................................................. 70
Herbs .................................................. 73

70. Flowers hypogynous .................. 71
Flowers epigynous; a hairy disc
present between androecium and
gynoecium; fruits drupaceous ........ XLII- Combretaceae

71. Disc none; stamens 15-many, a
spinous tree .............................. XII- Flacourtiaceae
Disc present or absent; stamens
not more than 10, unarmed trees
or shrubs ...................................... 72

72. Disc present; stamens not more
than 10, flowers bisexual,
unisexual or polygamous ............. XXXIV- Sapindaceae
Disc none; stamens 8; flowers
all bisexual; hairy scale like
staminodes present ...................... XLVIII- Samyaceae

73. Plants with smell of sulphur
compound; stamens only 2; fruit
a 2-seeded silicle, prostrate
or ascending herbs with dissected
leaves ................................. IX- Brassicaceae
Plants without such smell; stamens
more than 2 ....................... 74

74. Ovary superior; capsule 3-5 valved;
apex of fruit neither depressed nor
transverse .............................. LII- Molluginaceae
Ovary inferior or semi-inferior; capsule 1-2 celled, often with depressed or truncate apex .......... LIIL- Aizoaceae

75. Ovary superior .............................. 82
    Ovary inferior .............................. 76

76. Flowers in capitulum; stamens
    syngenesious .............................. LVI- Asteraceae
    Flowers not in capitulum;
    stamens not as above ..................... 77

77. Herbs ...................................... 78
    Shrubs and trees ........................... 81

78. Leaves opposite; stipules inter-petiolate .............................. LV- Rubiaceae
    Leaves alternate; stipules none ...... 79

79. Flowers unisexual, male above, female below in the inflorescence,
    bisexual once sterile; filaments united; fruits covered with
    hooked spines .............................. LVI- Asteraceae
    Flowers all bisexual (some cleistogamous in Campanulaceae) .......... 80

80. Flowers sessile, in compact spikes, white ............................. LVIII- Sphenocleaceae
    Flowers short or long pedicelled,
    in panicles, pink or white .......... LVII- Campanulaceae

81. Leaves whorled or opposite;
    stipules interpetiolar; flowers in
cymes or solid globular heads ...... LV- Rubiaceae
| 82. | Trees and shrubs | 83 |
| 83. | Herbs and climbers | 92 |
| 84. | Plants with milky latex | 84 |
| 85. | Plants without milky latex | 85 |
| 86. | Corolla lobes up to 24, 2-serial; anthers not sagittate; ovary 6-8 celled; ovule 1 in each cell | LXI- Sapotaceae |
| 87. | Corolla lobes not more than 5, 1-serial; anthers often sagittate, corona present; ovary one or two celled | LXIV- Apocynaceae |
| 88. | Calyx with glutinose stalked glands; flowers white | LIX- Plumbaginaceae |
| 89. | Calyx without such glands | 86 |
| 90. | Flowers unisexual; stamnodes 12 in female flower | LXII- Ebenaceae |
| 91. | Flowers bisexual; stamnodes not more than 1 | 87 |
| 92. | Number of stamens 2; flowers actinomorphic | LXIII- Gileaceae |
| 93. | Number of stamens 2-4 (±3), if two then flower sygomorphic | 88 |
| 94. | Calyx and corolla lobes 4; flowers actinomorphic | LXVI- Loganiaceae |
| 95. | Calyx and corolla lobes usually 5; flowers sygomorphic | 89 |
| 96. | Fruit a capsule | 90 |
| 97. | Fruit of four nutlets | 91 |
90. Leaves compound; flowers with a staminate; bracts and bracteoles not prominent; capsule elongated without jasclators; seeds winged ... LXXVI- Bignoniaceae

Leaves simple; flowers with or without staminate; bracts and bracteoles prominent; capsule with jasclators; seeds never winged, usually seated on small hooks ...................... LXXIX- Acanthaceae

91. Inflorescence verticillaster;

style gynobasic ...................... LXXXI- Lamiaceae

Inflorescence, coxymbose, spike
or panicle; style terminal ........... LXXX- Verbenaceae

92. Flowers actinomorphic .......... 93

Flowers sygomorphic ............... 113

93. Milky or watery latex present ...... 94

Milky or watery latex absent ....... 96

94. Leaves alternate; corona absent;
carpoles united; seeds not more
than four ...................... LXXI- Convolvulaceae

Leaves opposite; corona present;
carpoles partially united .......... 95

95. Pollen grains free ............ LXXIV- Apocynaceae

Pollen grains forming pollinias ..... LXXV- Asclepiadaceae

96. Placentation free central .......... LXX- Primulaceae

Placentation other wise ........... 97
97. Leaves alternate ........................ 98
Leaves opposite or radical .......... 99

98. Plants densely hispidly hairy;
flowers sessile; inflorescence
scrofuloid (solitary in *Irissetacea*
but there the calyx lobes are
hastate at the base); fruits with
2-4 seeds .............................. LXX- Beraginaceae
Plants glabrous or softly hairy;
flowers in axillary cymes; calyx
accrescent; placenta swollen and
oblique; fruit a berry or capsule;
seeds numerous ....................... LXXII- Solanaceae

99. Leaves all radical, with several
parallel running nerves; flowers
in leafless spikes; petals
scarious; capsule circumscissile;
seeds peltate .......................... LXXXII- Plantaginaceae
Leaves all cauline or cauline
and radical both ...................... 100

100. Aquatic herbs ...................... 101
Terrestrial climbers or shrubs ... 102

101. Flowers white; filaments
short; every 1-celled; seeds
many ................................. LXVIII- Gentianaceae
Flowers pink, bell shaped;
filaments long; every 2-
celled; seeds 4 ....................... LXXI- Convolvulaceae
102. Climbers ................................. 103
Herbs ........................................ 105

103. A herbaceous or slightly woody
climber; leaves alternate, entire
or palmatifid; flowers without
corona; capsule 2-celled;
4-seeded ...................................... LXXI- Convolvulaceae

Woody climbers; leaves opposite,
entire; flowers with corona;
fruits consisting of two diver-
gent follicles ................................. 104

104. Pollinia absent ........................... LXIV- Apocynaceae
Pollinia present ............................. LXV- Asclepiadaceae

105. Flowers actinomorphic ............... 106
Flowers zygomorphic ..................... 113

106. Leaves opposite; inflorescence
forked; flowers tetramerous ......... LXVI- Spigoliaceae
Leaves opposite or alternate;
flowers pentamerous .................... 107

107. Leaves alternate; ovary
3-celled ...................................... LXIX- Polemoniaceae
Leaves opposite or alternate;
ovary 2 or 4 celled ..................... 108

108. Fruits four seeded .................... 109
Fruits more than four seeded .......... 110

109. Plants hispidly hairy;
inflorescence scorpioid .................. LXX- Boraginaceae
Plants not hispidly hairy; inflorescence often axillary; fruit a capsule, latex present .... LXXI- Convolvulaceae

110. Leaves alternate; calyx accrescent; flowers often in extra axillary cymes; placenta swollen and obliquely placed; fruit a capsule or berry .......... LXXII- Solanaceae

Leaves opposite; calyx not accrescent; fruit a capsule composed of two follicles .......... 111

111. Herbs without latex; flowers white or pink, corymbose, without corona; placentation usually parietal; fruit a single capsule ..LXVIII- Gentianaceae

Herbs with latex; flowers variously coloured; fruit composed of two divergent follicles .................... 112

112. Pellinia none .................... LXXIV- Aposemataceae

Pellinia present .................... LXV- Asclepiadaceae

113. Aquatic or marshy herbs ............ 114

Terrestrial or amphibious ............ 116

114. Leaves finely segmented; bladder present; flowers yellow with red bicolor .................... LXXV- Lentibulariaceae

Leaves well developed; bladder none .................... 115
115. Erect herbs with axillary
spines; leaves not gland
ed; capsule 4–8 seeded .......... LXXIX–Acanthaceae
Prostrate herbs with fleshy
gland dotted leaves; capsule
many seeded ......................... LXXIII–Scrophulariaceae

116. Climbers ........................ 117
Herbs ............................... 118

117. Flowers orange or yellow; stami-
node present; seeds, if present, 
winged ............................. LXXVI–Bignoniaceae
Flowers red; staminode none ...... LXXX–Verbenaceae

118. Corolla rotate or indistinctly
bilipped ............................ 119
Corolla distinctly bilipped ...... 121

119. Filaments or corolla throat
bearded ............................. LXXIII–Scrophulariaceae
Filaments not bearded .......... 120

120. Seeds supported on retinacula .... LXXIX–Acanthaceae
Seeds not supported on retina-
cula ................................. LXXIII–Scrophulariaceae

121. A parasitic plant with only
inflorescence above the ground ... LXXIV–Cochleareae
Non-parasitic or semiparasitic
(Stige) plants with vegetative
as well as reproductive parts
above ground ....................... 122

*Some members of this family fail to set fruits in this area.
122. Fruits with two stout, curved and sharp apical spines; plant glutinosse ......................... LXXVIII- Martyniaceae Fruits without such spines .......... 123

123. Petiole as well as pedicel with a pair of yellow glands at the base; fruits with or without four subapical straight spines .... LXXVII- Podaliaceae Petiole without such glands; fruits without any spine ............ 124

124. Seeds 4-many in each fruit, com- pressed or not ......................... 125 Seeds 4 in each fruit never comp-ressed .......................... 126

125. Seeds numerous in each fruit, never compressed; retinacula absent; anthers not appended .... LXXIII- Scrophulariaceae Seeds 4 to many in each fruit, compressed and seated on retina- cula; bracts and bracteoles conspicuous; anthers often appended ....................... LXXIX- Acanthaceae

126. Inflorescence verticillaster; style gynobasic .......................... LXXXI- Lamiales Inflorescence corymboso or spicate, style terminal ............... LXXX- Verbenaceae
127. Aquatic herbs with whorled
leaves, few of them forked;
flowers unisexual; perianth
9-12 lobed ........................................... C. Ceratophyllaceae
Terrestrial herbs, shrubs,
climbers or trees ...................... 128

128. Trees or shrubs ...................... 129
Herbs and climbers ..................... 136

129. Flowers bisexual or poly-
gamous ........................................... 130
Flowers unisexual ....................... 132

130. Leaf buds enclosed in scales,
leaves with smell of camphor ...... XG. Lauraceae
Leaf buds not so enclosed,
no smell ........................................... 131

131. Spiny shrubs, leaves not incised;
each flower subtended by a leaf
like, showy bract; ovule 1, basal..LXXXIII- Nyctaginaceae
Tree, leaves incised and silvery
beneath; flowers orange, secund,
in racemes; ovary with 2 parietal
ovules ........................................... XCL- Proteaceae

132. Leaves none; branchlets cylindrical, longitudinally ribbed; fruit
a samara aggregated into woody
corne like structure .....................XCVIII- Casuarinaceae
Leaves well developed .................... 133
<table>
<thead>
<tr>
<th>133.</th>
<th>Flowers dioecious; capsule many seeded; seeds long hairy at one end</th>
<th>[XCIX- Salicaceae]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Seeds not more than 6 per fruit, not with long hairs</td>
<td>[134]</td>
</tr>
<tr>
<td>134.</td>
<td>Inflorescence a catkin or hypan-thodium; fruit aggregate</td>
<td>[XCV- Icacinaceae]</td>
</tr>
<tr>
<td></td>
<td>Inflorescence not a catkin; fruit not aggregate</td>
<td>[135]</td>
</tr>
<tr>
<td>135.</td>
<td>Fruit 2-winged, single seeded, nearly orbicular samaras; no latex</td>
<td>[XCVI- Ulmaceae]</td>
</tr>
<tr>
<td></td>
<td>Fruit a 3-seeded capsule or berry; plant often with latex</td>
<td>[XCVII- Euphorbiaceae]</td>
</tr>
<tr>
<td>136.</td>
<td>Herbs</td>
<td>[137]</td>
</tr>
<tr>
<td></td>
<td>Climbers</td>
<td>[148]</td>
</tr>
<tr>
<td>137.</td>
<td>Epiphytic, partial parasite with orange-red clustered flowers and leathery leaves</td>
<td>[XCVII- Loranthaceae]</td>
</tr>
<tr>
<td></td>
<td>Autotrophs</td>
<td>[138]</td>
</tr>
<tr>
<td>138.</td>
<td>Perianth petaloid</td>
<td>[139]</td>
</tr>
<tr>
<td></td>
<td>Perianth sepaloid</td>
<td>[142]</td>
</tr>
<tr>
<td>139.</td>
<td>Flowers unisexual; ovaries 3-celled; fruit a capsule; plants often with latex</td>
<td>[XCVII- Euphorbiaceae]</td>
</tr>
<tr>
<td></td>
<td>Flowers bisexual or polygamous; every 1-celled; fruits indehiscent or dehiscent; no latex</td>
<td>[140]</td>
</tr>
</tbody>
</table>
140. Perianth plicate in bud; stamens
more or less exerted .................. LXXIII- Nyctaginaceae
Perianth not plicate in bud;
stamens not exerted .................. 141

141. Stipules none; perianth dry
(fleshy and red in Dicera);
flowers bisexual or polygamous
in spike, panicle or axillary
clusters ............................... LXXIV- Amaranthaceae
Stipules ochraceo; perianth
not dry ............................... LXXVII- Polygonaceae

142. Flowers bisexual ..................... 143
Flowers unisexual ..................... 146

143. Ochrea present ....................... LXXVII- Polygonaceae
Ochrea absent ........................ 144

144. Bracts peltate; seeds warty; a
flaccid herb with punctate
leaves ................................. LXXXIX- Piperaeae
Bracts not peltate; leaves
not punctate .......................... 145

145. Perianth lobes scarious; plant
neither mealy tomentose nor with
smell .................................... LXXXIV- Amaranthaceae
Perianth lobes green; plant
mealy tomentose or with aromatic
smell ................................. LXXXV- Chenopodiaceae
146. Plants dioecious; leaves palmatifid lobes lanceolate and crenate-serrate .................................. XCVII- Cannabaceae
Plant monoecious .......................................................... 147

147. Fruit 3-seeded capsule, not
winged ................................................................. XCIIL- Lapiiceriaceae
Fruit 1-seeded achene with 2-3 small wings ...................... XCIV- Urticaceae

148. An armed climber each flower
subtended by a coloured leaf
like bract ............................................................... LXIII- Rhamnaceae
unarmed ................................................................. 149

149. Flowers sygomorphic; perianth
bent twice like 'S'; throat hairy; fruit beaked ................. LXCVIII- Aristolochiaceae
Flowers not as above ................................................. 150

150. Terminal portion of the
infloraeence modified into
tendril; flowers pink or white;
leaves not fleshy ................................................. LXCVIII- Polygonaceae
Terminal portion of the
infloraeence not modified into
tendril; flowers red; perianth
fleshy; leaves fleshy .............................................. LXCVII- Basellaceae

151. Aquatic plants .................................................. 152
Terrestrial or marshy ................................................ 157

152. Ovary inferior .................................................. CI- Hydrocharitaceae
Ovary superior ........................................................ 153
153. Plant body consisting of only a frondlike structure, with or without roots .......................... CXVII- Lemnaceae
Plant body well developed .............. 154

154. Leaves filiform; flowers without perianth; stamen 1 ..................... CXVI- Zannichelliaceae
Leaves broad; perianth present;
stamens more than 1 .................... 155

155. Leaves dimorphic, submerged ones membranous and longer, floating ones relatively thicker and shorter;
flowers in dense spikes ................... CXIX- Potamogetonaceae
Leaves not as above ...................... 156

156. Flowers blue; carpels united;
inflorascence emerging from
the leaf sheath ............................. CX- Pontederiaceae
Flowers white; carpels free .......... CXVII- Alismataceae

157. Flowers unisexual or bisexual;
inflorascence subtended by well
developed spathe ......................... 158
Flowers uni- or bisexual without
spathe ..................................... 160

158. Flowers bisexual .......................... 159
Flowers unisexual .......................... 160

159. Large, erect tree like herbs with pseudostem and large rhizomes;
leaves long petioloed; spathe bright red; inflorascence drooping ............ CIII- Musaceae
Small creeping herbs; stem true; leaves sessile, sheathing; bracts spathaceous; flowers blue .............. CXI- Commelinaceae

160. Herbs with underground stem and radical sagittate or hastate leaves; young leaf rolled up; if climber then the leaves variegated or segmented and with clinging roots ......................... CXVI- Araceae

Trees with woody stem; leaves forming a crown, young leaves plicate .................................................. CXLII- Arecaceae

161. Perianth petaloid .......................... 162
Perianth sepaloid (petaloid in some Agavaceae) ................. 171

162. Plants without underground stem; filaments usually bearded; ovary superior ........................................... CXII- Commelinaceae
Plants with underground stem; ovary inferior or superior ........... 163

163. Erect herbs .................................. 164
Climbers ........................................... 170

164. Leaves 2-ranked, sword shaped and equitant ......................... CVI- Iridaceae
Leaves three ranked, and expanded or fistular .......................... 165

165. Ovary superior ................................ CIX- Liliaceae
Ovary inferior ................................... 166
166. Fertile stamen 1 ...................... 167
    Fertile stamens more than 1 ........ 169
167. Stamnodes petaloid; pollinia
    absent .......................... 168
    Stamnodes none; pollinia present .. CII- Orchidaceae
168. Leaves ligulate, whole plant or
    at least the rhizome aromatic ....  CIV- Zingiberaceae
    Leaves not ligulate: plants
    not aromatic ........................ CIV- Cannaceae
169. Fertile stamens 6; underground
    stem usually a tunicated bulb ...... CVII- Amaryllidaceae
170. Leaf apicose transformed into
    tendrils .......................... CIIi- Liliaceae
171. Leaves fleshy with or without
    spines on margins .................. 172
    Leaves not fleshy ................... 173
172. Perianth none; stamens 1-numerous;
    large shrub with a number of stilt
    roots and spinose margined droop-
    ing leaves ......................... CIXIV- Pandanaceae
    Perianth present; stamens 6; stilt
    roots none; leaves smooth or spin-
    ous margined, usually straight;
    inflorescence often with inter-
    mingled bulbs ...................... CVII- Agavaceae
173. Large marshy herbs; flowers unisexual in a compact spike, male flowers occupying the upper portion and female lower, with a gap between the two; seeds subtended by white or brown bristles

Seeds not subtended by bristles .... 174

174. Ovary many ovuled; perianth

6-partite ..........................  CXII- Juncaceae

Ovary not more than 3-ovuled .... 175

175. Fruit a 3-celled loculicidal capsule; flowers in rounded heads; anthers block ............... CXXI- Eriocaulaceae

Fruit 1-celled and 1-seeded ........ 176

176. Leaves 3-ranked; ligule none;

scape often triangular; fruit a biconvex or trigonous nut ....... CXII- Cyperaceae

Leaves 2-ranked; ligule present;

scape usually cylindrical; fruit a caryopsis .......................... CXIII- Poaceae
I. **RANUNCULACEAE**

Key to genus:

Leaf segments broad; flowers actinomorphic, yellow; fruit an ovoid or oblong achenes ............ 1. *Ranunculus*

Leaf segments linear; flowers actinomorphic or zygomorphic fruit a follicle.

   Flower zygomorphic, blue .................. 2. *Consolida*
   Flower actinomorphic, greenish white .... 3. *Nigella*


Key to species:

Plant body glabrous .................................. 1. *R. sceleratus*

Plant body hairy ..................................... 2. *R. cantonensis*


An aquatic or amphibious glabrous herb, Stem fistular. Leaves irregularly lobed or 3-partite. Flowers terminal or leaf opposite. Petals shining yellow. Seeds without intramarginal rib.

A very common herb, found near the ponds, drains and other damp places.

Plants associated: *Alternanthera sessilis*, *Salvia anthemifolia*, *Cotula hexaphora*, *Petentilla supina* etc.

Flowering & Fruiting: November-March.
Ranunculus sceleratus Linn.
Ather 68, Bijnor Inter College, Bijnor.


*Ranunculus pensylvanicus* Hook. f. et Thoms. FBI. 1:19, 1872


The whole plant body hairy and colour of the plant dull and darker than the previous species. **Seeds** with a characteristic intramarginal rib.

Not uncommon, found in cool and damp places.

Plants associated: *Cahlenbergia marginata*, *Campanula wallichii*, *Rumex dentatus* and *Polygonum* sp.

Flowering & Fruiting: December-March.

Ather 242, Sharam Nagri road.

3. *Consolida* B. Gray


*Delphinium ajacis* auct. Pl. (non-Linn. 1753).

*Consolida ajacis* auct. pl. (non Schur. 1853).

A very common garden plant. **Leaves** decussate, segments linear, base sheathing; upper leaves sessile. **Flowers** blue in simple raceme, zygomorphic; posterior sepal spurred. **Stamens** 12-15, filaments slightly flattened at the base. **Seeds** black, trigonous with transverse ridges.
Cultivated as an ornamental, sometimes found as escape.

Flowering & Fruiting: January–April.

Athar 480, Municipal Park.

3. Nigella Linn.


A glabrous, much branched annual. Flowers solitary terminal, white or light blue, surrounded by a very finely cut involucre. Fruit united to the top, making a globular-oblung, inflated capsule.

Cultivated as an ornamental.

Flowering & Fruiting: February–May.

Athar 500, Nehru Sports Stadium.
Juenenia indica Linn. sp. 1, 535, 1753; 381, 1:36, 1875; rdb.

Juenenia speciosa Thumb. in Trans. Linn. Soc. Lond. 1:200, 1791;
light Icon. t. 623, 1844-45; Dced. ill. Sylvat. t. 103, 1871.

A medium sized tree; crown nearly spherical. dark reddish brown or
grey. Leaves oblong lanceolate, sharply serrate, glabrous above,
pubescent beneath; confined to the ends of branches. Flowers
solitary terminal. Sepals 9, fleshy, concave, persistent and
accrescent. Petals 9, white; margins slightly fringed. Stamens
numerous; anthers linear. Carpels 15-40, many ovuled, cohering with
the axis. Fruit large, ball like, enclosed by the persistent sepals.
Leaves reniform, embedded in the pulp.

Planted as an ornamental.

Flowering & fruiting: November-May.

Ather 512, S.S. Sugar Hills.
III- MAGNOLIACEAE

*Michelia* Linn.

**Michelia champaca** Linn. Sp. pl. 536, 1753; Rgl. 1:42, 1875; Brandis, Ind. fl. 8, repr. ed. 1971; Talbot, For. Fl. 1:13, 1909; Rgl. 3, 1978.

**Michelia aurantiaca** Wall. Fl. As. Nav. 2:39, 1830.


Flowering & fruiting: April-August.

Planted in gardens. The flowers, when put in water, emit a very pleasant fragrance.

Athal 266, P. J. B. Inspection House.
IV- ANNONACEAE

Key to genera:

Fruit a fleshy syncarp; petals with a purple dot at the base ............................ 1. Annona

Fruit a cluster of berries or drupelets;
petals without purple spot at the base.

Leaf margins undulated; fruit a cluster of drupelets ................................. 2. Polyalithia

Leaf margins not undulated; fruit a cluster of berries .............................. 3. Artabotrys

1. Annona Linn.

Annona squamosa Linn. Sp. pl. 2: 337, 1753; Fl. Del. 1: 78, 1875; F.J.C.

Small glabrous tree. Leaves oblong-lanceolate, yellowish-punctate with a characteristic smell. Flowers pedicelled, drooping, greenish-yellow. Sepals 3. Petals 6, outer three well developed; inner minute or absent. Stamens numerous, with connective broad and truncate. Fruits globose, tubercled, with a peculiar smell. Seeds black, smooth; embedded in creamy sweet pulp.

A common tree, usually planted near Churches.

Flowering & Fruiting: March-October.

Athar 267, Catholic Mission Compound, Bijnor.


*Cutteria longifolia* Hall. ex L. & Arn. Prodr. 10, 1834.

A tall straight and globrous tree. **Crown** pyramidal. **Leaves** long, lanceolate, acuminate, undulate, shining-green above. **Flowers** cauliforous, yellowish-green, unbellate. **Sepals** 3, broadly ovate, acuminate; tips reflexed. **Petals** 6, biserrate, spreading, narrow, lanceolate, acuminate. **Stamens** numerous; anthers subsessile. **Fruit** a cluster of drupeslets.

A common avenue tree, often trimmed to various shapes.

**Flowering & Fruiting:** April-August.

Athisar 481, Municipal Park, Bijnor.

3. *Artabotrys* R.Br.


*Artabotrys odoratissimus* R.Br. ex Ker. in Bot. Reg. 5, t. 423, 1820; PBI. 1:54, 1872.

Large shrub; young branches puberulous. **Leaves** oblong or oblong-lanceolate, acuminate, short petioled. **Flowers** on hooked peduncles,

**Flowering & Fruiting:** July-January.

Athar 180, F.M.E. Inspection House, Bijnor.
V. MENISPERMACAE

Key to genera:

Male flowers in fascicled cymes; stems without aerial roots.

Female flowers without foliaceous bracts ........................................ 1. Cocculus

Female flowers with foliaceous bracts ........................................ 2. Cissampelos

Male flowers in racemes; stems often with aerial roots ..................... 3. Tinospora

1. Cocculus DC.


A climbing under-shrub; branchlets, leaves and inflorescence clothed with greyish hairs. *Leaves* petiolate, ovate, obovate or ovate-oblong, occasionally three lobed; abaxial surface more villous than adaxial, entire, base subcordate or truncate, 3-nerved. Male flowers in 3-6 flowered, short, axillary cymes which run into a panicle. *Sepals* 6 (3+3), usually auricled and with notched apex. *Stamens* 6, filaments very short; anthers subglobose. In female flowers the carpels not embraced by petals. *Carpels* 3, free; styles curved outwardly. *Drupe* purple.
A very common climber, found climbing on a variety of plants, e.g. *Capparis sepiaria*, *Zizyphus oenoplia*, *Carissa opaca*, *Saccharum spontaneum* and *Phoenix humilis*.

Flowering & Fruiting: November-May.

Athan 49, Jhalu Road.

2. *Cissampelos* Linn.


A slender, extensive climber. Leaves usually peltate, palmately nerved, reniform or cordate. Male flowers yellowish in cymose clusters. Sepals 4, free. Petals 4, connate, cupular. Staminodes 4, columnar, synandrous. Female flowers in axillary racemes; bracts foliaceous; sepal and petal 1 each. Carpels 1, pilose; style 1; stigma 3-lobed. Berpes scarlet-red. Endocarp transversely ridged and tuberculate.

A very common climber on hedges.

Flowering & Fruiting: August-December.

Athan 134, Jhalu Road, Hemrajpur Colony.

3. *Tinospora* Miers

Tinospora cordifolia (Willd.) Miers

A. Flowering & Fruiting twig, B. Female flower, C. Male flower, D. Stamen with petal, and E. Petal.
Tinospora cordifolia (Willd.) Miers

Cocculus convolvulaceus L. Syst. Veg. 1:518, 1817; Prodr. 1:97, 1824.


Cocculus verrucosus (Roxb. ex Fleming) Will. Cat. 4966 (1830) pro parte excl. basionymus ot-4966A & B sed quoad 4966C, D & E.

I. convolvulacea (L.) B & L. Jackson, Index Kew. 2(4):1083, 1895

[nomen in synonym.]

A large deciduous climber. Stem striate, pale-brown, bearing slender adventitious aerial roots; quite bitter in taste. Leaves cordate, petiolarate; petiole swollen at the base; lamina glabrous. Flowers yellow, raceme or panicle axillary or terminal, unisezial. Sepals 6 (3+3), 3 outer minute, 3 inner larger. Petals 6, free. Stamens 6; anther cells oblique and oblong. Carpels 3-10, borne on a fleshy receptacle; style subulate. Drupes compressed, red.

Often found climbing on Mangifera indica, Syzygium cumini and
Azadirachta indica. The flowers appear before the emergence of new leaves.

Flowering & Fruiting: April–June.

Leaf Fall: February–March.

Athar 83, Near Jalalpur.
VI.- Nymphaeaceae

Key to genera:

Leaves with a basal sinus; seeds not embedded in a torus ..................................... 1. Nymphaea
Leaves without a basal sinus; seeds embedded in a torus ..................................... 2. Nelumbo

1. Nymphaea Linn.

Key to species:

Leaves entire; calyx not ribbed; apical appendage of the anthers usually acute ...... 1. N. stellata
Leaves toothed; calyx ribbed; apical appendage of the anthers usually absent ...... 2. N. noouchali


Annual, aquatic herb with a subterranean, erect, fleshy rootstock. Leaves elliptic or orbicular, peltate, sinuate at the base, glabrous, green above and purple beneath. Flowers blue, purplish or white.


A very common aquatic herb.

Flowering & Fruiting: August-November.
Ather 9, Muzaffar Nagar Road.


*Nymphaea rubra* Hook. f. & Thoms. FBI. 1:114, 1872; (non Linn. 1753).


*Nymphaea lotus* var. *pubescens* Hook. f. & Thoms.


Abundant in ponds, ditches and temporary water bodies during rainy season.

Flowering & Fruiting: August–October.

Ather 4, Chandpur.

2. *Nelumbo* Adans.


An aquatic herb with creeping rhizome. **Leaves** orbicular, raised above the surface of water, without sinus at the base, entire. **Flowers** solitary-axillary, raised above water surface, white or pink. **Sepals** 4-5, caducous. **Petals** many, free, obovate, spreading. **Stamens** numerous; anthers with a club shaped appendage at the apex. **Carpels** 15-25, free, sunk in a large fleshy torus. **Fruit** consisting of fleshy, obconic, receptacle, in which carpels are embedded.

Not uncommon within the area. Often met with in ditches, ponds and streams.

**Flowering & Fruiting:** March-December.

Athar 474, Chhitawar Jhil.
VII- PAPAVERACEAE

Key to genera:

Erect herbs; capsule short, opening by apical pores; latex milky or yellow.

whole the plant spinous; flowers very shortly pedicelled; yellow or whitish yellow .................................................. 1. Argemone

Plant hairy, not spinous; flowers long pedicelled; bud nodding; flowers red, pink or white ............................. 2. Papaver

Spreading herbs; capsule conical, opening by valves; latex watery; flowers orange ...... 3. Eschscholtzia

1. Argemone Linn.

Key to species:

Flowers bright-yellow; bud sub-spherical;
stigma broad, not spreading widely ............ 1. A. mexicana

Flowers lemon-yellow; bud oblong; stigma narrow, spreading widely .................... 2. A. ochroleuca


A large spiny herb, mostly unbranched; latex yellow. Leaves lower petioled, upper ones sessile and semiamplexicaul, sinuate,

Abundant throughout the area, nearly in every type of soil.

Flowering & Fruiting: Late winter and summer.

Athan 482, Jain Farm Bijnor.


The taxon may be distinguished from A. mexicana by its lemon-yellow flowers. Bhalotra (1960) has shown it to be cytologically distinct species, being octoploid.

Not uncommon, grows in association with A. mexicana.

Athan 483, Jain Farm Bijnor.

2. Papaver Linn.

Key to species:

Leaves amplexicaul; flowers white ............... 1. P. somniferum
Leaves not amplexicaul; flowers red or pink ........................................ 2. P. rhoas


Collected only once from a mango orchard.

Flowering & Fruiting: December-April.

Athar 96, Bijnor.


Annual, erect herb. Leaves not amplexicaul; surface hispid hairy, deeply pinnatifid. Flowers solitary, terminal, long pedicelled; bud nodding. Sepals 2, free, caducous. Petals 4-6, red or pink, with dark spot at the base. Seeds many, dark-brown.

Ornamental, much sought after by lovers of seasonal flowers.

Flowering & Fruiting: December-March.

Athar 513, Agri House, Bijnor.

3. Eschscholtzia Cham.


Annual, cultivated herb. Stem spreading, sulcate, hollow. Leaves long petioled, pinnately partite; segments linear-oblong. Flowers
solitary, yellow-orange, very delicate. Sepals 2. Petals 4, rarely 6, obovate cuneate. **Capsule** distinctly ribbed with recurved basal valves. **Seeds** many, reticulate.

**Flowering & Fruiting:** January–April.

**Ather 514, Exhibition Ground.**
VIII. FUMARIACEAE

Fumaria Linn.


*Fumaria vaillantii* Loisel var. *indica* Hassk. in Flora. 56:443, 1873.


A pale-green, much branched, bitter herb, branches ascending or diffused. Stem pentangular, fistular, glabrous. Leaves decompound; segments linear, lanceolate, acute. Racemes leaf opposite, lax. Flowers bracteate, the bracts being smaller than the pedicel. Sepals 2, small, caducous, deltoid, hyaline with slightly pinkish tinge; margins shortly fimbriate. Petals 4 (2+2), outer 2 unequal; the posterior being spurred at the base; 2 inner lighter in colour, coherent at the top, equal and keeled at the back. Stamens in two bundles, filaments membranous, hyaline and dilated at the base. Stigma capitate. Fruit globose, single seeded.

A very common weed of wheat fields, grows in association with *Anagalis arvensis, Vicia hirsuta, Stellararia media*, etc.

Flowering & Fruiting: December-March.

Athur 35, Vidur Kuti Road, Bijner.
Key to genera:

Flowers white; pod long or short.

Small herbs without fleshy root stock.

Amphibious; pod long; seeds

2-seriate ............................................. 1. Korippa

Terrestrial; pod short.

Flowers zygomorphic ......................... 2. Iberia

Flowers actinomorphic ....................... 3. Alyssum

Large herbs with fleshy roots .............. 4. Raphanus

Flowers yellow, pink or white (then the pod not short).

Stamens 6; erect herbs.

Pod unbeaked (with 2 short horns in

Matthiolas).

Pod nearly glabrous.

Flowers white; ebracteate .... 5. Arabidopsis

Flowers yellow; bracteate .... 6. Sisymbri um

Pod hairy; flowers pink or

white ............................................. 7. Matthiola

Pod beaked.

Flowers sulphur-yellow; stigma

capitate; seeds in one row .......... 8. Brassica

Flowers with purple veins; stigma

depthly two lobed; seeds in two

rows ............................................. 9. Eruc
Stamens 2, prostrate herbs ............... 10. Coromopus

1. Harippa Scop.


_Sisymbrium nasturtium-aquaticum_ Linn. Sp. Pl. 657, 1753.


Aquatic or amphibious, glabrous herb; rooting at the nodes. Leaves pinnatifid with 2-10 lobes; base cordate. Flowers white in elongated ebracteate raceme; the pedicel elongates with maturation of fruit. Pod slightly upcurved. Seeds in 2 rows (usually) orange-red.

Common on the banks of Ganga. In this species the extent of development of root system seems to be influenced by amount of water available. The plants growing in a water body develop small roots while those growing on moist sand develop a very extensive root system.

**Flowering & fruiting: December-April.**

_Athar_ 447, _Nawli Ghat_ and _Madhya Ganga Barrage._

2. _Iberis_ Linn.


Erect or ascending cultivated, ornamental plants. Lower leaves pinnate partite; upper ones sessile, dentate. Flowers white in flat topped corymbose raceme. Petals 4, 2 short and 2 large.
A very common ornamental plant, much valued for bedding purposes. Sometimes met with as an escape.

Flowering & Fruiting: December-April.

Athar 484, Vardhaman Degree College, Bijnor.

3. **Alyssum Linn.**

* Alyssum maritimum (Linn.) Lank, Encycl. 1:98, 1783.


This is also an ornamental plant and resembles much with *Iberis amara* but can be distinguished by its actinomorphic flowers.

Commonly used for bedding purposes in lawns.

Flowering & Fruiting: January-April.

Athar 485, Indra Tagg Vihar (Indra Deer Sanctuary), Bijnor.

4. **Raphanus Linn.**


Erect herbs with fleshy tap root having a pungent taste. Lower leaves long-petioled, upper short-petioled, flowers white or pale-purple.

* Pods long, erect or erecto-patent, beaked.

Commonly cultivated as vegetable, locally called as, "Mooli".

Flowering & Fruiting: January-April.

Athar 506, Jhekri Ki Chowki, Bijnor.


A very slender branched, hairy annual; lower leaves petioled, lanceolate, finely toothed; upper ones sessile. Flowers minute, white. Pods slender, erect. Seeds very small flattened.

Not very common. In lawns among the grasses.

Plants associated: *Funaria indica*, *Anagallis arvensis*, *Lolium sp.* etc.

Flowering & Fruiting: December-March.

Athar 163, Gupta Nursery, Bijnor.


Key to species:

Leaves deeply lyrate; flowers yellow ............ 1. *S. irio*  
Leaves compound; flowers yellow ................. 2. *S. sophia*


Not very common.

Plants associated: Solanum nigrum, Stellaris media, Oldenlandia corymbosa etc.

Athermal 185, Railway Station Godown.


Erect, stellately tomentose herb about 35 cm tall, lower part slightly tinged with purple. Leaves alternate, exstipulate, 2-3 pinnatisect; segments hairy, linear, racemes axillary or terminal, about 15 cm long; peduncles glabrous or with few hair. Calyx stellately hairy. Petals equal to or slightly longer than the sepals. Style very short; stigma capitate. Fruiting pedicel slender. Fruits glabrous about 2 cm long curved upwardly. Seeds in a single row.

Flowering & Fruiting: February-April.

Rare, could be collected only once from a recently established mango orchard near Kherki Village.

Athermal 206, Kherki Village.

7. Matthiola R. Br.


Cherianthus incanus Linn. Sp. Pl. 662, 1753.

*New record for upper Gangetic plain.
An annual with white or grey pubescent. Leaves subshasty, lanceolate, heart. Flowers in lax racemes, pink, purple or white. Fruits slightly compressed, many seeded. Seeds lenticular, plane all around, light-brown.

A winter annual, frequently planted in beds.

Flowering & Fruiting: January-April.

Athar 501, St. Mary’s Convent School, Bijnor.

B. Brassica Linn.

Key to species:

Stems well developed, tall and herbaceous.

Seeds brown-black .......................... 1. B. juncea
Seeds yellow ............................ 2. B. campestris var. Sarson

Stem absent or very short and hard.

Herbs without stem; root napiform ......... 3. B. rapa
Herbs with short and hard stem, root normal.

Young inflorescence forming a creamy or yellow mass .............................. 4. B. oleracea var. botrytis
Leaves orbicular and condensed to form a compact spherical head ............... 5. B. oleracea var. capitata
Stem base tuberous .......................... 6. B. oleracea var. gongylodes


 Erect branched herb, glabrous. Lower leaves oblong-lanceolate, petioled, lyrate; upper lanceolate, entire or toothed, subsessile.


*Flowering & Fruiting*: January-April.

An important oil crop of the area, sown alone or mixed with wheat.


Vegetatively resembles with *B. juncea*, but distinguishable by its long beaked pod and yellow seeds.

*Flowering & Fruiting*: January-April.

An important oil crop of the area, sown alone or mixed with wheat.


Flowering & Fruiting: April–May.

Vegetable crop, locally called as, "Shaljam" or "Shalgham".


Flowering & Fruiting: March–May.

An important vegetable crop. Locally called as, "Khool–Gobhi" (Cauliflower).


A stout herb, differs from B. oleracea var. botrytis in having a globular ball like head, composed of condensed leaves.

Flowering & Fruiting: March–May.

Vegetable crop, locally called as "Danh–Gobhi" or "Pat–Gobhi" (Cabbage).


Stem tuberous at base.

Vegetable crop, locally called as, "Santh–Gobhi".


**Brassica eruea** Linn. Sp. Pl. 667, 1753.

 Erect branched herb. Lower leaves lyrate, hairy; upper linear lanceolate, or shallowly dentate. Flowers in long racemes, yellow or cream-yellow with purple veins. Pods slightly flattened, appressed against the fruiting stalk, beaked; valves 1-nerved. Seeds reddish-brown.

Flowering & Fruiting: January-April.

Cultivated. The seeds yield oil.

Ather 187, Alarab Meeran Shah Mohammad.

10. *Coronopus* Linn.

**Coronopus didymus** (Linn.) Smith FIBI. 2:691, 1804; Hedd. 57, 1949.

**Lepidium didymum** Linn. Syst. 2:433, 1754.


Flowering & Fruiting: November-May.

Very common in waste places.

Plants associated: Malvastrum coromandelianum, Spergula fallax, Mazus rugosus, Cynodon dactylon etc.

Athar 342, Railway Station.
Key to genera:

Glandular herbs; leaves digitately compound; fruit a capsule .......................... 1. *Cleome*

Elylandular shrubs or trees; fruit a berry.

   Erect or climbing shrubs with hooked spines ........................................... 2. *Capparidaceae*

   Trees, without spines; flowers cream, appearing before the leaves ................ 3. *Crataeva*

1. *Cleome* Linn.

Key to species:

Flowers white, with a well developed gynandrophiore ..................................... 1. *C. gynandra*

Flowers yellow; no gynandrophiore.

   Small herbs, with upper leaves simple; seeds smooth .................................. 2. *C. brachycarpa*

   Large herbs; all the leaves dissected; seeds granular ................................. 3. *C. virosa*


*Cleome pentaphylla* Linn. Sp. Pl. 938, 1763.


Genera 17:382, 1914.


A common waste-land or road-side herb during rainy season.

Plants associated: Tridax procumbens, Eclipta prostrata, Cynoglossum sp. and Cyperus rotundus.

Flowering & Fruiting: July-November.

Ather 136, Gazi Para, Bijnor.

2. Cleome brachycarpa Vahl ex DC. Prod. 1:240, 1824; FBI. 1:169;


According to Jacquemont this plant is found only between Agra and Delhi. I am also of the opinion that this taxon is not indigenous to Bijnor, as it could be collected only once from near the Railway track at Chandpur.
Flowering & Fruiting: Rainy season.
Ather 176, Chandpur.

3. Cleome viscosa Linn. Sp. PI. 672, 1753; FBL. 1:170; Flbr. 1:50;
    Cleome jacobsiana Linn. Sp. PI. 672, 1753.

An erect annual mostly unbranched, glandular. Leaves 3-5 foliate;
leaflets, elliptic-ovate to oblong, acute or obtuse, cuneate.
Flowers yellow, pedicelled in terminal corymbose racemes. Sepals 4,
free, shorter than the petals. Petals 4, yellow. Stamens many.
Gynoecium bicarpellary, ovary 1-celled. Style 1, stigma capitate.
Capsule long, shortly beaked. Seeds dark brown, reniform.
A very common rainy season herb on road-sides, in waste-lands,
gardens etc.

Plants associated: Oldenlandia corymbosa, Amaranthus sp.,
Achyranthes aspera etc.
Ather 128, Vardhman P.J. College, Bijnor.

2. Capparis Linn.

Key to species:
A climber with ferruginous tomentum on buds
and young shoots; flowers pinkish ............... 1. C. sepiaria
A shrub without ferruginous tomentum and
with white flowers .................................. 2. C. sepiaria

**Capparis harrica** Linn. *f. Suppl.* Pl. 264, 1781; FBI. 1:178; FUGR. 1:52; FFGC, 24.


A common climber of summer season climbs on a variety of plants. Flowering & Fruiting: March–October.

Author 270, Vidur Kuti Road.


A medium sized shrub, without rusty tomentum. Internodes shorter. Flowers in axillary, subumbellate raceme, white. Sepals 4, free. Petals 4, free, unequal, sparsely or densely hairy in lower half. Stamens numerous; filaments white. Fruit a globose berry, deep violet when ripe.

Not uncommon, flowers in summer.

Plants associated: *Azylthus oenoplia*, *Clerodendrum phlomoides*. It sometimes supports other climbers like *Abrus precatorius* and *Coccinia grandis*. 
Flowering & Fruiting: May-August.

Athar 338, Ganj Road.

3. Crataeva Linn.


Crataeva religiosa auct (non Forst).

Crataeva religiosa Forst. f. Prod. 35, 1786; Royle Ill. 72; FBI. 1:172; FUCH. 1:50. reap. ed 1960.


Generally planted in gardens or on road-sides.

Flowering & Fruiting: April-August.

Athar 248, Jain Farms.
XI- VIOLACEAE

Key to genera:

Leaves linear-lanceolate; stipules subulate, gland tipped; flowers red ............ 1. Hybanthus
Leaves ovate-oblanceolate; stipules large, foliaceous, lyrate; flowers differently
coloured, not red ........................................ 2. Viola


Hybanthus enneaspermus (Linn.) P. Mill. Fragm. 10:81, 1877.


Ionidium enneaspermum (Linn.) Jord. Jord., Holm. Sub. t. 22, 1893;

An erect or diffuse herb; base woody. Leaves linear-lanceolate,
shortly petiolate. Flowers red, solitary axillary; one petal longer
than the others. Stamens 5. Ovules many on three parietal placentae.
Occasionally found in sandy soil.

Plants associated: Evolvulus alisincoides, Indigofera linnaei,
Centipeda minima etc.

Flowering & Fruiting: October-December.

Ahar 459, Mandawar, from the sun facing slope of a large mound.

2. Viola Linn.

Viola tricolor Linn. Sp. Pl. 935, 1753.
Erect annual herb. Stem branched, glabrous and angular. Leaves ovate-oblance, crenate, stipules large and foliaceous. Flowers solitary axillary, pedicel long, zygomorphic. Sepals 5, free, appendiculate. Petals 5, spreading, violet coloured with streaks of different colours (dominance of violet colour is not necessary, the dominant pigment varies from variety to variety), anterior spurred or saccate at base. Stamens 5, forming a ring around the ovary; filaments very short. Gynoecium 3-carpellary, syncarpous, 1-celled; many ovules on 3-parietal placentae. Stigma swollen. Fruit capsule.

Common winter annual.

Flowering & Fruiting: Winter season.

Ather 222, Municipal Park, Bijnor.
XII. FLACOURTIACEAE

Flacourtia L'Herit.

Flacourtia indica (Burm. f.) Merr. Interp. Herb. Amb. 377, 1917;


A deciduous polymorphous shrub or tree. Stem armed with spines; bark light grey exfoliating in thin flakes. Leaves variable in size, shape and texture; usually broadly ovate, crenate serrate, glabrous above, pubescent beneath. Flowers in short, few flowered axillary or terminal racemes; unisexual. Stems numerous; filaments free. Ovary with parietal placentation. Styles 4-8. Fruit globose-ellipsoid, deep scarlet red, 5-9 seeded.

Flowering & Fruiting: April-July.

Common along road-side ditches.

Ather 238, Vidur Kuti road.
XIII- POLYGALACEAE

Polygala Linn.


Medium sized, annual herbs, branched or unbranched. Stem with short hair. Leaves quite variable in shape and size, from oblong, obovate to lanceolate, acute, mucronate. Racemes short, lateral or leaf opposed. Flowers shortly pedicelled; bracteate. Sepals 5, free, 2 inner falcate-ovate-elliptic; outer ovate, sharply acuminate. Petals 2, upper adnate to staminal tube; keel with a bearded crest. Capsule orbicular-oblance, notched and oblique at apex. Seeds black, with three lobed caruncle.

Not common, found in grassy localities.

Plants associated: Indigofera linnæi, Spargula fallax, Desmodium triflorum, Convolvulus microphyllus etc.

Flowering & Fruiting: July-November.

Athar 14, Mandawar.
XIV- CARYOPHYLLACEA

Key to genera:

Plants grown for ornamental purposes.

Limbo of the petals fimbriate; calyx
fused to form a tube .................... 1. Lianthus

Limbo of petals not fimbriate; calyx
divided up to base ....................... 2. Gypsophylla

Plants growing wild.

Flowers pink.

Calyx angular; plant extensively
dichotomously branched ................ 3. Vaccaria

Calyx not angular, inflate in
fruit, many nerved; plant simple
or sparsely branched ................... 4. Silene

Flowers white (in Polycarpaceae first
pink then silvery white).

Leaves linear.

Seeds winged ......................... 5. Spergularia

Seeds not winged ....................... 6. Polycarpaceae

Leaves broad.

Plants prostrate or ascending;
flowers subsessile; root stout ... 7. Polycarpon

Plants ascending; flowers
distinctly pedicelled; root
slender.
Petals divided upto base
(seemingly 10) ............... 8. Stellaria
Petals undivided (5) ......... 9. Arenaria

1. Dianthus Linn.


An erect glabrous herb. *Leaves* sessile, entire, acute. *Flowers* of
different colours, ranging from white to dark red and with a dark
coloured centre. *Epicalyx* present. *Petals* free, limb dentate-

A very popular annual of spring season. Planted in pots and beds,
sometimes found as an escape.

Flowering & Fruiting: January-April.

Ather 492, Indra Nag Vihar, Bijnor.

2. *Gypsophila* Linn.


An upright annual. Stem extensively dichotomously branched, glabrous.
*Leaves* subsessile, lanceolate, entire, acute. *Flowers* on long fili-
form pedicels, white. *Calyx* divided down nearly to base; *sepals* acute,
margins scarious. *Petals* much longer than the *sepals*, emerginate.

Winter annual, planted in rockeries, beds and pots. Also found as an
escape.

Flowering & Fruiting: January-April.

Ather 491, S.B. Sugar Mills.


Often found in wheat fields in winter season.

Plants associated: *Vicia hirsuta, Anagallis arvensis, Heliotropium marifolium, Asphodelus tenuifolius* etc.

Flowering & Fruiting: January-April.

Athar 262, Cajraula.


Erect dichotomously branched, gland pubescent annual. Flowers solitary axillary. Calyx almost tubular in young flowers but becomes inflated as the flower grows old and is quite inflated in fruit; teeth 1/3rd the length of tube. Petals small, claw auricled at the junction with limb. Capsule sessile, ovoid, with a long beak and there are three
prominent depressions around the base of beak, crustaceous, shining.

Seeds coelolate.

Fairly common in cultivated fields, grass lands etc.

Plants associated: *Anagallis arvensis*, *Heliotropium marifolium*,

*Oldenlandia corymbosa*, *Ageratum conyzoides*, *Lolium temulentum* etc.

Flowering & Fruiting: December-April.

A nthar 53, Village Paidi.


*Spergula fallax* (Love) Krause in Sturm. Fl. Deutsch. (ed. 2). 2:119,

1901; Milne-Redhead in Kew. Bull. 1950:333, 1950; Burt, and Lewis in


*Arenaria flaccida* (L.) Fl. Ind. 3:447, 1832 (non Clairv. 1811).

*Spergula pentandra* Linn. var. *intermedia* Boiss. Lign. ser. 2. 1:93,

1853 et Fl. Orient. 1:731, 1867.


1889.

*Spergula pentandra* Sensu Edgew. & Kt. f. in Fl. Brit. Ind. 1:243,

1874; *pro parte* (non Linn. 1753); Linn. 1:67, repr. ed. 1960.

A glabrous green herb, quite variable in size depending on the

habitat. Leaves linear, stipulate. Flowers white in lax terminal

dichasial cymes, pedicelled. Sepals ovate, scarious margined and

Plants associated: Stellaris media, Camellina benghalensis, Tridax procumbens, Lepista prostrata, Anterhinum orientium, Opiumenus sp. etc.

Flowering & Fruiting: December-April.

A harsh 55, Satiyana, abundant throughout the area.


Achyranthes corymbosa Linn. Sp. fl. 203, 1753.


Plants associated: Vicia sp., Leucaea aspera, Trichodesma zeylanica, Arnebia bispidissima, Brachystis sp., Perotis indica etc.

Flowering & Fruiting: August-November.

Found in sandy soil.

Ahar 166, Jalalpur and Khorki.

7. Polycarpon Loeff. ex Linn.


Looefingia indica Retz. Observ. 4:8, 1786.


Plants associated: Indigofera sp., Eclipta prostrata, Sonchus arvensis, Rangia pectinata, Phyle nodiflora, Camphora celsicoides, Polygonum plebeium, Setaria glauca etc.

Flowering & Fruiting: February–June.

Ather 265, Mandawar and Gajraula. Found in shady moist as well as dry situations.

8. Stellaria Linn.


**Alaine media** Linn. Sp. Pl. 272, 1753.


Plants associated: *Oxypetalum fellax, Justicia simplici, Repeta hindostana, Chenopodium album, Prunula umbellata, Berus amannicidae* etc.

Flowering & Fruiting: November-March.

**Athar 61, I.T.P. Inter College, Agriculture Farm.** Abundant in cultivated as well as waste lands. In shady and moist situations it forms a dense vegetation.

9. **Arenaria** Linn.


This plant differs from *Stellaria media* in being smaller, darker in colour, glandular hairy and having entire petals.

Flowering & Fruiting: January-April.

**Athar 215, Vidur Kuti Road, bare, found on raised margins of the fields.**
XV. PORTULACACEAE

Portulaca Linn.

Key to species:

Nodes hairy,

- Petals 5-6; stamens 10-30; seeds globose ............................. 1. P. pilosa
- Petals 4; stamens 7-10; seeds reniform ............................. 2. P. quadrifida

Nodes not hairy; leaves spatulate;

- Petals yellow ......................................................... 3. P. oleracea


Flowering & fruiting: April-October.

Common among the grasses in shady and moist localities.

Athar 5, Vardhaman P.O. College play ground.


A slender, extensively branched annual herb, rooting at the nodes.

Flowering & fruiting: August-November.

Commonly found, particularly in manured soil of the lawns.

Athar 109, Bijnor.


Flowering & fruiting: March-November.

Abundant on road sides and old building walls.

Athar 137, Bijnor.

Portulaca grandiflora Hook. is a commonly cultivated ornamental herb.
Tamarix Linn.


Flowering & Fruiting: June-October.

Common on the dry banks of Ganga.

Athar 223, Near Madhya Ganga Barrage.
Bergia Linn.

*Bergia annahoides* Heyne ex Roth Nov. Pl. Sp. 219, 1821; Romb.


Erect or ascending marshy herb, glandular pubescent. Leaves simple, stipulate, elliptic-oblong or obovate-oblong, gland ciliate. Flowers crowded in dense axillary fascicles, 3-merous. Sepals 5 (-3), free, ovate-oblong, keeled, scarious along the margins, ciliate. Petals as many as the sepals, rose coloured, equal to or shorter than the sepals. Stamens equal to sepals in number. Ovary 5-carpellary, grooved, reddish in colour; valves separating from the axis. Seeds many dark brown, reticulate.

Flowering & Fruitting: October-May.

Abundant in moist localities.

Ather 73, Near Khari.
XVIII- DIPTEROCARPACEAE

Shorea Rehb.


Flowering & Fruiting: March-July.

Occasionally found near villages.

Athar 340, Latiyana.
XIX. MALVACEAE

Key to genera:

Leaves rounded in outline
(not palmatifid).

Trees with oblong-spathulate
bracteoles and white flowers .......... 1. *Kydia*

Herbs.

A prostrate-ascending herb; leaves
long petioled; flowers small,
sehile, axillary; corolla hardly
exceeding the calyx; lilac; fruit
not spinous ............................ 2. *Halva*

Erect herbs; corolla pink-red,
exceeding the calyx; fruit with
hooked bristles .......................... 3. *Urena*

Leaves otherwise.

Leaves palmately divided.

Seeds covered with long silky
hairs ...................................... 4. *Gossypium*

Seeds not as above.

Calyx spatulate, caduceous;
staminal tube antheriferous
throughout ............................. 5. *Abelmoschus*

Calyx campanulate or cupular,
persistent; only upper half
of staminal tube antheriferous ... 6. *Hibiscus*
Leaves not divided.

Fruit strongly ribbed .................... 7. Abutilon
Fruit not ribbed,

Bracteoles none ......................... 8. Side
Bracteoles 3 ........................... 9. Malvastrum

1. Kydia Roxb.


A medium sized tree with grey bark. Herbaceous parts with stellately hair. Leaves rounded, 5-7 nerved, cordate, brownish black above (when dry) and pale beneath, long petioled. Flowers polygamous, white, in axillary and terminal dense panicles. Bracteoles oblong-spathulate, 4-6 accrescent. Calyx lobes 5, accrescent, rusty tomentose. Petals exceeding the calyx tube. Capsule 3-valved. Seeds reniform, oblique, striate.

Flowering & Fruiting: July–December.

Sometimes planted as avenue tree.

Ather 372, Dharam Nagri.

2. Malva Linn.


Decumbent, spreading, annual herb. Leaves broadly ovate-elliptical,
cordate, crenate, dentate, long petioled. Flowers in sessile
axillary clusters; bracteoles 3, linear. Sepals 5, forming a tube,
persistent. Petals 5, slightly connate at base, amarginate, white,
hardly exceeding the calyx. Carpels 8-12; ovary 8-12 celled with
1-ovule in each cell. Styles as many as the carpels. Seeds sub-
reniform, dark-brown.

Flowering & Fruiting: January-April.

Abundant in road-side ditches, it prefers moist and shady locali-
ties.

Ather 502, Dakhshi-Jala.

3. Urena Linn.

Urena lobata Linn. Sp. Pl. 692, 1753; FDI. 1:329, 1874; FUCP. 1:80,

An erect stellate tomentose herb or under shrub. Leaves ovate-
orbicular; lower angular lobed; upper lobed or entire; nerves 6-8.
Flowers rosy-pink in axillary clusters; bracteoles 5, adnate to
calyx. Sepals 5, connate. Petals free, basally connate, much
exceeding the calyx. Fruit separating from axis into 5-mericarps,
covered with light brown, hooked bristles. Seeds reniform with a
conspicuous scar, dark brown.

Flowering & Fruiting: July-January.

Very common in waste-lands, road-sides and among hedges.

Ather 192, Near Lid Uah.

Key to species:

Flowers red-purple ....................................... 1. *G. arboresum*
Flowers pale-yellow ....................................... 2. *G. hirsutum*

A perennial erect shrub, nearly all parts hirsute with stellate hairs. Leaves palmatifid, lobes 3-5, ovate, oblong, acuminate. Flowers large, red purple; bracteoles 3, connate. Fruit a 3-valved, beaked capsule.

Flowering & Fruiting: August-October.

Often found in gardens, sometimes as an escape.

Athar 590, Bukhara.


Erect, much branched, shrubby herb. Hairs confined to petioles, nerves and pedicels etc., otherwise glabrous. Leaves palmatifid, lobes 3-5, black punctate. Flowers yellow, bracteoles 3, free, pectinate. Fruit 4-5 valved capsule, beaked, glandular pitted.

Flowering & Fruiting: August-November.
Occasionally cultivated in fields.
Ather 570, Ganj Read.

5. Abelmoschus Medik.

Key to species:
Fruits elongated fusiform ..................... 1. A. esculentus
Fruits ovoid to oblong .......................... 2. A. moschatus

1. Abelmoschus esculentus (Linn.) Böehn ex Meth. Pl. 617, 1794;

Hibiscus esculentus Linn. Sp. Pl. 696, 1753; FBL. 1:343, 1874;

Erect hirsute herb. Stem woody at base. Leaves 3-5 lobed with oblong-
lanceolate lobes, coarsely dentate-serrate. Flowers solitary
axillary, yellow with crimson centre. Fruit long, fusiform. Capsule
loculicidal, ribbed. Seeds black, ovoid-reniform.

Flowering & Fruiting: June-November.

An important vegetable crop and extensively cultivated for the sake
of fruits locally called, "Shindi".

Ather 535, Ganj Read.

2. Abelmoschus moschatus Medik. Malv. 46, 1787; Blumea 14:90, 1966;
HFLD. 82, 1977.

Hibiscus abelmoschus Linn. Sp. Pl. 696, 1753; FBL. 1:342, 1874;

An erect hirsute herb. Leaves broadly ovate-orbicular, 5-angled.
Flowers solitary axillary or in short terminal racemes, nodding, yellow with crimson centre; bracteoles 7–10, linear, Sepals 5, densely pilose. Stamen tube antheriferous almost throughout its length. Fruit ovoid-oblanceolate, loculicidal capsule, hispid. Seeds subglobose, reniform with a scar.

Flowering & Fruiting: October–January.

Rare, occasionally found growing among road side thickets.

Ather 341, Hemrajpur.

6. Hibiscus Linn. nom., cons. prop.

Key to species:

Epicalyx minute; flowers pure white or cream .......................... 1. H. lobatus

Epicalyx well developed; flowers yellow with crimson centre.

Epicalyx 5–6, free from the calyx;
each sepal without gland at the back ..... 2. H. vitifolius

Epicalyx 7–10, adnate to calyx near the base; each sepal with a gland at the back .................. 3. H. cannabinus


An erect, simple or sparsely branched annual, glandular hairy, the glands red. **Leaves** lower simple, upper palmately lobed; margins serrate, both the surfaces hispid hairy; petiole longer than the blade. **Flowers** solitary axillary. **Calyx** 5-lobed; lobes divided half-way down; sepals keeled, gland hairy, upper 1/3 part hairy inside. **Petals** cream yellow. **Fruits** loculicidal capsule. **Seeds** black, glabrous.

**Flowering & Fruiting:** August-November.

Common, in waste places, among under-growth in orchards etc.

Atha 161, Bid Cah.

This species of *Hibiscus* can be readily identified, when freshly pressed, since the fresh specimen sticks to the paper due to the glandular hairs.


An erect under-shrub. Stem faintly striate and slightly hairy. **Leaves** ovate-cordate, 3-5 lobed; lobes acute, coarsely serrate. **Flowers** solitary, axillary or in terminal nodding racemes; bracteoles 5-6, filiform. **Calyx** sepals 5, connate into cupular calyx tube, hairy outside. **Petals** 5, free, basally connate, bright yellow, with purple base. **Fruit** a loculicidal capsule, subulate-acuminate,
5-lobed, hairy. **Seeds** ovoid, reniform, scar distinct, finely tuberculate, dark brown.

**Flowering & Fruiting:** September–December.

Often found in fields.

Atheyar 374, Husainpur.


Annual under-shrub. **STEM** erect, spiny. **Leaves** 3–5 lobed, glandular at base. **Flowers** solitary axillary, pale yellow; centre purple; bracteoles 7–10. **Calyx** each sepal with a gland at back. **Fruit** a globose, bristly capsule, prominently beaked. **Seeds** ovoid-reniform, dark-brown.

**Flowering & Fruiting:** August–November.

Cultivated for the sake of fibres extracted from its stem.

Atheyar 376, Kherki.

Other species of **Hibiscus** of ornamental value and grown in the area are:

1. **Hibiscus rosa-sinensis** Linn. Large shrub, old stem lenticular, leaves ovate, dentate, shining above, stipules linear. **Flowers** axillary. **Calyx** forming a tube. **Petal** 5, red, recurved. **Staminal tube** long, equalling or longer than the corolla; antheriferous in upper part only. **Style** 1, encircled by staminal tube; stigma 3–6, capitate, velvety-red.
2. *Hibiscus mutabilis* Linn. A large shrub with orbicular palmately lobed leaves; flowers white turning to pink; in terminal clusters.

3. *Hibiscus subdariffs* Linn. Cultivated for its fleshy, acid sepals. Another ornamental plant often mistaken for *Hibiscus* is *Calvaviscus contratili* Greenm. This plant can be readily recognised by its red corolla which is nearly closed save a small opening at the top through which staminal tube protrudes. I have seen this plant growing near Police Club, Bijnor.

7. *Abutilon Mill.*


*Sida Indica* Linn. Cont. Fl. 2:26, 1756.


Flowering & Fruiting: Winter season.

Abundant on road sides and in waste places.

Athan 332, Exhibition Ground.

8. *Sida Linn.*
Key to species:

Weak herbs with long trailing stems;
peduncle jointed at or above the middle ...... 1. S. cordata
Erect, shrubby herbs; peduncle jointed near top.

Beaks of ripe carpels equalling the
calyx ........................................... 2. S. spinosa
Beaks of the ripe carpels exceeding
the calyx ......................................... 3. S. cordifolia


Sida humilis Cav. Diss. 5:227. t. 136. f. 2, 1788; FDI. 1:322, 1874.

Trailing weak herb sometimes suffused with black. Leaves ovate-cordate; margins crenate. Flowers solitary-axillary, orange-yellow.

Flowering & Fruiting: Rainy and winter season.

Abundant in waste places, among hedges and sometimes grows on walls.

Ather 145, Near Eid Gah.


*Flowering & Fruiting*: September–December.

*Often found on road sides.*

*Athar 155, Siyu.*


*Flowering & Fruiting*: August–December.

*Often found in Mango orchards.*

*Athar 272, Jhalu Road.*


Erect branching herb, hairs attached in the middle and sometimes one or usually both the ends bifurcated. Leaves petiolate, with very fine scattered hair adaxially and on abaxial face hairs only on veins and resemble those of stem morphologically; margins toothed; main lateral nerves 5-7 pairs. Flowers yellow, solitary axillary; bracteoles 3. Calyx sepals 5, connate. Petals longer than the sepals, orange-yellow. Ripe carpels dark brown in colour, hairy, armed. Seeds reniform.

Flowering & Fruiting: Practically throughout the year.

Abundant in nearly all types of terrestrial situations.

*Athan* 393, Bukhara.
XX. BOMBACACEAE

Bombax Linn.


Salmalia malabarica (DC.) Schott. & Endl. Holot. 33, 1832.

A large deciduous tree with straight trunk and whorled branches; trunk base buttressed, Dark ashy grey; stem with conical prickles. Leaves palmate, leaflets 5-7, lanceolate, obovate, entire, subcoriaceous, common petiole equal to or longer than the leaflets. Flowers appear before leaf emergence, red. Calyx fleshy, silky and lustrous inside. Petals larger than the sepals, oblong-obovate, recurved, stellate pubescent externally. Stems numerous, divided into 2-groups, the outer ones in 5 fascicles; the inner ones basally connate, 5 of them forked at the top and each branch bearing an anther (2-3 celled) remaining anthers 1-celled; anthers long and twisted later. Capsule oblong, ovoid, slightly angular, woody. Seeds glabrous, embedded in white cottony mass.

Flowering & Fruiting: February–June.

Common in the area.

Athur 534, Bijnor.
Key to genera:

Herbs.

Leaves ovate-lanceolate; flowers pink or white, in compact terminal heads;

staminodes none ........................................ 1. Helochia

Leaves linear-lanceolate; flowers red, axillary; staminodes 5, petaloid ........ 2. Pentapetes

Shrubs or Trees.

Lower surface of the leaves not ashy brown; flowers red; fruit twisted, a
shrub ......................................................... 3. Helicteres

Lower surface of the leaves ashy brown; flowers white, fragrant; fruit
woody, not twisted, a tree ......................... 4. Iterospernum

1. Helochia Linn.


Mecolea truncata J.C. & A. I.C.

Erect, unbranched or branched annual. stem glabrous, except two hairy lines along internodes. Leaves ovate-lanceolate, cordate or rounded, serrate-incised. Flowers in subsessile, compact, terminal many flowered heads. Corolla, nearly twice the length of calyx. Petals
pink or white. **Stamens** 5; **staminodes** none; **filaments** connate basally.

**Capsule** globose, hispid.

Plants associated: *Crotalaria prostrata*, *Corchorus sestuans*, *Ureca lebata*, *Croton bonplandianum*, *Nicotiana plumbaginifolia* etc.

Flowering & Fruiting: July-November.

A very common plant, capable of growing in a variety of soils. vegetatively it can be mistaken for *Salviastrum coronandelianum* but can be easily discerned with the help of two hairy lines running along the internodes which are absent in *S. coronandelianum*.

Athan 160, Bega Sala.

2. **Pentapetes**


An erect shrubby annual, stellate pubescent. **Leaves** long, linear lanceolate, serrate, stellate hairy beneath, petiolate; stipules linear, subulate. **Flowers** axillary, scarlet, solitary or paired. **Staminodes** 5, petaloid. **Capsule** globose, hairy.

Flowering & Fruiting: Rainy season.

Cultivated, often found in parks and gardens.

Athan 22, Nehru Sports Stadium.

3. **Helicteres** Linn.

Erect shrub, young parts stellately tomentose. Leaves distichous, oblong suborbicular to obovate, acute, crenate serrate to lobed, sebaceous adaxially and pubescent abaxially; stipules deciduous. Flowers zygomorphic, red, solitary or 2-4 clustered. Calyx 2-lipped, gibbous, hairy. Petals 5, clawed, reflexed, unequal. Stamens forming a column; staminodes 5, scale-like. Fruit cylindrical, twisted.

Flowering & Fruiting: April-December.

Rare. Sometimes found in Khadar area.

Athan 269, Jalalpur.

5. Pterospermum Schreb.


Flowering & Fruiting: January-July.

Cultivated. Planted in gardens, parks and Inspection houses.

Athan 282, Telephone Exchange.
Key to species:

Fruit spinous; flowers in leaf opposed
or axillary panicles ................................. 1. Tiliopsis
Fruits not spinous; flowers in axillary clusters.

Fruits dry .............................................. 2. Corchorus
Fruits fleshy ............................................ 3. Grewia

1. Tiliopsis Linn.


Tiliopsis bartrami Linn. Syst. (ed. 10). 1944, 1759 (non. illeg.).

A branched or unbranched herb, stellately pubescent. Leaves petio- late, petiole somewhat swollen near the leaf base; leaf polymorphous, pubescent on both the faces, 2-7 nerved, coarsely, serrate, apex acute. Sepals oblong, the apical extension of the sepal is somewhat spur-like structure. Flower globose and tubercled. Fruit spinous.

Flowering & fruiting: Rainy season.
Abundant within the area.

Ather 12, Bijnor.

2. Corchorus Linn.

Key to species:

Fruit subglobose ................................. 1. C. capsularis
Fruit elongated.

Beak erect entire; capsule not winged .... 2. C. olitorius

Beak spreading; capsule winged ............. 3. C. aestuans

1. Corchorus capsularis Linn. Sp. Pl. 529, 1753; exL. 1:397, 1775;

A large herb or undershrub. Stem sparingly branched. Leaves ovate, oblong-lanceolate, serrate; base sometimes with 2-sauricles, acuminate. Flowers mostly solitary sometimes fascicled. Calyx sepals 5, 1 cuculate, mucronate. Petals 5, yellow, longer than the sepals.

Stamens many, shorter than the petals. Fruit a globoso, warty capsule, 5-valved. Seeds dark-brown to black.

Flowering & Fruiting: October-December.

Often found in the localities near Ganga.

Athar 370, Homrajpur.

2. Corchorus olitorius Linn. Sp. Pl. 51, 1753; exL. 1:397, 1775;

A large branched herb. Leaves ovate-lanceolate, serrate, rounded at the base with 2-setaceous, long appendages on either sides of the base. Flowers in 1-3 flowered axillary cymes. Sepals 5, cuculate apically. Petals 5, free, oblong, yellow. Stamens many, shorter than the petals. Fruit a cylindrical, wingless, 5-valved capsule, 10-ribbed; valves transversely septate.

Flowering & Fruiting: September-December.

Common in sandy soil.

Athar 146, Kherki.


An erect annual herb, woody at base; younger parts pubescent. Leaves ovate-oblong, acute, serrate, rounded at the base; stipules linear, subulate. Flowers 2-3 in axillary fascicles. Sepals 5, free, margins reddish brown, cucullate at the apex. Petals longer than the sepals, yellow. Fruit 3-valved, cylindric capsule; valves winged, terminal beaks spreading, bifid.

Flowering & Fruiting: August-December.

This is the commonest species of *Corchorus* of this area, found on road-sides, cultivated lands, waste-lands etc.

Athar 151, Bijnor.

3. *Crowia* Linn.

Key to species:

Leaves broadly ovate; blade of petals oblong and longer than the claw.

Fruits with a crustaceous rind ............ 1. *C. sclerophylla*

Fruits without crustaceous rind ............ 2. *C. asiatica*

Leaves oblong lanceolate; blade of petals shorter than the claw, triangular ............ 3. *C. laevigata*


A dwarf shrub, young parts densely tomentose. Leaves ovate or obovate, serrate, acute–obtuse; base truncate or rounded, heavy abaxially, adaxial surface with very short stellate hairs and often reddish. Flowers in axillary, umbellate, peduncled clusters; peduncles exceeding the petiole. Sepals longer than the petals, single nerved, cuculate at apex. Petals blade longer than the claw, claw with a peripheral ring of silvery hairs. Stamens numerous.

Ovary densely hairy.

Flowering & Fruiting: April–March.

Often found on the slopes of road-side ditches.

Athal 486, Hemrajpur Road.


A medium sized tree. Bark greenish white. Leaves ovate–orbicular, serrate, 5–7 nerved, petiolated; stipules linear. Flowers in axillary peduncled clusters of 2–4 or more, peduncle longer than the petiole. Petals 5; blade equal to or longer than the claw. Fruit fleshy, pulp acid or sweet, edible.

Flowering & Fruiting: April–August.

Cultivated in orchards for edible fruits.

Athal 245, Bijner.

*L. disperma* Rottl., ex *Sprang.* *Syst.* 2, 579.


Flowering & *Fruiting*: June-January.

Often found near the villages.

*Athar* 430, Chakarpuri.
XXIII- LINACEAE

Linum Linn.

Key to species:

Flowers red; sepals shorter than the capsule; stigmas capitate ................... 1. L. grandiflorum

Flowers blue; sepals longer than the capsule; stigmas clavate ................... 2. L. usitatissimum


Erect annual herb. Stem corymbosely branched above. Leaves ovate-lanceolate, acute. Flowers red with dark centre, in leafy corymb.


Flowering & Fruiting: January-April.

Cultivated in lawns and gardens. Presents a very picturesque sight when in full bloom.

Athar 69, Engineers' Hostel.


Annual erect herb, branched or unbranched. Leaves linear-lanceolate, 3-nerved, glabrous. Flowers blue in corymbose panicles. Sepals 5.

Petals 5, blue, dentate-crenate. Stamens 5, filaments connate at
base; staminodes 5, tooth like, alternating with perfect stamens.

Styles 5, stigmas elevare. Seeds compressed, ovate, shortly beaked, polished, dark-brown.

Flowering & Fruiting: February–April.

Cultivated as a commercial crop. The seeds yield an oil, locally called as "Alsi Ka Tel".

Athat 472, Jhalu.
Tribulus Linn.


Flowering & Fruiting: June-November.

Abundant on road-sides and waste places. Prefers sandy soil.

Athin 105, Ganj Road.
XXV. OXALIDACEAE

Key to genera:

Small herbes with capsular fruits.

Plants with creeping stem or under-ground root stock; leaves digitate ....... 1. Oxalis
Plants erect, without under-ground root stock; leaves pinnate .................. 2. Biophytum

Medium sized tree; fruits juicy and with five sharp ridges ....................... 3. Averrheoa

1. Oxalis Linn.

Key to species:

Plants without root stock; flowers yellow .... 1. O. corniculata
Plants with bulbous root stock; flowers pink .............................................. 2. O. corymbosa


Plants associated: Malvastrum coromandelianum, Evolvulus alcicinsides, Indigofera sp., Cynodon dactylon, Medicago denticulata, Melilotus indicus.
A common weed growing in a variety of soils and situations.

Flowering & Fruiting: November-Late April.

Athar 313, Kambaur.


Differs from previously described species in having a bulbous root stock with few scales; comparatively larger leaflets; pink-purple flowers and petals with darker streaks.

Plants associated: Mazus punicus, Soliva anthemifolia, Veronica anagalis and Cyporus sp.

Rare. Always grows in moist situations.

Flowering & Fruiting: January-April.

Athar 311, Near the tank of Vardhman P.G. College Botany Garden.

2. Bisphytum DC.


Oxalis sensitive Linn. Sp. Pl. 434, 1753.
Erect, unbranched, annual, without any root stock. Leaves pinnate, confined to upper part of the plant, leaflets 6-12 pairs. Flowers yellow, pedicelled. Capsule short.

Plants associated: Sida cordata, Acalypha sp., Rungia pectinata, Opismenus humannii and Pousolzia zeylanica.

Flowering & Fruiting: October-January.

Rare, grows among the undergrowth in uncared mango orchards.

Ather 433, Tajpur.

3. Averrhoa Linn.


Flowering & Fruiting: March-July.

Cultivated for the sake of fruits, which are eaten raw as well as pickled.

Ather 93, Shambhu Dayal K. Sajh, Bijnor.
XXVI- TROPAEOLACEAE

**Tropaeolum Linn.**


A decumbent or straggling annual, glabrous. Leaves peltate, orbicular, long petiolated. Flowers solitary, axillary, long pedicelled; red, orange or lemon yellow, variously blotched; zygomorphic, with a long spur. Sepals 5, posterior one produced into a spur. Petals 5, distinctly clawed, 2-posterior smaller, 3-anterior larger. Stamens 0, unequal; filaments hairy at base. Ovary 3-celled, 3-lobed, minutely ribbed; style shortly 3-branched. Fruit 3-seeded.

Flowering & Fruiting: January-April.

Cultivated in parks and lawns.

Athar 33, Ejaz Ali Hall, Bijnor.
**Impatiens Linn.**


Flowering & Fruiting: Rainy season.

Cultivated in gardens.

Ather 110, Bijnor Inter College, Bijnor.
XXVIII- Rutaceae

Key to genera:

Pericarp woody.

Leaflets 3; ovary 10-20 celled .................. 1. Aegle
Leaflets 5-7; ovary 5-6 celled .................. 2. Feronia

Pericarp not woody.

 Armed shrubs or trees; leaflet 1;
 fruit a hesperidium ......................... 3. Citrus

 Unarmed shrubs; leaflets 5-20;
 fruit a berry .......................... 4. Murraya


Crataeva marmelos Linn. Sp. Pl. 444, 1753.

An armed, medium sized, deciduous tree with grey bark. Spines sharp, straight. Leaves 3- or rarely 5-foliolate; leaflets ovate-lanceolate, shallowly crenate-dentate. Flowers in axillary or terminal panicles. Sepals 4-5, small, hairy. Petals greenish-white, elliptic-oblong, gland dotted. Stamens 40-60 around a small disc, sometimes in 2-3 groups; anthers linear. Ovary 10-20 celled, ovules many in each cell; style short; stigma capitate. Fruit globose, rind woody, greenish grey or ashy grey. Seeds many, embedded in orange-coloured pulp, testa mucilaginous and hairy.
Flowering & Fruiting: April–June.

Wild form of this plant, abundant in nearby forest tracts of Najibabad, bears smaller fruits with a thicker rind. The improved variety (Kaghzi-Sel) has larger fruits, thinner and whitish rind. This form is often planted in gardens.

Athar 539, Dakhshi Gala.

2. *Feronia Correa*


A medium sized, armed tree. **Branches** pendulant. **Bark** ashy grey. **Leaf-late** 5–7, subsessile, cuneate, apex usually emarginate, subcoriaceous, rachis slightly winged. **Flowers** in pubescent panicles, shorter than the leaves; male and female flowers usually on the same panicle. **Sepals** 5–6. **Petals** 5–6, free, pale-green, tinged with dull-red. **Stamens** 10–12; filaments short and villous; anthers linear-oblung, brown. **Ovary** 5–6 celled, ovules many on 5–6 parietal placentae (the ovary becomes 1-celled when mature); style none, stigma fusiform. **Fruit** globose berry with woody pericarp, rough. **Seeds** oblong, embedded in edible pulp.

Flowering & Fruiting: April–March.
Feronia limonia (Linn.,) Swingle

A. Flowering twig, B. Flower, C. Stamen, and D. Pistil.
Feronia limonia (Linn.) Swingle
Often cultivated for the sake of acid fruits.

Athaar 536, Khari.

3. Citrus Linn.

Following species of *Citrus* are cultivated.


Fruit large, pale, globose or pyriform, rind thick; pulp pinkish, sweet.

Cultivated in orchards for the sake of fruits locally known as 'Chakotra'.


Fruit oblong to ovoid, lemon-yellow, 6.0-7.5 cm across, mamillate at apex.

*Flowering & Fruiting:* March-December.

Cultivated in orchards and private gardens. The fruits are locally known as "Gal-Gal".

Fruit large, oval-obleng, mamillate, verrucose rind, yellow when ripe.

Flowering & Fruiting: July-December.

Cultivated, the fruit is locally called as "Cudariya-Nimbu".


*Limon aurantifolia* Christm. in *Linn. Pflanzen Syst.* 1:618, 1777.

Fruit globose to oval-obleng 2.5-3.0 cm across, yellow when ripe; rind thin.

Flowering & Fruiting: February-December.

Cultivated, one of the most important species of citrus from commercial point of view. Fruit locally known as "Kaghzi-Nimbu".


Key to species:

Leaflets up to 23, with a pungent smell;
mature berries black

1. *M. keenigii*

Leaflets not more than 9, without pungent smell; berries orange-red

2. *M. paniculata*


*Bergerea keenigii* Linn. *Mant.* 563, 1771.
A deciduous shrub or small tree with pungent smell, young branches lenticellate. Leaves with 19-23 oblique leaflets; margins crenate, apex acute, rachis puberulous. Flowers in large terminal corymbose panicles, fragrant. Berry ovoid, rugose, black when ripe.

Flowering & Fruiting: Summer season.

Commonly found in wild state.

Ather 65, Ziarat Meewan Shah Mohammed.


*Chalcas paniculata* Linn. Mant. 68, 1767.

*Murraya exotica* Linn. Mant. 563, 1771 (*Murracea*); FBI. 1:502, 1875;

Evergreen shrub or tree. Branches not lenticellate. Leaflets 7-9, slightly coriaceous. Flowers in short terminal or axillary corymbs. Fruit berry, orange-red when ripe.

Flowering & Fruiting: Summer and Rainy seasons.

Cultivated as hedge.

Ather 487, Bijnor Inter College, Bijnor.
XXIX. SIMARUBACEAE

*Allanthus* Deaf., nom. cons.


A deciduous tree, bark dark grey or ashy grey, shallowly fissured. Leaves unequally pinnate, crowded near the ends of branches, with a disagreeable odour; branches with papaya-like prominent leaf scars; leaflets 8-15 pairs, ovate-lanceolate, coarsely toothed, pilose when young. Flowers small, yellowish in long terminal or axillary panicles, polygamous. Sepals 5, hairy. Petals 5, longer than the sepals, oblong-lanceolate. Stamens 10 in male and 2-3 in bisexual flowers, inserted on 10 lobed interstaminal disk. Ovary 2-5 partite; style connate. Stigma peltate. Fruit a samara, spindle shaped, twisted at base.

Flowering & Fruiting: February-June.

Rare, I have seen only one tree growing in the premises of Railway Godown.

Athat 716, Near Railway Station.
Key to genera:

Leaves bipinnate; flowers lilac-blue;
fruits depressed globose, up to 5-seeded.
Ripe fruits remain on the tree till next
leaf fall .......................................................... 1. Helia

Leaves unipinnate; flowers white; fruits
oblong, 1-seeded. Fruits fall off soon
after ripening .................................................... 2. Azadirachta

1. Helia Linn.


A medium sized, deciduous tree with a globose to spreading crown. Leaves bipinnate, leaflets 9-15, ovate-elliptic, crenate-serrate, oblique at base. Flowers in axillary panicles, nearly equalling the leaves, lilac-blue in colour, fragrant. Sepals 5, ovate-oblong. Petals 5, oblong-obovate-elliptic, shorter than the sepals. Stamens 10, forming a purple tube; tube hairy inside. Ovary 5-celled; ovules 2 in each cell. Fruit ellipsoid or globose drupe, yellowish-brown and wrinkled when ripe. Seeds 5 or fewer.

Flowering & Fruiting: March-November.

Planted in parks, gardens and on road-side.

Athar 701, Nal Basti, Bijnor.
2. Azadirachta A. Juss.

Azadirachta indica A. Juss. in Mem. Mus. Par. 19:221, 1830; Fl.

Melia azadirachta Linn. Sp. Pl. 385, 1753; FBI. 1:544, 1875; FUGP.


A large deciduous tree with a globular crown and dense canopy. Leaves imparipinnate, crowded towards the ends of branches; leaflets 9-13, falcate-lanceolate, glabrous, sharply serrate, oblique at the base. Flowers in axillary panicles, equal to or shorter than the leaves. Flowers creamy-white, fragrant. Sepals 5, free or slightly connate at the base, oblong. Petals oblong-spathulate, creamy-white. Stamens 10, filaments connate to form a tube; tube hairy inside. Ovary 3-celled; ovules 2 in each cell. Fruit ovoid or oblong drupe, 1-seeded, yellow and smooth when ripe.

Extensively planted in gardens, near villages and in houses for shade. All parts of the tree are much valued for their medicinal properties.

Athar 566, Bijnor.
Celastrus Linn.


A large shrub with drooping green branches, covered with longitudinal lenticels. Leaves alternate, exstipulate, petiolate, obovate, serrate, acuminate; base cuneate; lateral nerves 5-6 pairs, glabrous, lower surface finely gland dotted. Inflorescence a thyrs. Flowers pedicellate; pedicel slightly hairy. Bracts smaller than the pedicels. Calyx 5-lobed, imbricate, rounded with fimbriate margins, thick, glabrous. Petals greenish oblong, glabrous, somewhat thick, recurved after anthesis. Stamens 5, adnate to the margin of cupular hypogynous disk; filaments very short, anthers creamy white, shorter than the petals. Style short, stigma notched.

Flowering & Fruiting: May-December.

Often found near the villages.

Athar 773, Hemrajpur.
XXXII.- RHAMNACEAE

Key to genera:

An unarmed climber; fruit with an apical wing ........................................ 1. Ventilago
An armed shrub or tree; fruit a wingless, single seeded berry ....................... 2. Zizyphus

1. Ventilago Gaertn.


Ventilago calyculata Tulcane Brand. For. Fl. 96; FBI. 1:630, 1875.

Ventilago maderaspatana Roxb. Fl. Ind. 1:629 (not of Gaertn.);
H. & A. Proc. 164 (pro parte).

A large unarmed climber, young parts pubescent. Leaves petioled, acute, with thin rusty tomentum on the veins abaxially. Flowers not seen. Fruit subglobose, winged. Wing ob lanceolate, linear with a single mid rib.

Flowering & Fruiting: March-May.

Rare, found climbing on Aegle marmelos.

Ather 555, Tajpur.

2. Zizyphus Juss.

Key to species:

Straggling shrubs.
Leaves obliquely ovate-lanceolate; prickles usually solitary .......... \( Z. \) \( \text{oenoplia} \)

Leaves ovate-orbicular; prickles paired ........................................ \( Z. \) \( \text{nummularia} \)

A moderate sized tree ........................................ \( Z. \) \( \text{mauritiana} \)


\( \text{Rhamnus oenoplia} \) Linn. Sp. Pl. 194, 1753.

A scandant, thorny shrub, young parts often rusty; thorns slightly curved Leaves obliquely ovate, oblanceolate, acute, 4-nerved at the base, rusty beneath. Flowers in short axillary cymes. Sepals 5.


Flowering & Fruiting: March-December.

Common on road-sides and in wasteland.

Ather 133, Bijnor.

2. \( Z. \) \( \text{nummularia} \) (Burm. f.,) Wt. and Arn., Prodr. 162, 1834; FBI, 1:633, 1875; Ind. Tr. 170, Reppr. ed. 1971; FPP. 59, 1978.

\( \text{Rhamnus nummularia} \) Burm. f., Fl. Ind. 61, 1769.


Straggling shrub, like \( Z. \) \( \text{oenoplia} \) but can be distinguished by its leaves which are ovate to orbicular and not oblique and the paired
spines, of which one is straight and the other curved.

Flowering & Fruiting: Rainy to cold season.

Common on dry and sandy soil.

Ather 149, Chandpur.


A medium sized tree, Bark dark-brown, young parts rusty. Leaves ovate-oblong, glabrous above, white tomentose beneath. Prickles paired, one longer and straight, the other shorter and curved. Flowers in axillary cymes. Sepals 5. Petals 5, free, spathulate. Stamens 5. Drupe red when ripe, Seed tubercled.

Flowering & Fruiting: May-February.

Ather 707, Bijnor.
XXXIII- VITACEAE

Key to genera:

Stem terete, not fleshy.

- Leaves simple ..................................... 1. *Vitis*
- Leaves pinnately compound ..................... 2. *Cayratia*

Stem sharply quadrangular, fleshy, jointed ........................................... 3. *Cissus*

1. *Vitis* Linn.


A large deciduous climbing shrub. Bark thin, dark-brown, exfoliating in long narrow strips. Leaves peltate, simple, shallowly 3-5 lobed, serrulate, acid. Flowers in leaf-opposed cymes, unisexual or bisexual. Sepals 5, connate, petals 5, connate apically, equaling or exceeding the calyx, greenish-white. Stamens antipetalous. Ovary adnate to 5-lobed disk. Fruit a globose or pyriform thin skinned berry, 2-4 seeded or seedless.

Flowering & Fruiting: January-May.

Cultivated in homes and orchards.

Ather 619, Bñnor.


Cissus cannosa Lamk. Enscyl. 1:31, 1783.


Vitis cannosa (Lamk.) Wall. ex Laws. FDI. 1:654, 1875.

A large tendril climber. Stem older parts brown, sulcate, younger parts green with short spreading hairs. Tendrils leaf opposed, 4-5 branched, nearly equalling the leaf in length; tips with adhesive disc. Leaves alternate, trifoliate; terminal larger, longer petioled; lateraes, smaller, oblique and with shorter petioles, sometimes with very unequal halves; margins dentate, apex acute, base cuneate; lateral nerves 4-6 pairs. Flowers in axillary, branched cyose, flowers greenish-white, shortly pedicelled. Sepals 4. Petals 4. Stamens 4, antipetalous; filaments dilated at the base. Fruit depressed, globose berry resembling a black pepper when dry, deep violet in colour. Seeds roughly trigonous, convex at the back with a median longitudinal ridge and 4-6 transverse ridges on either sides of the median ridge.

Flowering & Fruiting: August-December.

Occasionally met with climbing on other trees.

Ather 387, Dharam Nagri.

3. Cissus Linn.

Cissus quadrangula Linn. Mant. 39, 1767.

Vitis quadrangularis Wall. ex Wt. & Arn. Prodr. 51, 1834; FBI. 1:645, 1875.
A small tendril climber. Stem jointed, fleshy, sharply four angled to four winged. Constricted at the nodes and sometimes tinged with purple. Leaves simple, alternate, reniform, cordate, serrulate-dentate, obtuse, petioled, the leaves remain on the stem for a short duration, then fall off. Never seen in flowering, propagated vegetatively.

Cultivated in rockeries.

Ather 644, District Judge's Court.
XXXIV. SAPINDACEAE

Key to genera:

Shrubs or trees.

Trees with pinnate leaves and wingless fruits.

Fruit rind with conical tubercles; ... pulp white, edible; seeds brown ...... 1. *Nephelium*

Fruit rind not tubercled; pulp inedible.

Petales 4-5; fruit rind saponaceous ...................... 2. *Eapindus*

Petales 0; fruit rind not saponaceous ...................... 3. *Schleicheria*

Shrubs with simple leaves and winged fruits .................. 4. *Dodonaea*

Climber with ternate leaves and inflated fruits .................. 5. *Cardiospermum*

1. *Nephelium* Linn. = *Litchi* Sonner

*Nephelium litchi* L. Amad. in Mem. Mus. Par. 18:30, 1829.

*Nephelium dimorpus* Hook. f. & Thomas, ex Hook. f. FBL. 1:688, 1875.

*Litchi chinensis* Sonner Voy. Ind. 3:225, 1789.

*Litchi sinensis* J.F. Gmel. Syst. 635.
A medium sized to large tree. **Leaves** pinnate, leaflets 2-4 (-6) pairs, coriaceous, shining above, glaucous below, elliptic-oblong to lanceolate, sharply acute, margins sometimes undulate. **Flowers** minute. Calyx cup shaped, obscurely toothed. **Petals** none. **Fruit** oblong; rind with conical tubercles, bright red when ripe; pulp white, transluscent. **Seeds** dark brown with a prominent aril.

Flowering & Fruiting: February-June.

Occasionally cultivated in orchards.

Athar 503, Jhau Road.

2. *Sapindus* Linn.

*Sapindus emarginatus* Vahl **Symb.** 3:954. 1794.

*Sapindus trifoliatus* Hiern. in FDI. 1:682. 1975, pro parte (non **Linn.**);


A medium sized tree. **Crown** globular, spreading, younger parts and inflorescence tomentose. **Leaves** paripinnate, alternate, exstipulate; leaflets 4-6, oval-oblong, apex emarginate or rounded, sometimes acute, glabrous, pubescent beneath, coriaceous. **Flowers** in terminal, pubescent panicles, white hairy, shortly pedicelled. **Sepals** 5, free, unequal. **Petals** 5, spathulate, hairy. **Stamens** 8; filaments pilose. **Ovary** 3-lobed, rusty tomentose. **Style** hairy at base; stigma 3-lobed. **Fruit** fleshy-schizocarp, globose; mericarps divaricate at maturity, 1-seeded; pericarp saponaceous. **Seeds** globular, black.

Flowering & Fruiting: Summer to rainy season.
Often found under cultivation.

Ather 569, Principal's Residence, C.C.I.C. Bijnor.


A medium sized tree with grey bark. Leaves paripinnate, leaflets 4-6, size decreases from terminus to base, oval-oblong, apex emarginate, glabrous above, pubescent beneath; younger leaves beautiful red. Flowers polygamous, in drooping racemose, yellowish white. Some trees with male flowers only. Sepals 4-6, valvate. Petals 0. Disk annular, wavy. Stigmas 5-8, longer than calyx and inserted within the disc; filaments pilose. Fruit smooth, indehiscent, pointed, 1-seeded, crustaceous. Seeds with fleshy aril.

Flowering & Fruiting: March-August.

Cultivated on road-sides or as an avenue tree.

Ather 569, Dharam Nagri.

4. *Dodonaea* Linn.


An evergreen shrub with thin brown bark. Leaves simple, narrowly obovate, entire, gland dotted, apex obtuse; with a characteristic smell. Flowers in short axillary or terminal cymes, polygamous or polygamous-dioecious. Sepals 3-5, viscid, hairy. Petals 0. Stamens 8-10; filaments short. Disk inconspicuous. Fruit a compressed capsule with 2-3 longitudinal wings.

Flowering & Fruiting: November-April.

Very popular as a hedge plant.

Athar 499, Mission Compound.

5. Cardiospermum Linn.


Flowering & Fruiting: August-November.

Common among the hedges.

Athar 382, Hemrajpur.
XXXV. ANACARDIACEAE

**Mangifera** Linn.


A small to large tree (depending on the variety), crown globose, dense. Bark dark-grey, rough. Leaves alternate, crowded at the ends of branches, oblong-lanceolate, margins wavy; young foliage red-brown, flaccid. Flowers in large terminal panicles, small, yellowish, polygamous. Sepals 4-5 (-6), hairy, free, ovate-oblong. Petals 4-5, ovate-oblong-lanceolate. Stamens 4-5, usually only one perfect. Disk 5-lobed. Ovary 1-celled. Fruit a drupe. Size, colour and flavour vary with variety to variety.

Flowering & Fruiting: February-August.

The most extensively cultivated fruit tree of the area.

Athar 634, Bijnor.
XXXVI- MORINGACEAE

Moringa Bum.


Cullandina moringa Linn. Sp. Pl. 381, 1753.

A small tree. Bark ash coloured, thin. Leaves 3-pinnate; pinnae 6-12 pairs, leaflets 5-7, ovate or obovate-oblong. Flowers in large axillary panicules, white to creamy-white, zygomorphic. Sepals 5, connate, lobes, unequal, odd sepals largest and somewhat petaloid. Petals 5, unequal, creamy white with yellow dots, narrowly spatulate. Stamens 5 perfect and 5 staminodes; filaments villous at base. Carpels 3, connate; ovary densely villous, 1-celled. Fruit long, pendant, capsule, 3-valved, ribbed. Seeds winged.

Flowering & Fruiting: September-February, March-June.

Cultivated, in houses and gardens.

Athaar 79, Prasad Academy, Bijnor.
XXXVII- FABACEAE (PA-VILIONACEAE nom. alt.)

Key to genera:

Leaflet one.

Flowers in various types of inflorescence.

Pods jointed.

Pods compressed; upper suture entire, lower suture shallowly incised ......................... 1. Desmodium

Pods turgid, breaking up into one seeded segments; joints swollen ......................... 2. Alysicarpus

Pods not jointed.

Plants with hairy pod, single seeded .................................................. 3. Indigofera

Plants with basifixed hairs; pod glabrous, many seeded, exerted or included in the persistent calyx .................................................. 4. Crotalaria

Flowers solitary, axillary, throughout the length of branch, yellow; pod long silky hairy (at least on sutures), a prostrate herb ........................................ 5. Haylandia

Leaflets two or more.

Leaflets two or three.
Leaflets 2, digitate, gland dotted; flowers in racemes, almost concealed by the bracts; pods jointed, prickly .... 6. Zornia

Leaflets 3.

Leaflets digitate, entire.

A prostrate or erect herb; leaflets small; flowers in raceme; corolla exerted; pod 2-seeded, appressed hairy ......................... 4. Crotolaria

An erect small shrub; leaflets large, oblique; flowers in large condensed heads; corolla included; pod 1-seeded .......... 7. Daughania

Leaflets pinnate.

Herbs.

Leaflets toothed.

Pods long, slightly falcate ..................... 8. Trigonella

Pods short,

Pods spiral or sickle shaped; racemes short ................... 9. Medicago

Pods not spiral or sickle shaped;

1-seeded; racemes long .................... 10. Heliotrop
Leaflets entire.
Climbing or trailing herbs.
Leaves gland dotted beneath, broadly obovate or rounded; corolla yellow.
Pods 4-7 seeded, with depressed lines between the seeds; seeds strophioleate .... 11. Atylosia
Pods 2-seeded not with depressed lines between the seeds; seeds not strophioleate .... 12. Rhynchosia
Leaves not gland dotted beneath, oblong-lanceolate, dark-green above, paler beneath; pods straight, brown; seeds dull black with white blotches; corolla reddish .... 13. Iteparvus
Erect or prostrate, not climbing; flowers pink-purple.

Erect, hairy; hairs centrally fixed; pods subtetragons, septate between the seeds, 3-keeled at the back, 8-12 seeded .............. 14. Symopsis

Prostrate; hairs simple; pod flat, jointed, upper suture entire, lower shallowly incised, joints 3-5 ............ 1. Desmodium

Trees,

Branches prickly; pods 4-5 seeded ......................... 13. Erythrina

Branches smooth, pods 1-seeded ............................ 16. Butea

Leaflets more than three (3-5 in Dalbergia).

Trees,

Leaflets broadly ovate, apiculate 3-5, odd pinnate; pods flat, 2-3 seeded, indehiscent, apex obtuse, base narrow ..................... 17. Dalbergia
Leaflets small, linear oblong;
pods long, narrow, terete,
dehiscent, septate between
the seeds ...................... 18. Sesbania

Herbs or shrubs.

Plants without tendrils.

Climbers.

Style beardless.
Stamens 9; seeds red
and black, polished
(this plant maintains
fresh green colour
oven in herbarium
specimen) ............. 19. Abrus
Stamens 10, 2-adel-
phous; seeds not
polished; pods covered
with dense irritant
hairs ................. 20. Musuna

Style bearded inside;
flowers bright-blue with
orange or white centre .. 21. Clitoria

Erect or prostrate herbs or
shrubs, not climbers.
Leaves striate veined;
hairs basified; anthers
nuticous ................. 22. Iephrasia
Leaves not striate veined;
hairs centrally fixed;
anthers apiculate .......... 3. Indigofera

Plants with tendrils.
Leaflets abortive or 2, entire;
staminal tube truncate at the
mouth .......................... 23. Lathyrus
Leaflets 5-13 pairs, entire;
staminal tube oblique at the
mouth .......................... 24. Vicia

1. Desmodium Desv., nom. cons.

Key to species:

Leaves 3-foliolate.

Flowers in axillary, unbellate heads;
pods silvery pubescent; shrubs ............. 1. D. triangulare
Flowers 1-3 axillary; pods not silvery
pubescent; small trailing herbs .............. 2. D. triflorum

Leaves 1-foliolate.

Leaves scabrous above, broadly ovate
or suborbicular .......................... 3. D. valutinum
Leaves glabrous above, oblong-ovate ...... 4. D. gartenianum


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**Damasium cephaletes** (Roxb.) Wt. & Arn. Prodr. 224, 1834; FDI. 2:161, 1876; **FUGP.** 1:282 (incl. var. congestum Prain); FSC. 117.

An erect suffrutescent shrub or undershrub. Stem often trigonous, tending to become terete when old, hairy; hairs white appressed. **Leaves trifoliolate; terminal leaflet the largest, oblong-ovate, acute on both the ends; nerves 8-15, prominent beneath. Pods silvery pubescent, in axillary umbellate clusters, 2-3(-4) jointed.**

**Flowering & Fruiting:** August-December.

Occasionally found in scrubby habitats.

Ahar 292, Jalalpur.


**Hedysarum triflorum** Linn. Sp. Pl. 749, 1753.


**Flowering & Fruiting:** July-Aug
Abundant, found in a variety of soil from humus rich grassland to sandy soil of river bed.

Ather 84, Bijnor and Randi.


An erect, spreading undershrub, densely hairy with simple and hooked (on stem only) hairs. Leaves unifoliolate, broadly ovate or orbicular, scabrous above, softly hairy below, base cordate or truncate. Flowers in long, hairy racemes, raceme with simple and hooked hairs. Calyx densely hairy, equaling the corolla. Corolla glabrous, purple. Pods not seen.

Flowering & Fruit: October-January.

Rare, occasionally found in scrubby situations.

Ather 365, Dara Nagar.

Hedysarum gangeticum Linn. Sp. Pl. 746, 1753.

Hedysarum maculatum Linn. Sp. Pl. 746, 1753.

Drewalia maculata (Linn.) DC. Prod. 2:327, 1823.

Differences from preceding species in having slightly angular stem; glabrous adaxial surface of the leaf, and the calyx teeth longer than the tube.

Flowering & Fruiting: Rainy and early winter season.

Abundant in road side hedges.

Athar 75, Vidur Kuti Road.


Key to species:

Leaves broadly-oblanceolate, ovate or orbicular; often decollourised along the mid-rib.

Pedicels not moniliform .......................... 1. A. monilifer

Pedicels moniliform .................................. 2. A. vaginale

Leaves linear-lanceolate .......................... 3. A. bruneifolius

1. Alysicarpus monilifer (Linn.) DC. Prod. 2:253, 1823; FBL. 2:197, 1876; FUGP. 1:355, Rep. ed. 1960; Fig. 78, 1978.

Hedysarum moniliferum Linn. Mant. 1:102, 1767.

An annual herb, prostrate or ascending, pluricaulis from the base, hairy. Leaves oblong-elliptic or orbicular; the mid-rib region often with a white irregular band, glabrous above, hairy below. Flowers creamy-pink in axillary racemes. Pedicels 4-8 jointed, turgid, moniliform, hairy.
Flowering & Fruiting: August-November.

Common in grasslands.

Ather 182, Prithipur.


*Alysicarpus nummularifolius* sensu DC. Prodr. 2:353, 1823.


Flowering & Fruiting: Rainy season.
Abundant, this is the abundant most species of *Alysicarpus*, found in grassland, sandy soil and on old walls.

Ather 157, Near Bid Cen.


A suffrutescens, nearly erect annual herb. Leaves linear-lanceolate, acute; stipules longer than the petiole. Flowers pink-purple. Pod 2-4 jointed, neither veined nor reticulate.

Flowering & Fruiting: August-December.

Occasionally found in grassy localities.

Ather 367, Jalalpur.

3. *Indigofera* Linn.

Key to species:

Pods 1-2 seeded; prostrate herbs.

Leaves odd-pinnate; pods 2-seeded .......... 1. *I. linneas*

Leaves simple, lanceolate; pods 1-seeded ........................................ 2. *I. linifolia*

Pods more than three seeded.

Erect, shrubby plants.

Recomes long; calyx densely brown

hairy; pods densely hairy ............ 3. *I. estragalina*
Racemes short; calyx with silvery hairs; pods sparsely hairy with white hairs ................................. 4. I. tinctoria

Prostrate herbs; racemes 2-4 flowered;

corolla caduceous .............................................. 5. I. glabra


Hedysarum prostratum Linn. Mant. Pl. 1:102, 1767 (non I. prostrata Willd. 1803).

Hedysarum prostratum Bum. f. Fl. Ind. 166, t. 95, f. 1, 1768 (non Linn. 1767).


A prostrate, hairy annual; hairs white, centrally fixed. Leaflets 5-9, obovate. Flowers in axillary, short racemes, red. Pods in axillary clusters, 2-seeded, acute.

Flowering & Fruiting: Rainy season.

This is the most abundant species of Indigofera in this area. Found in grasslands, on road sides, and raised borders of the fields.

Ather 363, Jhalu Road.

Hedyarum linifolium Linn. s. Suppl. 331, 1781.

A prostrate or ascending herb, puberulent from the base, white hairy. Leaves linear, lanceolate, 1-foliolate, appressed white-hairy on both surfaces. Flowers in axillary racemes, red. Pods globose, 1-seeded, hairy.

Common in the flood plains of Ganga.

Ather 23, Raudi Chat.


A small spreading shrub, stem hairy; centrally fixed hairs not very prominent. Leaves odd-pinnate; leaflets 5-7, obovate, sometimes slightly unequal sided, shortly petioled, hairy on both the surface, darker green above and paler beneath. Flowers in long racemes, peduncle hairy; buds erect and close set, flowers deflexed and distant. Calyx densely brown hairy. Corolla red purple, longer than the calyx. Pod not seen.

Flowering & Fruiting: Rainy season.

Not uncommon, found in waste lands.

Ather 143, Bid Gah.

Identification of this plant, as it is a recently reported taxon from upper Gangetic Plain, is based on the collection of B.V. shetty from Pali Distt. Rajasthan, deposited at C.U. Field book number is 1079.

An undershrub. Leaves odd pinnate, 7-9 foliato, the terminal leaflet is usually broader than the lateral ones, bluish-green in colour. Flowers pink in short spike like racemes. Pods blackish, slightly falcate, pointed, suture slightly swollen and lighter in colour. Whole plant turns black when dry.

Duthie (FUGP) described the mature pods as, "glabrous", but in my specimens the pods are decidedly white hairy, though the hairs are small and sparse.

Not uncommon, found in grassland and wasteland.

Ahar 290, Isplamur.


A slender prostrate annual; branches sometimes ascending. Younger parts hairy, older parts sparsely hairy. Leaflets 5, terminal leaflets broader, lateral narrower, hairy on both surfaces. Flowers in 2-4 flowered, lax, axillary racemes. Calyx densely hairy. Corolla red, caduceous. Pod straight, glabrous; sutures swollen, lighter in colour.

Flowering & Fruiting: Rainy season.

Occasionally found in sandy soil.

Ahar 158, Kherki.
4. *Crotalaria* Linn.

Key to species:

Leaves simple.

Pods exerted; flowers yellow.

Plants erect, densely pubescent;
leaf bases not oblique .............. 1. *C. mysorensis*

Plants prostrate, thinly hairy;
leaf bases oblique .................. 2. *C. prostrata*

Pods not exerted, plants erect;
flowers bluish-white; leaves linear-
lanceolate ................................ 3. *C. sessiliflora*

Leaves trifoliate, flowers yellow, pods
2-seeded .................................. 4. *C. medicaginea*


*Crotalaria ferruginea* sensu Duthie, FUGP. 1:203 (non Grah. ex Benth. 1843).

An erect, golden-brown hairy herb, branched; branches may be divaricate. Leaves subsessile or sessile, stipulate, elliptic, oblong, lanceolate, entire, obtuse, sometimes mucronate, suncate at the base, hairy on both surfaces, gland dotted. Flowers crowded towards the apex. Calyx densely golden-brown hairy. Corolla yellow, not exerted. Pods broad, inflated, twice as long as the calyx. Seeds shining, smooth.
Flowering & Fruiting: September-December/January.
Often found on the borders of cultivated fields.
Ather 362, Gajraula.


An annual herb with prostrate or slightly decumbent branches; branches spreading, hairy. Leaves nearly sessile, entire, obtuse or acute, silvery appressed hairy beneath and brownish hairy above; base unequal. Flowers in 2–5 flowered racemes; bracteoles hairy. Calyx hairy. Corolla hardly exserted. Pods many seeded; seeds beautiful olive-green, polished.

Flowering & Fruiting: March–June

Often found in Eucalyptus plantations.
Ather 275, Rawli Road.


Flowering & Fruiting: September-January.

Often found among the grasses.

Athar 425, Hemrajpur.

4. *Cyrtaconia pachycarpa* Linn. Encycl. 2:201, 1786; FBI. 2:81
    (incl. var.), 1876; FUGP. 1:190, Repr. ed., 1960; de Munk Reinwardtia

Prostrate or erect, annual hairy herbs; hairs appressed or spreading; in prostrate forms the branches often divericate. Leaves 3-foliate, petiolated, appressed hairy below and thinly hairy or glabrous above; leaflets narrowly obovate, entire, cuneate. Flowers in leaf opposed racemes. Calyx densely hairy, shorter than the corolla. Corolla yellow with red blotches. Pods subglobose, with a pointed beak, appressed hairy. Seeds 2.

Flowering & Fruiting: July-December.

Abundant in wastelands and grasslands, prefers sandy soil.

Athar 418, 44, Kherki and Mandalward Road.

B. *Heylandia DC.*

*Heylandia latifolius* DC. Mem. Leg. 6:201; W. & A. Prodr. 180; Reyle

A small deep rooted annual herb, prostrate, branching from the base in all directions; branches thinly hairy with long, golden, spreading hairs. Leaves short petioled, ovate, entire, acute; base cordate, equal or unequally margins with scattered long hairs. Flowers solitary, axillary, short petiole clad, throughout the length of
branches. 

Pedicels yellow. Pods pubescent when young but thinly hairy at maturity, with a persistent stylo base; mature pod flat.

Flowering & Fruiting: February-May.

Often found along the railway track.

Atheta 327, Jhalra.


An annual, prostrate or nearly erect herb. Stem glabrous or hairy. Leaves digitately 2-foliately, lanceolate, acute at both the ends or oblique rounded at the base; usually black dotted below, stipulate; stipules black punctate. Flowers in flat, lax, bracteate, spikes of variable length. Bracts nearly concealing the flowers and resembling the stipules. Corolla yellow. Pods exerted, 2-7 segmented, segments with hooked retrorsely hairy bristles.

Flowering & Fruiting: Rainy and winter season.

Abundant in grassy, shady and damp localities.

Atheta 177, Bijner.

7. Mauhania J. St., Hill., nom. cons.


An erect, woody shrub. Leaves alternate, long petiolated, 3-foliate; terminal leaflet broadly lanceolate, lateral leaflets unequal and oblique at the base; outer bases of both the leaflets are cordate or rounded, while the inner ones are cuneate or acute. Leaves red tinged or blotched (at least in herbarium specimen). Flowers in condensed racemes, shorter than the petiole. Pedas turgid, slightly pubescent; persistent, style base eccentric. Seeds 2, red-brown.

Flowering & Fruiting: Late rainy to winter season.

Occasionally found near villages.

Ather 371, Jalalpur.

8. Trigonella Lim.

Key to species:

Stipules lanceolate.

- Calyx segments shorter than the tube;
  - pedae transversely veined, 5-6 seeded ...... 1. T. corniculata
  - Calyx divided half way down; pedae not
  - transversely veined, 10-20 seeded .......... 2. T. foenum-graecum
Stipules semi-sagittate .................. 3. \textit{L. incisa}


A prostrate or suberect, extensively branched annual. Leaves trifoliate; leaflets obovate, rounded, emarginate, cuneate, serrate. Flowers yellow, in dense racemes, pedicelled. Corolla longer than the calyx. Pod falcate-oblong, transversely veined, 5-8 seeded.

Flowering & Fruiting: February-May.

Very common in grasslands.

Athar 116, Indira Park.


An erect, branched herb, with a characteristic smell. Leaflets obovate, faintly serrate at the top. Flowers sessile, yellow. Pod straight, with a long persistent beak, without transverse reticulation, hairy.

Flowering & Fruiting: January-May.

Athar 285, Vidur Kuti Road.


An extensively branched, spreading or ascending annual. Stem eulcate, thinly puberulous, basal part red-tinged. Leaves trifoliate; leaflets Cuneate, sharply dentate, hairy, more so on adaxial surface and on
nerve; nerves 3-6 pairs; stipules semianagitate. **Flowers** in few flowered axillary racemes, yellow. **Pods** long, falcate, reticulately veined. **Seeds** 12-18, rhombic, tuberou, yellow.

**Flowering & Fruiting**: January-March.

Occasionally found in cultivated fields.

Ather 98, Jain Farms.


**Key to species**:

Pods 1-seeded, without hooked projections, usually blackish in colour ******************

1. *M. lupulina*

Pods more than one seeded, spiral, with hooked projections, yellow-brown in colour ******************

2. *M. polymorpha*


A prostrate annual herb. Stems appressed hairy-spreading hairy. **Leaves** trifoliate; leaflets obovate, cuneate at the base, apex notched, with a short mucro, lower margins entire, top dentate. **Calyx** divided half way down. **Pods** many in a cluster, turning black on ripening, sickle shaped, faintly reticulate.

**Flowering & Fruiting**: Winter season.

Usually found on the beds of canals and streams when they dry up in winter. Also found in grasslands.
Athar 74, Mandowar.


*Medicago lepaspaeae* Dear. in Lank. Encycl. 3:637, 1792.


A proscumbent or straggling herb. Leaves obvate, dentate; stipules lanciniate. Flowers in 2-6 flowered racemes, bright yellow. Pods 2-4 coiled, covered with double rows of hooked bristles, 2 or more seeded.

Flowering & Fruiting: January-April.

Very common in agricultural fields.

Athar 88, Bijnor.

10. *Helilatus* Hill.

Key to species:

Flowers yellow ........................................ 1. *H. indica*

Flowers white ........................................... 2. *H. alba*


*Trifolium indicum* Linn. Sp. Pl. 768, 1753.
*Melilotus parviflorus* Desf. Fl. Atlant. 2:192, 1798; FBl. 2:59, 1876.

An erect, branched, annual herb. Leaves 3-foliate; leaflets ovate, acutely serrate, cuneate at the base, rounded at the apex. Raceme dense, axillary. Calyx shorter than the petals, teeth deltoid. Corolla yellow, pods glabrous, 1-seeded.

Flowering & Fruiting: Winter season.

Abundant, found in grasslands, lawns, wastelands etc.

Ather 135, Biijne.


This plant can be easily distinguished from the preceding species by its larger size, larger white flowers, raceme and pods. Sometimes, this plant attains a height upto 150-160 cm.

Flowering & Fruiting: Winter season.

Very common in agricultural fields.

Ather 66, Jhaira.

11. *Atyletea* Mt. & Am.

Key to species:

Leaves densely grey hairy; pods densely hairy not reticulately veined .................. 1. *A. serrataboosides*

Leaves with scattered hairs; pods distinctly reticulately veined .................. 2. *A. platycarpa*

Deliches scarabaeoides Linn. Sp. Pl. 2:1020, 1753.

A medium sized climber with a woody base. Branches grooved, grey hairy, younger parts ferruginous hairy. Leaves trifoliate, petioled; terminal leaflet oblong-elliptic, obtuse; lateral leaflets oblique, all grey tomentose. Flowers in 2-5 flowered axillary racemes. Calyx densely grey silky; teeth longer than the tube.

Corolla exerted, yellow. Pode densely hairy not reticulate veined, persistent style base eccentric, septate between the seeds.

Flowering & Fruiting: Late monsoon and winter season.

Occasionally found in grass lands and among the bushes near villages.

Athal 293, Jalalpur.


A prostrate herb, internodes long. Stem thinly hairy with long and short hairs. Leaves long petioled, trifoliate; terminal leaflet broadly rhomboid, entire, thinly hairy, base cuneate, apex acute; lateral leaflets oblique, acute. The terminal leaflets are relatively smaller than the laterals. Flowers 1-2 in leaf axils, yellow. Pode flat-tish, thinly hairy, distinctly reticulate, curved. The persistent stylar base eccentric, towards the concave suture, 5-7 seeded.
Flowering & Fruiting: August–December.

Often found in the flood plains of Ganga.

Athar 398, Jalalpur.

12. Rhynchosia Lour., nom. cons.


A small twining or trailing annual herb, stem slender, shortly hairy. Leaves trifoliolate, petiolate; the terminal leaflet rhomboid, acute; laterale ovate-elliptic, glabrous except the hairy nerves, gland dotted beneath. Flowers in axillary, long peduncled 5-10 flowered racemes. Calyx divided half way down, corolla longer than the calyx, yellow, purplish streaked. Pods Oblong-falcate, shortly gland hairy, 2-seeded, shortly beaked.

Flowering & Fruiting: April–November.

Commonly found among hedges on road sides and the edges of orchards.

Athar 135, Barooki.


A medium sized climber. Nearly all parts, more or less black gland dotted, but the glands more frequent on stem. Stem shortly hairy, angular. Leaves trifoliate, all the three leaflets nearly similar, oblong-lanceolate, obtuse, entire, glabrous and greyish above, hairy beneath, the halves slightly unequal, nerves more prominent below; lateral nerves 5-7 pairs. Flowers in lax, axillary 3-6 flowered racemes. Corolla reddish. Pods linear, acute 7-11 seeded. Seeds brown-black.

Flowering & Fruiting: August-November.

Rare in this area, sometimes found in Eucalyptus plantations. Fairly common in nearby forest tracts.

Athar 373, Jalalpur.

14. Symposia DC.


Deliches peperaleides Lank. Encycl. 2:300, 1786.


An erect tall herb with sulcate and hairy stem, hairs only on ridges. Leaves trifoliate, petioled; leaflets hairy on both the surfaces. Hairs on adaxial surface, finer and scattered, white; on abaxial surface, coarser and dense; terminal leaflet elliptic-ovate, acute on both the ends, distantly dentate; lateral leaflets slightly
oblique, or with unequal halves, there is a slight difference between the lengths of petiolules of both the lateral leaflets of the same pair; lateral nerves 4–6 pairs. Flowers in axillary short racemēs, shortly pedicelled, purplish. Ovary densely hairy. Pod hairy in initial stages later glabrous.

Flowering & Fruiting: October–January.

Often cultivated as fodder crop, sometimes met with as an escape. Athar 159, Bijnor.

15. Erythrina Linn.


Flowering & Fruiting: March–June.

Cultivated as ornamental.

Athar 432, Catholic Mission Compound.


Erythrina monosperma Lamk. Encycl. 1:391, 1783.


**Flowering & Fruiting:** March–June.
Extensively planted as an important timber tree.

Ather 625, Bhujer.

18. *Sebania* Linn.

**Key to species:**

Unarmed tree; leaflets 14-20 pairs; wings with a minute or obscure, obtuse auricle ..... 1. *S. sesban*

Armed herbaceous shrub; leaflets 20-40 pairs; wings without a minute or obscure, obtuse auricle ................................. 2. *S. bispinosa*


_Aeschynomene sesban_ Linn. Sp. Pl. 714, 1753.


Flowering & Fruiting: November-April.

Often planted near villages.

Ather 625, Jhalu.


An erect branched annual shrub, usually branching in upper half; stem, branchlets and leaf rachis beset with scattered, curved prickles. Leaflets 20–40 pairs, linear-oblong, small. Flowers 2–6 in short axillary racemes. Calyx teeth short. Corolla yellow with red blotches; wings without a minute or obscure, obtuse suricle. Pede straight, beaked, submoniliform.

Flowering & Fruiting: September–November.

Commonly found in cultivated field.

Ather 352, Barrage Road.

19. Abrus Adans.


Glycine ahrus Linn. Sp. Pl. 733, 1753.

A woody medium sized climber. Stem slender, woody at base, younger portions silky tomentose, older portions thinly hairy. Leaflets 12–20 pairs, elliptic-oblong, glabrous above, thinly silky beneath. The leaves retain their fresh green colour in herbarium specimens over a long period. Flowers in short axillary and terminal racemes, lower flowers bisexual, upper male. Corolla purple–white. Pede oblong, turgid, thinly silky-pubescent, 3–6 seeded, septate between
Abrus precatorius Linn.

Note: characteristic red seeds
the seeds. Seeds subglobose, bright-red with a black area around the hilum.

Flowering & Fruiting: July-January.

Very common among hedges on road sides.

Atha 671, Near Eid Oah, Bijner.

In all probabilities, the ants seem to play an important role in pollination of this plant. I have always found the inflorescence harboured by a large number of ants.


Mucuna pruriens (Linn.) DC.
Flowering & Fruiting: August-January.
Found among the hedges near villages.
Ather 406, Jhandapur.

21. Clitorea Linn.


An extensive, herbaceous climber. Stem appressed hairy. Leaves imparipinnate; leaflets 5, slightly hairy beneath on the veins other wise glabrous, stipules relatively broader than the stipules. Flowers solitary or paired, axillary, pedicelled; bracts lanceolate, hairy, one or two nerved; bracteoles larger, orbicular, cordate, entire, extensively innervated, apex rounded or retuse. Calyx membranous. Corolla blue with a white centre. Pods linear-oblong, beaked, flat, 6-10 seeded.

Flowering & Fruiting: May-April.

Introduced as an ornamental, but has now got naturalised and established as a wild plant.
Ather 220, Near Officers Quarters, Bijnor.


Craega purpurea Linn. Sp. PI. 752, 1753.

A much branched undershrub, woody at base, Young branches grey tomentose. Leaves imparipinnate; leaflets 7-19, oblong-ovate,
appressed hairy beneath. **Flowers** in axillary or terminal racemes, bright-purple. **Peda** linear, compressed, 4-6 seeded.

Flowering & Fruiting: May–December.

Common on sandy soil.

Atar 366, Mandawar.

22. **Lathyrus** Linn.

**Key to species:**

Stem winged; stipules semiasagittate at the base .................................................. 1. *L. sativus*

Stem not winged; stipules linear or foliaceous.

- Leaves well developed; stipules linear:
  - **flowers** red .................................................. 2. *L. sphaericus*
  - Leaves abortive; stipules foliaceous:
    - **flowers** yellow .................................................. 3. *L. sphaca*


A glabrous much branched annual, with quadrangular, green and winged stem. **Leaves** 2-foliate, petiole winged, rochis ending in a simple or trifid tendril; leaflets linear-lanceolate, entire, acute, with 3 main nerves. **Stipules** semiasagittate at the base, margins slightly ciliate. **Flowers** solitary axillary, peduncles longer than the petiole, with two appendages near the base of flower one being smaller and the other slightly larger. **Calyx** campanulate, divided
nearly half way down, each tooth single nerved. Corolla reddish purple, Stamens 10 (9+1), the mouth of tube not oblique. Style curved at right angle; stigma flattened and bearded. Pods with conspicuous wings on either side of the dorsal suture.

Flowering & Fruiting: December-April.

Common in cultivated fields.

Althar 39, Karachi.


Flowering & Fruiting: November-April.

Occasionally found among the grasses.

Althar 254, Near Khorki.


A much branched, ascending annual, branching from near the base. Stem wingless. Leaves abortive. Stipules foliaceous, paired, appressed to the stem, parallel veined, truncate, hastate, entire and acute; tendrils unbranched, long than the stipules. Flowers 1-2 on a peduncle exceeding the stipule; yellow. Pods oblong, glabrous,
slightly curved, 3-7 seeded, internally with faint hairy lines between the seeds.

Flowering & Fruiting: November-April.

Abundant on the borders of agricultural fields.

Ather 204, Bijner.

**Lathyrus odoratus** Linn. is extensively grown as a winter annual.

24. **Vicia** Linn.

Key to species:

Erect herbs; flowers white, with blackish blotch near the corolla base ...................... 1. **V. faba**

Climbing or prostrate herbs.

Leaflets 3-5 pairs; flowers pink-violet; corolla much exerted; pods 6-10 seeded .. 2. **V. sativa**

Leaflets 8-11 pairs; flowers lilac; corolla hardly exerted; pods 2-seeded ... 3. **V. hirsuta**


An erect, annual herb. Stem 4-angled. Leaflets 2-3 pairs, elliptic-oblong, rachis not ending into a tendril but flescid apical point. Flowers in 2-5 flowered, erect racemes, creamy-white with blackish blotch. Pods thick, linear, velutinous, 4-5 seeded.

Flowering & Fruiting: November-February.

Cultivated for green pods.

Ather 255, Bijner.

An annual, slender tendril climber or suberect herb. Stem angular, glabrous or obscurely downy. Stipules small, lanceolate, oblique, deeply toothed and cuspidate, base sagittate or with a single auricle. Leaves peripinnately compound, leaflets 3-5 pairs, elliptic lanceolate, shortly petiolated, margins shortly ciliate, mucronate. Flowers solitary, or paired. Calyx hairy, teeth lanceolate, subulate, mouth oblique. Corolla reddish-blue, twice the calyx.

South of the staminal tube oblique; Style abruptly incurved, hairy just below the stigma, hairs on the lower side are longer than on the other side. Pod 6-10 seeded.

Flowering & Fruiting: Cold season.

Abundant in wheat fields.

Ahar 47, Bakhshiwala.


A scarcely hairy or almost glabrous climbing annual. Stipules semi-sagittate, often toothed at the base, which may sometimes be quite long, hairy. Leaves very shortly petiolated; leaflets 8-11 pairs, entire, apex truncate and mucronate, upper surface has very distinct opaque dots, peduncles much shorter than the leaves, 3-4 flowered. Corolla white, slightly exserted. Stigma hairy all round.
Pods short, constricted between the seeds when mature, 2-seeded.

Flowering & Fruiting: Cold season.

Abundant in wheat fields.

Athin 57, Bakhshiwala.
Key to genera:

Armed trees or shrubs.

Flowers yellow.

- Pods moniliform, glabrous .................. 1. Parkinsonia
- Pods short, covered with waxy spines .................. 2. Cassolpinia

Flowers orange-red, blotched with yellow; pod glabrous .................. 2. Cassolpinia

Unarmed trees, shrubs or herbs.

Flowers yellow.

- Pods elongated, turgid .................. 3. Cassia
- Pods short, flat; inflorescence and pods ferruginous .................. 4. Velophorum

Flowers otherwise.

- Pods strap shaped.

Leaves simple, deeply cleft at tip .................. 5. Bauhinia

Leaves compound.

Flowers pure red-scarlet in dense corymbs .................. 6. Saraca

Flowers blotched with yellow/white, in large panicles ..... 7. Velonix

Pods turgid, moniliform, recurved, fibrous .................. 2. Tamarindus
1. Parkinsonia Linn.


A large spiny, straggling shrub. Leaves bipinnate, the primary rachis reduced to sharp woody spines which have 2-6 pinnas congested in their axils; leaflets very small, distichous, numerous, the leaflets of each pair often remain appressed to each other. Flowers yellow in axillary racemes; odd petal blotched with red, red elongated, striate, glabrous.

Flowering & fruiting: October-June.

This plant gives support to some climbers like, *Coccinia grandis* and *Clitoria ternatea* etc.

Common. Extensively planted by Department of Social Forestry, on roadside.

Athar 228, Dharam Nagri.

2. Caesalpinia Linn.

Key to species:

- Straggling shrub; flowers yellow; pod covered with wavy spines

- Erect small tree; flowers orange-red; pod glabrous


Guilandina Bonduc Linn. sp. pl. 381, 1753, pro parte.

Guilandina bonducella Linn. sp. pl. 545, 1762.


Flowering & Fruiting: August-December.

Commonly found near villages.

Athar 667, Kherki Village.


Poinciana pulcherrima Linn. sp. pl. 380, 1753.

A large erect shrub, spiny, spines curved; branches with lenticels. Leaves bipinnate; pinnae 5-9; leaflets 6-12. Flowers in erect large racemes, red, blotched with yellow. Petals 5, clawed, odd petal smaller and unexpanded; the sepal facing it is boat-shaped. Stamens 10; filaments filiform, red.
Flowering & Fruiting: Late April-January.

Cultivated. Often found in public parks, government colonies.

Athen 537, Engineers' Hostel.

3. *Cassia* Linn.

Key to species:

Trees.

Flowers yellow.

Pod cylindric, filled with gummy substance .......................... 1. *C. fistula*

Pod flat ........................................ 2. *C. siamea*

Flowers pink; pod cylindric; filaments swollen near the middle ................ 3. *C. nodosa*

Herbs.

 Erect.

Leaves obviate; glands between two
lower pairs of leaflets .............. 4. *C. tora*

Leaves oblong-lanceolate; glands near the base of petiole ................. 5. *C. sephera*

Prostrate; leaflets small, 10-20 pairs
(in upper leaves); stamens 10 ........... 6. *C. kleinii*


A medium sized tree, bark grey. Leaflets 4-8 pairs, ovate, acute, glabrous when mature. Flowers large, sulphur-yellow in drooping lax
racemes. Pedical long. The gynoeicum protruding out of the flower.
Pod dark-brown, solid, cylindric, filled with brown, gummy substance.

Flowering & Fruiting: March-August.

Common. Cultivated in parks, gardens and on road sides.

Athar 560, Officers' Colony, Bijnor.


Cassia florida Vahl Bedd. Fl. Sylv. t. 179.

A medium sized tree. Differs from C. fistula in having elliptic-oblong leaves, which are sharply mucronate and flat pod, thickened at sutures.

Flowering & Fruiting: August-Sept.

Rare. Planted at some places in private gardens.

Athar 567, Sanjay Farm.


Cassia nodosa Hamilton Kurz. i. Fl. 1:1392; Night Ic. t. 410.

A large tree with spreading crown. Leaflets 5-12 pairs, elliptic, oblong, acuminate. Flowers showy pink, racemes from the scars of fallen leaves. Pod cylindrical, long.

Flowering & Fruiting: April-November.

Rare, Planted in private gardens.
Athar 535, R.J.V. Inter College.


Erect fociid annual. Leaves imparipinnate, glands between two lower pairs, gland yellow linear and leaning towards the end of rachis; leaflets 2–3 pairs, lower smaller, upper bigger, obovate, obtuse, nearly sessile. Flowers 5–8 in a raceme, pedicellate, yellow. Pod straight or slightly curved.

Plants associated: *Crotalaria medicaginea*, *Hyshochis minima*, *Bidens pilosa* var. *B. minor*, *Synoglosum* sp. etc.

Flowering & Fruiting: End of June–November.

Abundant, very common in waste lands, on road sides and edges of agricultural fields.

Athar 635, Jain ram, Bijnor.


**Senna esculenta** Roxb. F. Ind. 2:346, 1832.

This taxon differs from *C. tara* in having a gland just above the thickened base of petiole, acute, acuminate leaves, larger racemes.

Flowering & Fruiting: July–November.
Abundant, on roadsides, waste-lands and edges of agricultural fields.

Athar 685, R.C.I. Godown premises.


A prostrate or ascending herb, suffruticose. Leaf rachis with a stalked gland between lower pair of leaflets. Leaflets 10-20 pairs. Flowers 2-4 in the axil of the leaves. Stamens 10, longer and shorter alternating each other. Pod elongated, flat, slightly curved. Seed 10-17.

Plants associated: Hibiscus lobatus, Sida sp., Lescurum orientale, Castellaria mollissima, Agoratum conyzoides, Parthenium hysterophorum, etc.

Flowering & Fruiting: July-December.

Common, found in shady and moist situations.

Athar 2, Vardhman H.S. College Compound, Bijnor.

4. Peltophorum Vogel.


Inga pterocarpa DC. Prod. 2:447, 1825.


A large unarmed tree. Leaves bipinnate, dark green. Flowers large, shining yellow in erect ferruginous racemes. Petals with ferruginous
hair on back. Pod flat, indescent, winged.

Flowering & Fruiting: August-April.

Recently introduced in the area.

Athen 971, J.B. Sugar Hill.

5. Bauhinia Linn.

Key to species:

Calyx 2 cleft; stamens 3-4 ....................... 1. B. purpurea
Calyx spatheaceous; stamens 5 ..................... 2. B. variegata

1. Bauhinia purpurea Linn. Sp. pl. 375, 1753; Jull. 2:234, 1878;

A small tree. Leaves suborbicular, cleft nearly half way down from the apex. Flowers deep pink or white. Calyx tube cleft into two reflexed segments.

Flowering & Fruiting: February-July.

Commonly planted in gardens and parks.

Athen 452, Officers' Colony.

2. Bauhinia variegata Linn. Sp. pl. 375, 1753; Jull. 2:234, 1878;
Blatt. and Hill. Beaut. Ind. Tr. 3, t. 1, 1937; de et. in

A medium sized tree. Leaves deeply lobed, broadly cordate, 11-15 nerved. Flowers in short axillary corymbae, odd petal red, others
white, with pink veins, fragrant.

Flowering & Fruiting: February-June.

Common, planted for the sake of beautiful flowers and the buds (floral) which are cooked.

Ather 540, Vardhman F.G. College.

6. Saraca Linn.


Joncasia asoca (D. ex. As., Bos. 4:369, 1799.

Saraca indica (aut. nov. Linn. Foli. 2:271, 1776.


Flowering & Fruiting: March-May.

Rare. There is only one tree at Jain Farms.

Ather 542, Jain Farms.

7. Delonix Raf.


A medium sized to large tree with a large, spreading umbrella shaped
crown. Leaves bipinnate, leaflets oval oblong. Flowers in large, branched racemes. Petals 5, the odd petal yellowish-white with red blotches, others orange red. Stamens 10, filaments hairy at the base, reddish in upper half. Pod flat with partitions between the seeds, 15-40 seeded.

Flowering & Fruiting: March–February.

Common. Planted in gardens and parks.

Ather 599, Bijnor Inter College, Bijnor.

9. **Tamarindus** Linn.

*Tamarindus indica* Linn. Sp. pl. 34, 1753; ill. 21273, 1878; ill. 1:277, Rep. ed. 1900; Ill. 75, 1970.


Flowering & Fruiting: April–December.

Common. Planted for shade and fruits.

Ather 636, Chah Shirin.
XXXIX- MIMOSACEAE

Key to genera:

Stamens definite.

Pods jointed; flowers pink-purple;
stamens as many as or twice the
number of petals .................................... 1. *Mimosa*
Pods strap shaped, not jointed;
flowers creamy-white, stamens 10 .......... 2. *Leucaena*

Stamens indefinite.

Filaments connate.

Pods straight; unarmed trees;
flowers fragrant ...................... 3. *Albizia*
Pods torulose; armed shrubs
or small trees; flowers not
fragrant ............................................. 4. *Pithecellobium*

Filaments free; flowers in globose
heads or cylindrical spikes ............. 5. *Acacia*


Key to species:

Small herbs; stamens 4 ...................... 1. *M. pudica*
A large shrub or small tree; stamens 8;
pinnae 5-12 pairs; pod without bristly
sutures ............................................ 2. *M. intisa*


Flowering & Fruiting: August-February.

Occasionally found near villages (perhaps an escape) and cultivated as an ornamental.

Ather 200, Bijnor.


A large erect spinous shrub or small tree. Stem red. Leaves bipinnate, pinnae 5-12 pairs; leaflets 10-20 pairs, sharply bristled. Flowers in axillary peduncled heads or in terminal panicles, pink, 4-merous. Pods 6-10 jointed, sutures smooth. Seeds similar to *Hibiscus pudica*.

Flowering & Fruiting: July-October.

Often found on the bank of Ganga.

Ather 605, Rudi Ghat.

2. *Leucasena Benth.*

Mimosa leucophala Lamk. Encycl. 1:12, 1783.


A soft wooded, small tree, with large 2-pinnate leaves; pinnae 6-7 pairs; leaflets 14-17 pairs, linear acute and finely downy, a prominent sessile gland present between the lowest pair of pinnae; main rachis as well as secondary rachis end into a bristle; branches particularly younger parts tubercled. Peduncles axillary, solitary or paired, almost equalling the petiole. Flowers in globose heads. Corolla petals 5, greenish-white in colour. Stamens twice the length of corolla; anthers versatile. Style smaller than the filaments. Pod flat, strap shaped, in umbellate clusters, with a small beak, many seeded.

Flowering & Fruiting: July-February.

Commonly found in the area.

Atha 188, irithipur.

3. Albinia Dur.


A large deciduous tree. Crown globular, spreading. Bark dark-brown, rough, irregularly fissured. Leaves 2-pinnate; pinnae 2-5 pairs; leaflets 5-10 pairs, obliquely oblong. Flowers in 20-30 flowered heads which are either in axillary clusters or terminal racemes,
very fragrant particularly at night. **Sepals 5,** connate. **Petals 5,** connate. **Stamens** numerous; filaments nearly 4-7 times as long as the corolla, green above. **Peda** strap shaped, broad, straw coloured, long axis of the seeds at right angle to the long axis of the ped. **Seeds** compressed, elliptic-ovate, dark-brown.

**Flowering:** March—early May; Late February—March.

**Fruiting:** The flowers of second flush only, set fruits.

Commonly planted in the area.

*Athar* 620, Jain Farms.


A medium sized tree, sometimes with shrubby habit. Branches pendent with short stipular spines. **Leaves** bipinnate; leaflets elliptic-ovate, obliquely falcate. **Flowers** in globose heads forming long drooping, panicked racemes, yellowish-white. **Stamens** 40-50; filaments connate in the lower part. **Peda** spirally twisted, 5-11 seeded. **Seeds** dark-brown to black, arillate, flat, polished, embedded in spongy pulp.

**Flowering & Fruiting:** November—June.

Commonly found in the area, the pods are very fondly eaten by the children as the pulp is sweet.
Ather 621, Bijnor.

3. *Acacia* Mill.

Key to species:

Flowers in cylindrical spikes.

- Petiole flattened into a phyllode;
  - leaves caducous; pod much twisted;
  - unarmed tree ........................................ 1. *A. auriculiformis*

- Petiole not flattened; pinnae 10–20 pairs; pod straight, flat, armed
  - tree .................................................. 2. *A. catechu*

Flowers in heads.

- Pod cylindric; seeds 2-seriate ............ 3. *A. carneaiana*
  - Pod moniliform; seeds 1-seriate .......... 4. *A. nilotica*
    - subsp. tomentosa


A large tree with a straight trunk. Branchlets drooping. Leaves none; petiole flattened into a falcate, parallel veined phyllode. Leaves present in very young stage. Flowers in axillary, cylindrical spikes, bright-yellow, 5-merous. Pods spirally twisted, 5–10 seeded.

Flowering & Fruiting: September–April.

Planted at many places by Department of Social Forestry.

Ather 195, Vidurkuti Road.

*Mimoso catechu* Linn. f. Suppl. 439, 1781.


Flowering & Fruiting: May-February.

Often found near villages, also planted as ornamental.

Athar 593, Jalalpur.


A small tree. Bark brown, smooth. Leaves bipinnate; pinnae 2-8 pairs, spines stipular, straight, whitish, nearly 1/4 to 1/2 the length of pinnae. Flowers bright-yellow, fragrant. Pods cylindric.

Seeds in two rows.

Flowering & Fruiting: November-June.

Not uncommon in the area.

Athar 597, Barage road.

**Acacia nilotica** (Linn.) Del. var. tomentosa (Benth.) Hill in Bot. Mus. Leaff. Harvard Univ. 8:98, 1940.

**Acacia arabica** (Lamk.) Willd. var. tomentosa Benth. in Hook. Jour. Bot. 1:500, 1842.

**Acacia arabica** auct. (non Willd.); FBL. 2:293, 1878; FUGP. 1:286; Repr. ed. 1960.


Flowering & Fruiting: August–February.

Common in the area.

Athar 772, Railway Station.
XL- ROSEACEAE

Key to genera:

Erect or climbing shrubs.

Petals usually several; thorns curved ...... 1. Rosa

Petals 5.

Leaves and inflorescence usually glabrous.

Fruits minutely hispade, with a single lateral furrow running from apex to base; stone single with minute holes and sharp edges .......................... 2. Prunus

Fruits quite glabrous, gland dotted, pyriform, no furrow; seeds more than two, small and smooth ...................... 3. Pyrus

Leaves (abaxially) and inflorescence densely tomentose; fruit ovate-obovoid, skin thin, yellow to orange; stone often 1, rarely 2, smooth, dark brown .......................... 4. Erichetys

Prostrate herbs; leaves compound; flowers small, yellow ........................................ 5. Potentilla

1. Rosa Linn.

Several varieties of roses belonging to various species e.g. Rosa multiflora Thumb. and R. banksiae L.B. are grown in gardens.
Prunus persica (Linn.,) Stokes
2. Prunus Linn.


**Amygdalus persica** Linn. Sp. Pl. 472, 1753.

Extensively grown for the sake of the fruits, locally called as "Aru".

Flowering & Fruiting: March-June.

Athar 726, Jain Farms.

3. Pyrus Linn.


**Pyrus sinensis** Hort. (non Linn.).

A common fruit tree. Fruits are locally known as "Nashpati".

Flowering & Fruiting: April-October.

Athar 769, Mandawar.

4. Eriobotrya Lindl.


**Neosipilus japonicus** Thumb. Fl. Jap. 206, 1784.

Seldom grown in gardens for the sake of fruits locally called as "Laquat".

Flowering & Fruiting: Summer season.

Athar 545, Jain Farms.
5. *Potentilla* Linn.


Annual prostrate herb. Stem branches many radiating from a central point, tinged with very light red, hairy. Leaves 3-5 foliate; leaflets subsessile, opposite or alternate, obovate, oblong or cuneate, obtuse, lobulate or serrate, the base may be equal or unequal; stipules ovate entire and hairy. Flowers on slender axillary pedicels, the pedicels elongate as the fruit matures. Petals oblong, smaller than the sepals, yellow. Stamens numerous, inserted on the calyx tube; filaments short; anthers yellow. Carpels several, free, style sub-terminal.

Flowering & Fruiting: Late winter.

Often found in moist, shady and cool localities.

Ahar 51, Near Saidi.
XLI. COMBRETACEAE

Key to genera:

Trees; flowers in spikes; petals none .......... 1. Terminalia

Climbers; flowers in pendulous corymbs;
petals 5, white, turning to pink .................. 2. Quisqualis

1. Terminalia Linn.

Key to species:

Flowers all bisexual.

Fruits 5-7 winged, coriaceous ................. 1. T. arjuna

Fruits 5-ribbed, drupaceous ..................... 2. T. chebula

Flowers not all bisexual; terminal
ones, in the spikes, staminate .................. 3. T. bellerica


Pentapeta glabra Roxb. Fl. Ind. 2:440, 1832.


A medium sized tree. Bark light-grey, smooth, peeling off in thin flakes. Leaves ovate-lanceolate, cordate at the base, two or sometimes one gland present near the base of leaf. Flowers greenish-
yellow, in terminal and axillary, pendulous spikes; bracts linear. Calyx tube longer than the bracts, 5-lobed, with an orange disk at the throat of tube, hairy. Petals 0. Stamens 10, subequal, exerted. Fruit resembling that of carambola, 5-winged, coriaceous, dark brown, fibrous.

Flowering & Fruiting: April–July. The fruits remain on the tree till next flowering.

Planted on road sides by Department of Social Forestry.

Athin 556, Mizaffar Nagar, Road.


A medium sized tree, deciduous. Bark thick, dark-brown. Leaves simple, sub-opposite, ovate-oblong, acute, short-petioled; petiole with two glands near its apex, tomentose when young. Flowers dull-white in terminal or subterminal panicked spikes. Fruit an ellipsoid, 5-ribbed drupe, blackish-brown.

Flowering & Fruiting: April–March.

Often found near villages.

Athin 646, Baiga Dala.


Myrobalanus bellerica Gaertn. Fruct. 2:90, t. 97, 1790.

This species can be readily distinguished from other species of
Terminalia by its long petioled leaves; footed smelling flowers and grey-velvety drupaceous fruits.

Flowering & Fruiting: Summer and cold season.

Commonly planted on road sides.

Athal 365, Najibabad Road.

2. *Quisqualis* Linn.


A large climber, stem yellowish-brown. Leaves subsessile, opposite, superposed. Flowers in terminal pendulous large corymbs, sessile, initially white then turning pink-red, emitting sweet fragrance at night. Calyx tube long, lobes 5, reflexed. Petals attached at the mouth of calyx tube. Stamens filaments long, inserted on unequal heights.

Flowering: April–November.

Commonly planted in parks and private gardens, often found as an escape.
Key to genera:

Fruit a capsule.

Leaves puberulous at least abaxially;
flowers sessile in pendulous cylindrical
spikes; filaments brightly coloured ....... 1. Callistemon
Leaves glabrous; flowers pedicelled,
in dichotomous axillary or terminal
cymes; filaments not coloured ............. 2. Eucalyptus

Fruit a berry.

Berry with numerous seeds; yellow or
greenish-yellow when ripe; persistent
calyx bifid .................................... 3. Psidium
Berry single seeded; purple coloured,
persistent calyx cupular ...................... 4. Syzygium

1. Callistemon R.Br.

Callistemon citrinus (Curt.) Skeels (1913); Baecker & Bakh. f. Fl.


Callistemon lanceolatus DC. Prodr. 3:233, 1828.

A small tree with straight trunk and rough bark. Branches, specially
younger ones, reddish and pubescent. Leaves shortly pedicled,
sericeous, puberulous at least abaxially, entire, sharply pointed
at apex; lateral nerves obscure. Flowers in compact, cylindrical
and drooping spikes. Calyx tube campanulate, gland dotted. Stamens
numerous, exerted, filaments quite long, red, shortly connate at base. Fruit sessile, globose, capsule. Seeds numerous, light-brown.

Though, in this plant, the apical extension of the branch terminates after the development of inflorescence, but due to the sympodial growth of lateral bud it looks as if the apex of the inflorescence were growing vegetatively.

Flowering & Fruiting: February-May.

Planted in gardens and parks.

Athar 710, Bijnor.

2. Eucalyptus L'Herit

Key to species:

Flowers in 3-flowered umbels, combined into panicles; operculum hemisphoric ........... 1. E. citriodora

Flowers in 5-12 flowered umbels;

operculum conical ________________________________ 2. E. tereticornis


A tall, 20-40 m high tree. Bark smooth, ashy-grey, exfoliating annually in long flakes. Flowers in 3-flowered umbels, combined into short panicles, petals connate, double, calyptrate; inner one semi- orbicular, translucent, with radial faint streaks, apex often pointed. Fruit a globose–ureeolate capsule.

Flowering & Fruiting: November-April.

Often planted in the area in gardens or as avenue tree.
Atha 611, Bijnor.


May be distinguished from preceding species by umbellata 9-15 flowered inflorescence and conical operculum.

This species is of tremendous commercial value. Planted on commercial scale because of its fast growth.

Atha 612, Prithipur.


Small tree. Stem single or sometimes many from near the base. Bark pale-brown, smooth, exfoliating in thin flakes. Branches 4-angled when young, later nearly terete. Leaves elliptic-oblong, close set, obtuse, entire, lateral nerves running parallel to each other. Flowers on 1-3 flowered axillary peduncles. Petals white. Stamens numerous; filaments filiform. Fruit globose or pyriform, smooth or with uneven surface; pulp white or pink-red depending on the variety.

Flowering: May–June; September–October.
Fruiting: August-September; December-January.
Extensively cultivated in houses and orchards.

Athar 625, Bijnor.


*Syzygium jambolanum* DC. Prodr. 3:239, 1828.

A medium-sized tree. Dark light-grey to brown. Leaves distant, broadly oval or obovate, petioled, upper surface shining. Flowers in 3-chotomous cymes, combined into pendulous panicles. Petals 5, calyptrate, creamy-white. Stamens numerous; anthers gland tipped. Fruit usually an ellipsoid berry, deep-purple to black when ripe, single seeded.

Flowering & Fruiting: April-July.

Mostly planted on road sides.

Athar 647, Najibabad Road.
Key to genera:

Trees or shrubs.

Calyx tube short, not curved.

Bruised leaves dye the skin red;

stamens usually 8 or sometimes 4 ........ 1. Lawsonia

Bruised leaves do not stain the

skin red; stamens numerous ............... 2. Lagerstroemia

Calyx tube elongated, curved; leaves

with red glands on abaxial surface ....... 3. Woodfordia

Herbs, usually growing in damp localities .... 4. Anmanna

1. Lawsonia Linn.

Lawsonia inermis Linn. Sp. Pl. 349, 1753; Kochne in Bot. Jhabr. 4:

36, 1883; Santapau in Rec. Bot. Surv. Ind. 16(1):100, 1967; FPP.


Lawsonia alba Linn. Encycl. 3:106, 1789; FBD. 2:573, 1875; FUGP. 1:


A large shrub, sometimes dwarfed due to periodic trimming. Branchlets

often ending into a spine. Leaves small, lanceolate, nearly sessile.

Flowers fragrant, white in large terminal panicles. Calyx 4-lobed.

Petals 4, free. Stamens 8. Capsule globose enclosed in persistent

calyx.

Flowering & Fruiting: March–October.

Often planted in houses for the sake of leaves, which are much valued
by women to dye their palms and soles, also makes a good hedge when properly trimmed.

Ather 553, Bijnor.

2. Lagerstroemia Linn.

Key to species:

Trees; leaves acute, with both halves equal; calyx accrescent and becomes woody in the fruit ......................... 1. L. speciosa

Shrubs; leaves obtuse, with both halves slightly unequal; calyx neither accrescent nor woody in the fruit ......................... 2. L. indica


Muenchhausen speciosa Linn. ex Murray, Prodr. Stirp. Gotting t. 2, 1770.


Flowering & Fruiting: June-October.

Recently introduced in the area by the Department of Social Forestry and planted on road sides at several places.

Ather 554, Muzaffar Nagar Road.

A dark-green, attractive shrub. Leaves smaller than the L. speciosa, obtuse, glabrous, both the halves slightly unequal. Flowers in terminal panicles, white or pink. Calyx 6-lobed; lobes acute, erect. Petals long-clawed, margins shortly fimbriate. Stamens numerous; outer longer and incurved. Style bent, degree of curvature variable. Capsule not woody.

Flowering & Fruiting: April-November.

Often planted in Gardens and public parks.

Ather 643, Bajaz Ali Hall, Bijnor.

3. Woodfordia Galisb.


Flowering & Fruiting: May-August.
Rare, some times found on the walls of old buildings.
Plants associated: *Lindernbergia indica*, *Scirpus conicus* etc.
*Ather 284*, Mandawar.
4. *Amannia* Linn.

Key to species:
Leaves broadened at the base; flowers distinctly pedicelled.
Leaves upto 5.0 cm long; inflorescence not more than 1/4 of the length of leaf; fruit about 0.3 cm in diameter ...... 1. *A. senegalensis*
Leaves upto 3.5 cm long, inflorescence upto 1/2 of the length of leaf, fruit about 0.1 cm in diameter ................. 2. *A. multiflora*
Leaves narrowed at the base, flowers subsessile .................


*Nair (1978) has considered *A. auriculata* Willd. (1806) as correct name for this taxon and *A. senegalensis* as a synonym. It may be pointed out here, that *A. senegalensis* Lank. (1791) is an earlier published name and should be given priority over the combination *A. auriculata* Willd.*
An erect annual herb, branching from above the base. Leaves sessile, broadened and auricled at the base, entire, acute; secondary nerves not much prominent. Flowers in dichotomously branched axillary clusters, bracteate. Calyx campanulate, with 6-8 green lines, against the observation of Duthie these lines are quite distinct in fruit as well. Fruit not more than 10 in an axil, globose, red; exceeding the calyx.

Flowering & Fruiting: September-November.

Abundant in marshy places.

Ather 348, Hazaffar Nagar Road.


This species, according to Duthie, is hardly distinguishable from *A. senegalensis*, but in my opinion following two points can be used to distinguish these two taxa from each other.

1. The length of the axillary clusters is never more than 1/4 of the corresponding leaf in case of *A. senegalensis* and it may reach up to more than 1/2 of the leaf length in case of *A. multiflora* Roxb.

2. Number of fruits in a cluster is not more than 10 in case of *A. senegalensis*, while it is never less than 15 in *A. multiflora*.

Flowering & Fruiting: September-November.

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*As observed in the material collected from Bijnor.*
Occasionally found in rice fields and near the edges of sugarcane fields.

Ather 172, Hemrajpur.


Lect, annual herb, branching from near the base, the branches may be ascending. Leaves sessile, oblong-lanceolate to obovate, narrowed towards the base, acute or obtuse at the apex. Flowers subsessile in axillary clusters. Petals none. Fruit a depressed, globose capsule.

Flowering & Fruiting: September-December.

Abundant in marshy places.

Ather 684, Mandawar.
XLIV- PUNICACEAE

**Punica Linn.**


Much branched shrub or tree, often spiny. Leaves oblong-lanceolate, entire, glabrous. Flowers solitary or in clusters of 2-5. Calyx 6-9 lobed in upper part, lobes triangular, thick. Petals 6-9 free, crumpled, brick-red or orange. Stamens numerous. Ovary 6-12 celled, ovules numerous. Fruit globose berry, rind coriaceous. Seeds obtusangular, outer layer juicy.

Flowering & Fruiting: April-November.

Cultivated as fruit tree in orchards and private gardens. Two distinct forms, one with red juice and other with white juice, are met with.

Athar, 722, Bijnor.
XLV. ONAGRACEAE

Key to genera:

Flowers yellow.

Leaves, both upper and lower, lyrate ..... 1. Genesira
Leaves entire ............................. 2. Ludwigia

Flowers rose-pink.

Plants with glandular and simple hairs
both; calyx tube not produced beyond
the ovary ................................. 3. Epilobium

Plants with simple hair only; calyx
tube much produced beyond the ovary ..... 1. Genesira

1. Genesira Linn.

Key to species:

Leaves lyrato, flowers yellow .................. 1. O. sinuata
Leaves entire, flowers rose-pink ............... 2. O. rosea

Res. 6(2):99-100, 1984.

Erect or ascending herb, stem somewhat woody at base, terete,
puberulous, tinged with pink. Leaves obovate, lyrate, apex and
margins slightly ciliate, veins with few hairs, younger parts and
flowers comparatively densely hairy. Flowers solitary, axillary,
sepallte. Calyx tube nearly 2 cm produced beyond the ovary, densely
hairy, apex red. Corolla shorter than the calyx; petals orbicular

*New record for India.
Cenothera sinuata Linn.
with a narrow base, yellow. Stigma four lobed. Capsule clavate, pubescent with four apical teeth, four angled.

Flowering & Fruiting: March-April.

Rare, collected only once from a sugarcane field.

Ather 234, Vidur Kuti Road.


This species can be readily distinguished from the former by nearly entire, lanceolate leaves (in my specimen there are no lyrate basal leaves); flowers with a longer pedicel and pink in colour.

Flowering & Fruiting: Later part of cold season.

Occasionally grows on the dry bed of the Ganga.

Ather 227, Madhya Ganga Barrage.

2. *Ludwigia* Linn.

Key to species:

Hydrophytes with white, spongy

floats; stamens 10 ......................... 1. *L. descendsens*

Terrestrial or marshy herbs.

Glabrous, stamens 4 .......................... 2. *L. perennis*

Villous, stamens 8 .......................... 3. *L. octovalvis*

var. *sessiliflora*

**Ludwigia adscendens** Linn. Mant. Pl. 1:69, 1767.


A glabrous floating herb with white, spongy floats arising from the nodes. **Leaves** obovate, entire, apex rounded, base narrowed into petiole. **Flowers** yellow, pedicelled. **Petals** 5, obovate. **Stamens** 10 in two whorls. **Style** 1. **Stigma** capitate. **Capsule** cylindric, reflexed during ripening under water. **Seeds** reticulate.

**Flowering & Fruiting:** August–December.

**Found in and near the edges of ponds and road side ditches.**

Ahar 56, Bansoorpur.


**Ludwigia perennis** (Linn.) Brenan in Kew Bull. 163, 1953; Fl. Delhi 164, 1963.

A glabrous annual herb. Main stem erect, branches decumbent or ascending. **Leaves** simple, linear-lanceolate, entire. **Flowers** small, yellow. **Sepals** 4, connate; calyx lobes ovate. **Petals** 4, equal to the sepals. **Stamens** 4. **Style** 1. **Stigma** capitate. **Fruit** obtusely
quadrangular, linear-oblong, crowned by persistent calyx lobes.

Flowering & Fruiting: August-November.

Often found in moist and shady places.

Ather 173, Near Rawdi.

3. **Ludwigia octovalvis** (Jacq.) Raven, Kew Bull. 15:476, 1962;


**Jussiaea suffruticosa** Linn. Sp. Pl. 388, 1753; FDI. 2:587, 1869;

An erect, suffruticoso, hairy herb. Leaves lanceolate, shortly
pottiode. Flowers solitary-axillary, yellow, subsclessile. Sepals 4,
connate, lobes enlarging in fruit. Petals 4, orbicular, pale-yellow.
Stamens 8 (rarely fewer). Fruit a hairy, narrowly cylindric capsule,
crowned with persistent sepals.

Flowering & Fruiting: October-February.

Abundant in agricultural fields.

Ather 81, Near Mezan Shah Mohammed.

3. **Epilobium** Linn.

**Epilobium hirsutum** Linn. Sp. Pl. 347, 1753; DC. Prodr. 3:142, 1828;
   Clarke in HK. f. FDI. 2:588, 1879; Murty & Singh in Sci. and Cult.

A much branched herb, up to 1 m high. Stem terete, hairy with both

Flowering & Fruiting: November-January.

Rare, collected only once from a drying ditch.

Ather 173, Near Bijnor Inter College, Bijnor.
Trapa Linn.


Annual, floating, hydrophytes. Leaves long petiolated, dimorphic, submersed leaves, dissected while the floating ones are rhomboid-ovate, dentate in upper half; upper surface dark-green, glabrous; lower surface purple, pubescent. Flowers solitary, white, pedicels short, thick, spongy. Sepals 4, connate, 2-enlarged and spinescent in fruit. Petals 4, free, connate on margins. Stamens 4. Carpels 2, connate. Style 1, filiform, stigma capitate. Fruit a drupe with two lateral sharp spines; pulp white, sweetish when young and tasteless when mature.

Flowering & Fruiting: October-January.

Extensively cultivated in ponds.

Ather 569, Faida.
XLVII- CUCURBITACEAE

Key to genera:

Flowers white.

Petal fimbriate .................................. 1. \textit{Irisheseranthes}

Petal not fimbriate.

A softly hairy climber with a
disagreeable smell; fruit bottle
shaped or globose, light-green;
brown and hard when ripe ............. 2. \textit{Legenaria}

A nearly glabrous climber with
woody root stock; fruit oblong;
red and fleshy when ripe ............. 3. \textit{Coccinia}

Flowers yellow or yellow-orange.

Fruit globular.

Pulp white.

Fruit solid through out ............. 4. \textit{Benincasa}

Fruit (ripe) with a semisolid
mass in the central cavity
wherein the seeds remain
embedded ................................. 5. \textit{Cucumis}

Pulp coloured.

Fruit very small, not more
than a pea, red when ripe ........... 6. \textit{Mukia}

Fruit large.

Pulp spongy (in ripe fruit),
pink-red; no central cavity .... 7. \textit{Citullus}
Pulp not spongy; fruit
with a central cavity.
   The cavity (in ripe
fruit) filled with
   a semisolid mass
   wherein the seeds
   remain embedded ..........  5. Cucumis
   The cavity (in ripe
fruit) empty; seeds
   remain stuck to fruit
   wall ........................  6. Cucurbita

Fruit not globular.
   Fruit fusiform with prominent ridges
   running from pedicel end to stylar
   end, tubercled between them; many
   of mature seeds denticulate ............ 9. Bombardica

Fruit cylindrical, nearly smooth.
   Mature seeds white ............... 5. Cucumis
   Mature seeds black ............... 10. Luffa

1. Trichesanthe Linn.

Key to species:

Fruit long, white stripped, some-
times curved ................................. 1. I. anguina
Fruit short, tapering on both the
ends ........................................... 2. I. dicea

Commonly cultivated for the sake of fruits, locally called as "Chachenda".

**Flowering & Fruiting**: Rainy season.

**Ather**: 164, Khari.


Cultivated for its fruits locally called as "Parwal".

**Flowering & Fruiting**: April–November.

*Trichosanthes cucumerina* Linn. is found among the hedges.

2. **Lagenaria Soringe**


*Cucurbita lagenaria* Linn. Sp. ci. 1010, 1753.


An important vegetable crop, grown for the sake of fruits locally known as 'Kaddu' or 'Lauki'. Two forms are under cultivation one bears cylindrical fruits while other bears globose fruits.

**Flowering & Fruiting**: Rainy season.

**Ather**: 567, Bijnor.
3. **Coccinia** Wt. & Arn.

*Coccinia grandis* (Linn.) Voigt, Hort. Suburb. Calc. 59, 1845;

*Bryonia grandis* Linn. Lant. Pl. 1:126, 1767.


*Coccinia cordifolia* auct. pl. (non *Bryonia cordifolia* Linn. 1753);


A very extensive climber; young branches green, smooth, older rough.
*Corolla* white with greenish veins. *Female flowers* solitary. *Calyx tube* campanulate. *Fruit* oblong, green with white spots when raw and beautiful red-scarlet when ripe.

**Flowering & Fruiting:** March-December.

Commonly found climbing on other trees, bushes and electric poles.
This plant, sometimes, proves quite harmful to the trees and bushes it climbs on, as it forms a dense covering over them and hinders their growth by cutting off the light. Its eradication also is difficult because of subterranean root stock.

Ather 231, Jhalu.
4. **Benincasa Savi**


**Cucurbita hispida** Thumb. Fl. Jap. 332, 1784.

**Benincasa serifera** Savi, Biblioth. Ital. 9:156, t. c, 1819; FBL. 2:616, 1879.

Cultivated for the sake of its fruits locally known as "Petha". The fruits are used in confectionery. Also used as vegetable.

Flowering & Fruiting: Rainy season.

Atha 771, Pedi.

5. **Cucumis** Linn.

Key to species:

Fruit depressed globose, texture and colour varying according to the variety; central cavity filled with a semisolid mass, wherein the seeds remain embedded ........ 1. **C. melo** var. **melo**

Fruit cylindrical, without any cavity and semisolid mass.

Fruit elongated (upto 60 cm), straight or curved, downy, skin very thin .................. 2. **C. melo** var. **utilissimus**

Fruit short (not more than 30 cm), broad, curvature none or slight, quite glabrous; skin thick .............. 3. **C. sativus**
Cultivated on the dried bed of rivers and canals during summer months as an important commercial crop. The fruits locally called, "Kharbooza" exhibit a vast range of skin colour, texture and taste of pulp.
Flowering & Fruiting: May-July.
Athen 392, Nawali Chat.

Locally called as, "Kakri" and eaten both raw and as vegetable.
Flowering & Fruiting: March-June.
Athen 393, Dandawar.

Fruits locally called as, "Kheera" are eaten both as vegetable and raw.
Flowering & Fruiting: May-October.
Athen 798, Jalalpur.


*Cuscuta maderaspata* Linn. Sp. Pl. 1012, 1753.

*Bryonia scabrella* Linn. f. Suppl. Pl. 424, 1781.


Flowering & Fruiting: August-November.

Abundant among hedges and bushes.

Athan 10, Mandawar Road.


**Cucurbita citrullus** Linn. Sp. Pl. 1010, 1753.


Cultivated for the sake of its fruits locally called as "Sitaphal" or "Lal Phal Ka Kaddu".

**Flowering & Fruiting:** Rainy and winter seasons.

**Athan 602,** Mirzapur.


Extensively cultivated for the sake of fruits, locally called as "Karela".

Flowering & Fruiting: June–November.

Ather 385, Mandawar.


Key to species:

Stamens 5; fruit smooth ------------------------- 1. *L. egypptiaca*

Stamens 3; fruit with 10-ridges ------------------ 2. *L. acutangula*


Cultivated for the sake of fruits locally known as "Ghiya-Tori".

Flowering & Fruiting: May–November.

Ather 610, Bijnor.

Cucumis acutangula Linn. Sp. Pl. 1011, 1753.

Cultivated for the sake of its fruits called as "Kali-Tori".

Flowering & Fruiting: July-December.

Athar 681, Bijnor.
Cassaria Jacq.

Cassaria tomentosa Roxb. Fl. Ind. 2:421, 1832; FBI. 2:593, 1879; 

A small tree with smooth ashy-grey bark and spreading branches. Old
branches hairy. Leaves leathery, glabrous above and softly pubescent
below; shortly petioloed. Flowers in axillary cymes on old branches,
shortly pedicelled. Sepals 5, hairy outside, obtuse, longer than
the petals. Petals narrow, linear, hairy upward, yellow, thick.
Stamens 8, filaments dilated below; anthers with few hairs, stam-
node present. Ovary hairy; style short; stigma capitate. Fruit not
seen.

Flowering: April.

Rare, only one tree could be located near R.J.P. Inter College,
Bijner.

Ather 249, Near R.J.P. Inter College, Bijner.
XLIX- CACTACEAE

Key to genera:

Stem flat.

**Flowers red, tubular; stamens exerted .... 1. **_Nopalea_

**Flowers yellow, expanded; stamens not exerted** ............................. 2. **Opuntia**

Stems ribbed; flowers white ......................... 3. **Cereus**

1. **Nopalea** Salm-Dyck


_Cactus cochenillifera_ Linn. Sp. Pl. 468, 1753.

Branches ascending, phylloclades oblong; spines none. **Leaves minute, caducous. Flowers borne in the upper part of the phylloclade, red, sessile. Stamens numerous, exerted, filaments red.**

Flowering: February-March.

Often cultivated in gardens.

Ather 642, G.I.A.O. Residene, Bijner.

2. **Opuntia** Mill.


A large shrub. Lower portion of the stem more or less cylindrical, young stem jointed, phylloclades obovate, fleshy, olive-green, flattened; areoles scattered; minutely tufted hairy, spines 1-8 per areole, terete, acicular, yellowish brown. Flowers yellow when young later developing red blotches. Fruit a pyriform berry, red when ripe.

Flowering & Fruiting: April–July.

Often found in patches in waste places. Frequently used for fencing purposes around orchards.

Athar 729, Near Dharam Nargi.

3. Cereus Mill.


An arborescent cactus with jointed, ribbed stems, ribs 5-6, spinous. Flowers white.

Flowering & Fruiting: Summer season.

Planted on the fences of the orchards.

Athar 709, Vidurkuti Road.
Passiflora Linn.


A medium sized climber with dense foliage. Leaves palmatisect in 3-5 lobes; lobes minutely serrate; petiole with 2-4 glands. Flowers solitary-axillary, fragrant. Sepals 5, white. Petals 5, bluish, rays of corona 2-4 seriate, purple at base, white in the middle and blue at the tip. Stamens 5, inserted on gynophore; anthers 2-lobed. Ovary 1-celled, 3-carpellary, placed on a gynophore. Styles 3; stigma capitate.

Flowering: May-October.

Often planted in parks, inspection houses and private gardens.

Ather 715, H.J.P. Inter College.
LI- CARICACEAE

Carica Linn.


Small lactiferous trees with mostly unbranched and straight stem; leaf scars prominent. Leaves in dense terminal crown, long petioled, petiole hollow; blade palmately 7-9 pinnatifid segments.

Staminate flowers in long drooping panicles; female subsessile in clusters of 2-3 or solitary. Petals 4-5 connate in male flowers, free or slightly connate in female flowers. Stamens 10, 2-seriate.

Ovary ellipsoid-ovoid, 1-celled with parietal placentation. Fruit a broadly ovoid, pyriform berry, green when young, yellowish-green on ripening; pulp orange, sweet. Seeds black, reticulately pitted.

Flowering & Fruiting: August-February.

Cultivated as commercial crop. Many varieties differing in plant height, fruit size and taste and number of seeds per fruit, are in cultivation.

Ather 766, Officers' Colony.
LIIL- MOLLUGINACEAE

Key to genera:

Leaves linear; carpels free .................. 1. Gleokia
Leaves lanceolate; carpels fused.

Flowers axillary; seeds with a
white filiform appendage .................. 2. Caimus
Flowers terminal; appendage
none or minute .......................... 3. Mallugo

1. Gleokia Linn.


A prostrate, deep-rooted, glabrous herb. Leaves sub-opposite, linear-oblong, subsessile. Flowers in axillary and terminal cymes, small, yellowish-green. Sepals 5, free, margins scarious, tips reflexed.

Petals 0. Stamens 5; filaments dilated at the base. Carpels 5, free, style short. Fruit of 5, free, densely papillose, indehiscent ceci.

Flowering & Fruiting: July-December.

Often found in sandy and dry soil.

Ather 780, Barrage Road.

2. Caimus Linn.

Key to species:

Plants densely stellately hairy; leaves
usually opposite; styles 5 ........................ 1. C. letaidea
Plants glabrous; leaves usually 3-5
in a whorl; styles 3-4

2. G. oppositifolius


Mollugo lotoides O. Kuntze, Rev. Gen. 264, 1891.


Profusely branched, densely stellately hairy, prostrate herb. Leaves
ovate-ovobo rated, stellately hairy on both surfaces. Flowers 3-5 in
axillary clusters, subsessile. Sepals 5, densely stellate hairy.
Petales 0. Stanen 5, free; filaments short initially, elongating
later. Ovary glabrous, thin walled, 5-celled; styles 5. Fruit 5
valved capsule, included in persistent calyx. Seeds many, reniform,
tubercled, shining, dark brown, with a long filiform appendage.

Flowering & Fruiting: March-September.

Often found in dried ditches.

Athar 547, Mandawar.


1960.

Mollugo specula Linn. Syst. 881, 1759; FBI. 2:652, 1879.

Flowering & Fruiting: February-August.

Often found in dried ditches and ponds.

Athar 562, Pedi.

3. Mallugo Linn.

Key to species:

Leaves whorled at the nodes ....................... 1. M. pentaphylla
Leaves radical only ................................ 2. M. nudicaulis

Mallugo pentaphylla var. stricta (Linn.) Hoehr. Candollea, 2:356, 1923.


Flowering & Fruiting: March-December.
Common in sugar-cane fields.

Ahtar 79, Najibabad Road.

Sivarajan (1983) studied general morphology and seed sculpturing of this taxon and concluded, "Linnaeus seems to have treated them rightly, as different species, and amendments to the prevailing concept of species in this complex are called for. We suggest that \textit{M. stricta} be reinstated as distinct from \textit{M. pentaphylla". In light of this treatment, my specimen should belong to \textit{M. stricta} Linn. However, because authentically identified specimens of both the species were not available to me, to match with, so I have adopted the prevailing treatment.


This species can be readily distinguished from the previous species by the presence of radical leaves.

Flowering & Fruiting: July–October.

Rare, collected only once from a sugarcane field on Najibabad road.

Ahtar 590, Najibabad Road.
Key to genera:

Ovary 2-celled; styles-2 and fruit
2-valved ........................................ 1. Zaleya

Ovary 1-celled, styles-1 and fruit
1-valved ........................................ 2. Trianthema

1. Zaleya Burm. f.


Plants associated: Portulaca oleracea, Vernonia cinerea, Desmodium sp., Staurogyne glutinosa, Hemigraphis hirta etc.

Flowering & Fruiting: July-December; February-June.

A very common weed. I have, usually, found this plant heavily infested by insects.

Athan 583, Prithipur.


2. Triantthema Linn.

Triantthema portulacastrum Linn. Sp. Pl. 223, 1753.


Triantthema obcordata Roxb. Fl. Ind. 2:i449.

Flowering & Fruiting: June–November.

Abundant. A common weed.

Athar 770, Mirdhan.
LIV- APIACEAE (UMBELLIFERAE nom. alt.)

Key to genera:

Flowers white, pinkish or purple.

Plants either creeper or stoloniferous.

Leaves orbicular or reniform.

Leaves lobate or partite;

mericarps 7-9 ribbed ............... 1. Centella

Leaves lobate or partite,

smaller; mericarps 3-ribbed ...... 2. Hydrocotyle

Leaves pinnately compound; plants

stoloniferous ......................... 3. Oenanthe

Plants erect or nearly so and without
rooting at nodes or stolons.

Roots conical, pink to purple,

edible ..................................... 4. Daucus

Roots normal.

Plants hispidly hairy; leaves
do not exhibit dimorphism

with age ............................. 5. Seseli

Plants quite glabrous; leaves
shallowly lobed before
flowering and decompound

after flowering ....................... 6. Coriandrum

Flowers yellow.

Fruits narrowly winged .................. 7. Anethum

Fruits ribbed ................................ 8. Foeniculum
1. **Centella Linn.**


Plants associated: *Zornia gibbosa, Limnophila chinensis, Hygrophila sp.*, *Polygonum sp.*, *Eriocaulon sp.*, *Carex sp.*

Flowering & Fruiting: November-April.

Commonly found in moist places. Grows equally successfully in loam and sandy soils.

Ather 239, along a nullah on barrage road.

2. **Hydrocotyle** Linn.


Oenanthe javanica (Bl.) DC.

Oenanthe javanica (BL.) DC.
A glabrous herb. Leaves smaller than those of Centella, cordate, lobed to or beyond the middle. Peduncles very short. Flowers pink. Fruits broader than long.

Flowering & Fruiting: February-October.

Rare, found in moist and shady situations.

Athar 564, Rawli Chat, Bijnor.

3. Cenanthe Linn.


A stoloniferous, glabrous herb, with fistular stem, off shoots ascending or erect. Leaves usually 1-pinnate; leaflets 3-5, serrate, acute, petiole long; umbels compound and terminal and/or leaf opposite. Flowers white. Fruits with swollen ribs.

Plants associated: Ranunculus cantenensis, Ipomea aquatica, Polygonum sp., Grapes maderaspataana, Eleocharis palustris.

Common, on the banks of river Ganges and other nullahs.

Flowering & Fruiting: January-May.

Athar 324, Barrage Road.

4. Daucus Linn.

Daucus carota Linn. Sp. Pl. 242, 1753; Hoxb. Fl. Ind. 2:90;
A hairy herb. Leaves 2-3 pinnate and looking as decomposed due to further divisions of pinnae. Root fleshy, conical, orange red to purple, edible, varies in size. Flowers white or pink with a dark centre, in compound umbels, outer ones zygomorphic.

5. *Seseli* Linn.


*Ligusticum diffusum* Roxb. ex Sm. In Reeve Cyclop. 21:1, 1912.


Plants associated: *Cichorium intybus*, *Hygrophila auriculata*, *Ammannia baccifera*, *Echinochloa crus-galli*.

Common, found on drying water logged soil.

Ather 337, Kherki.


*Coriandrum sativum* Linn. Sp. Pl. 256, 1753; FBI, 2:717, 1879; FUGP.
An erect glabrous annual. Leaves initial leaves palmatilobed-partite; subsequent leaves become more and more dissected, finally becoming decompound. Umbels terminal and axillary. Flowers purple, outer ones in the umbel sygomorphic the inner ones actinomorphic. Fruits with undulated primary ribs, greenish or yellow.

Flowering and Fruiting: Winter season.

Extensively cultivated for the sake of leaves and fruits.

Ather 631, Bijnor.

7. Anethum Linn.


A tall erect glabrous herb. Leaves upper sessile, lower petioled, otherwise all similar, decompound. Flowers yellow, all similar.

Flowering and Fruiting: Winter season.

Cultivated. Often found as an escape.

Ather 629, Ganj Road.

8. Foeniculum Mill.

Foeniculum vulgare Mill. Gard. Dict. ed. 8. no. 1, 1768; FBI. 2:695, 1879; Dw. Blumea 2:200, 1936; Fl. Males. Ser. 1. 4:136,
This plant differs from *Anethum graveolens* in having larger umbels and fruits which are ribbed.

Cultivated, rarely met with as an escape.

Ather 628, Jhalu.
LV. RUBIACEAE

Key to genera:

Small erect or prostrate herbs.

Ovule single in each locule.

Plants softly villous; flowers in elongating cymes ........................ 1. *Knedia*

Plants hispid; flowers in axillary sessile clusters .............. 2. *Bergeria*

Ovules numerous in each locule.

Calyx teeth long and contiguous in fruit ............................ 3. *Koehautia*

Calyx teeth short and distant in fruit .............................. 4. *Oldenlandia*

Large shrubs or trees.

Flowers in compact, globose, peduncled heads .................... 5. *Anthoccephalus*

Flowers not in compact heads.

One calyx lobe transformed into a yellow leaf .................. 6. *Mueckandra*

Calyx lobes all similar.

Leaves petiolate, wheel; flowers in terminal open, forking cymes .......................... 7. *Hamelia*

Leaves sessile, opposite; flowers in axillary dense corymb ........................ 8. *Inera*
1. *Knedia Linn.*


An erect or spreading herb; branches 4-angled, thinly villous in older and relatively densely villous in younger parts. Leaves petiolate, elliptic-lanceolate to oblong, serrate, narrowed at both ends; stipular teeth 3-4, stipules forming a bristly sheath by fusing with petioles. Flowers in dense, many flowered, corymbiform cymes. Calyx lobes minute, triangular, unequal. Corolla pinkish or bluish, lobes ovate, obtuse, hairy within. Stamens 4; anthers pinkish. Fruits ellipsoid, 2-seeded; Cocci 3-ribbed.

*Flowering & Fruiting: August-December.*

Rare, occasionally found among thick vegetation.

Athaar 106, Chatavar.

2. *Borreria C.F.... Mey., nom. cons.*


*Spermacoce articulata* Linn. f. Suppl. Pl. 119, 1781.

Borzeria hispida (Linn.) K. Schum. Pflanzenfam. 4, 4:144, 1891
(non Spruce ex K. Schum. 1888).

A procumbent or prostrate herb; stem hispid, hairy or subglabrous, quadrangular. Leaves subsessile, obovato, spatulate, oblong or elliptic, acute or obtuse, rigidly coriaceous, pale when dry, usually very scabrid above, sometimes tinged with red, margins often thickened and cartilaginous, scabrid or ciliate; stipules membranous, hispid and fimbriate, fibria much longer than the body of the stipule.

Flowers 4-6 in a whorl, shortly pedicelled. Calyx hispid, tooth linear-lanceolate. Corolla salver shaped, 4-partite, oblong, acute, bristy out side near the top. Stamens 4, inserted near to mouth or above the middle; filaments short. Style long; stigmas two, capitate, hairy. Seeds brown, cylindrical, rounded on both ends and ridged on one side.

Flowering & Fruiting: February-December.

Abundant, on road sides, grassland and sandy localities.

Ather 3, Kherki Village.


Kohautia gracilis (Wall.) DC. Prodr. 4:430, 1830; HEDW. 225, 1977.

Hedysoria gracilis Wall. in Hook. Fl. Ind. ed. Carey & Wall. 1:371, 1820.


A slender erect, sparingly branched annual, turning black on drying
especially the fruit; lower part of the stem slightly scabrid or glabrous. Leaves opposite, linear-lanceolate, glabrous, nerves indistinct, flat, margins more or less revolute. Calyx lobes long, nearly obtuse, contiguous in fruit, erect.

Flowering & Fruiting: Cold season.

Rare, collected only once from Jalalpur.

Ather 280, Jalalpur.


Flowering & Fruiting: Practically round the year.

Abundant, found in grass land, road sides and cultivated fields.

Ather 137, Bakhshiwala.


**Cephalanthus chinensis** L. *Lycoc. 1:678, 1783.*


**Flowering & Fruiting:** May–December.

**Not common.** Planted as an ornamental and sacred tree.

Athan 350, Civil Lines.

6. **Nusaenda** Linn.


An erect shrub. Leaves opposite, ovate-elliptic, acute-acuminate. Flowers yellow, in terminal cymes. One calyx lobes gets transformed into a conspicuous yellow leaf.

**Flowering:** March–April.

Grown as an ornamental, often as a pot plant.
7. *Hamelia* Jacq.


A large evergreen, shrub. Leaves whorled, unequal, elliptic-oblong.

Flowers in terminal much branched, open cymes, 5-merous, orange-red.

Berries broadly oblong, ribbed.

Flowering & Fruiting: March-December.

Cultivated in gardens.

Asth 563, Eraz Ali Hall.

8. *Ixora* Linn.

*Ixora coccinea* Linn. Sp. Pl. 110, 1753; Bor. & Haizada Beaut. Ind. Cl. & Sh. 96, Pl. 28, 1954.

A much spreading multicauine shrub. Leaves sessile, ovate-oblong, coriaceous, glabrous, entire. Flowers in terminal, compact corymbs, orange-red, 4-merous.

Flowering: May-September.

Cultivated in gardens.
Characters of tribes:

Corolla of disc flowers not ligulate; laticiferous vessels absent.

Tribe I. VERBOCINEAE: Capitula homogamous; corolla tubular; anthers sagittate; pappus hairy; stigmatic branches long with papillae all over the inner surface.

Tribe II. COPACEAE: Capitula homogamous; corolla tubular; pappus bristle or scale like; anther base not sagittate; stigmatic branches papillose on margins only.

Tribe III. ASTERIEAE: Capitula heterogamous with female or neuter ray flowers; anthers not sagittate; stigmatic arms flat.

Tribe IV. HULLAEAE: Capitula homo- or heterogamous; all or only central florets tubular; pappus hairy or bristly; anthers tailed; stigmatic branches with marginal papillae.

Tribe V. HILIANTHEAE: Capitula heterogamous with female or neuter ray florets; involucral bracts not membranous at margins; pappus not hairy; anther base not prolonged; ray florets often with 3 petals; disc florets palesaceous, i.e. with bracteoles.

Tribe VI. ANTHECIDEAE: Like Helianthaceae but involucral bracts scarios at margins and pappus small, annular or absent.

Tribe VII. SEIOLEAEAE: Capitula homo- or heterogamous; involucral bracts with scarios margins and with extra scales; pappus hairy.

Tribe VIII. CYNARIEAE: Capitula homo- or heterogamous; ray florets not ligulate, female or neuter; involucral bracts, spiny; anther base tailed.
Corolla of all florets in the capitula ligulate; laticiferous vessels present.

Tribe IX. CICORIEAE: Capitula homogamous; anthers sagittate.

Key to genera:

Tribe I. VERONICAE

Scabrid herbs; leaves radical; flowers cleft on one side ........................... 1. Euphonanthus

Non scabrid herbs; leaves mostly cauline; flowers 5-lobed, not cleft on one side ......... 2. Vernonia

Tribe II. EUPATORIEAE

Plants with aromatic smell; flowers blue-violet; anthers appendaged at apex ............. 3. Ageratum

Tribe III. ASTERIEAE

Leaves pinnatifid; prostrate, glandular pubescent herbs in moist situations;
pappus cup shaped ................................ 4. Grangea

Leaves entire or toothed; prostrate or erect; pappus none or bristle like.

Prostrate herbs; leaves dentate;
pappus none ..................................... 5. Centipeda

Erect or prostrate; pappus bristly.
Pappus 1-seriate ...................... 6. Conyza

Pappus 2-seriate (outer row of short few hairs) ...................... 7. Erigeron
Tribe IV. INULEAE

Heads radiate, yellow; pappus in a single row ........................................... 8. *Vicia*

Heads disciform; pappus bristly, scaly or none.

Woolly, non aromatic herbs; leaves entire, spathulate; involucral bracts scarious; heads white or golden yellow; flowers very slender ............ 9. *Gnaphalium*

Hairy or glabrous herbs (if densely woolly then either aromatic or prostrate); leaves usually dentate; flowers purple, pink or yellow.

Glabrous herbs; leaf base sheathing; flowers pale-blue or whitish, pappus of 2-scales; semi-aquatic herbs................................. 10. *Caesulia*

Hairy herbs; leaf base not sheathing; flowers purple or yellow; pappus bristly or none.

Heads compact, spherical, purple .................................................. 11. *Sphaeranthus*

Heads disciform.

Receptacle with an outer ring of scales.
Leaves linear; heads sessile, forming leafy spikes, pappus reddish ...... 12. Filago
Leaves obovate, oblong; cluster of heads in the forks of branches; heads yellowish; a densely woolly dichotomously branched prostrate annual .................. 13. Filago

Receptacle naked.
Anther cells tailed ............ 14. Bluemea
Anther cells not tailed ...... 15. Laggera

Tribe V. HELIANTHEAE

Aquatic herbs; heads with 4 (–5) obtuse invelucral bracts; leaves sessile; pappus none ........................................... 16. Enydra

Terrestrial herbs; invelucral bracts more than 4.

Male and female flowers in separate heads; fruits with hooked spines ............. 17. Xanthium

Male and female flowers in the same head.

Outer invelucral bracts elongated, spathulate, sticky; a large herb .......... 18. Siegesbeckia

Outer invelucral bracts not elongated and spathulate.
Pappus none or of 2-4 short scaly bristles.
Leaves entire or or serrate not dissected, opposite.
Small herbs; leaves sessile; flowers white; achenes warty on two sides; pappus none ............ 19. Eclipta
Tall, hispid herbs; leaves long petioled; flowers yellow or yellowish-white; achenes hispid; pappus of 2-5 scaly bristles ............ 20. Blainvillea
Leaves (at least lower) pinnately or bipinnately lobed, alternate; heads not more than 5 mm in diameter ...................... 21. Parthenium
Pappus well developed.
Leaves 1-2 pinnate; achenes topped by 4-5 stiff, retrorsely hispid pappus awns ...................... 22. Bidens
Leaves simple; achenes topped by many, feathery, shining pappus ...................... 23. Tridax
Tribe VI. ANTHEMIDEAE

Nearly stemless herbs; heads at ground level; outer female flowers without corolla; disc flowers male or neuter; acheneae truncate, tipped with persistent style .............................. 24. Soliva

Stem well developed; outer flowers female; disc flowers 2-sexual.

Slender, ascending herbs; leaves 1-2 pinnatisect; heads solitary, long peduncled .................................................. 25. Cotula

Large, erect, often aromatic herbs;
leaves pinnatisect; heads sessile,
in second or subsecond panicked raceme .................................................. 26. Artemisia

Tribe VII. GENECICNEAE

Erect or ascending herbs; leaves lyrate;
bracts 1-seriate, cohering; flowers pink or white; acheneae 5-ribbed ..................... 27. Emilia

Tribe VIII. CYNAREAE

Pappus present.

Corolla pink-purple; acheneae smooth,
shining; erect herbs .......................... 28. Cirsium

Corolla pale-purple; acheneae angled,
grooved and punctate; dichotomously branched, spreading herbs ......................... 29. Amorbon
Pappus absent; flowers yellow; achenes, smooth, truncate

30. *Carthamus*

Tribe IX. CICHERILAE

Flowers blue in axillary sessile heads

31. *Cichorium*

Flowers blue or yellow; heads not sessile.

Pappus spreading at right angle to the beak of achenes

32. *Lactuca*

Pappus not spreading, achenes not beaked.

Achenes reddish, fusiform

33. *Youngia*

Achenes brownish.

Achenes compressed, not truncate at both ends

34. *Sonchus*

Achenes columnar, truncate at both ends

35. *Launaea*

1. *Elephantopus* Linn.


An erect, rhizomatous, dichotomously branched scabrid herb. Stem cylindrical, rigid. Leaves mostly radical, obovate, oblong, narrowing to base, crenate, dorsoventrally scabrid; cauline leaves few, much smaller, sessile or very shortly petioled. Heads many forming a flat topped corymb; surrounded at the base by 3-cordate, foliaceous bracts; involucral bracts linear, 3, biseriate; outer broad, inner narrow. Corolla 5-cleft, purple. Anthers like *V. cinerea*. Pappus of 4-5 bristles.
Ageratum conyzoides Linn.
Flowering & Fruiting: November-January.

Rare. Occasionally found among the undergrowth in mango orchards.

Ather 600, Jhalu Road.


Plants associated: *Argemone mexicana; Rumarie indica; Portulaca oleracea; Striga euphrasoides; Chloris* sp.

Flowering & Fruiting: Practically round the year, except the summer.

Ather 37, Exhibition Ground.

3. *Ageratum* Linn.


A softly pubescent annual with a disagreeable odour; erect or
prostrate, ascending; hair multicellular and more dense on younger parts; lower nodes rooting. Leaves exstipulate, opposite, long petioled; serrate, acute, lanceolate to ovate; base cuneate to subcordate. Heads many, small, discoid; arranged in large terminal dense corymbs; axillary corymbs may also develop. Involucral bracts linear, acute, ribbed on their back, hairy externally; 2-seriate. Flowers all tubular and bisexual. Corolla pale-purple or white, hairy outside, 3-cleft. Anthers white with an appendage on the apex; base obtuse. Style arms long, exserted, hairy. Pappus scales 5, connate below, bared.

This is a polymorphic species varying considerably in flower colour and size of head.

Flowering & Fruiting: Rainy and winter season.

Abundant. Found practically in every nook and corner of the area, but prefers moist and shady localities.

Athar 131, Sanjay Farms.


Artemisia mederosapatae Linn. Sp. Pl. 849, 1753.

A pubescent or villous annual, found in the damp soil or beside water bodies. Stems many, prostrate and spreading in all directions from the root forming circular patches. Leaves many sessile, sinuately pinnatified, pubescent on both the surfaces, lobes coarsely toothed, the terminal lobe largest. Heads leaf opposed
(in small specimens where the leaves are crowded, the heads seem axillary), solitary, rarely paired, shortly peduncled, discoid, yellow. Outer flowers female, 1-3 seriate, fertile, filiform, outer most 2-fid, inner 2-4 fid. Disk flowers bisexual; tube very slender; limb campanulate, 4-5 cleft. Involucral bracts 2-3 seriate, outer herbaceous, hairy, obtuse and with a single nerve. Anthers slightly apiculate (acuminate). Style arms of hermaphrodite flowers pointed. Receptacle conical, globose and smooth. Achenes obconical, flattened, glandular, margined in lower portion. Pappus cupular with fimbriate mouth.

Flowering & Fruiting: October-March.

Abundant, mainly near ditches, ponds and canals.

Athal 43, Vidur Hut Road.

5. Centipeda Lour.


Artemisia minima Linn. Sp. PI. 849, 1753.


A prostrate much branched, sparsely woolly herb. Stems numerous, spreading from the root, slender-leafy. Leaves alternate, many, small, subesclile, oblanceolate, oblong, tapering to the base, toothed, teeth few, thinly woolly abaxially, acute. Heads small, discoid, subescent, axillary, solitary, shortly pedicelled, woolly; bracts
uniseriate, herbaceous, sparsely woolly cut side, obovate to
oblong-obtuse, margins and apex hyaline and slightly fimbriate.

Outer flowers multiseriate, female, fertile. Corolla minute. Disc
flowers few in number, their spicules being tinged with red (in bud).

Receptacle convex. Achenes oblong, 4-angular, patently hairy on
angles. Pappus none.

Flowering & Fruiting: November-March.

Common. In moist and shady localities.

Ather 67, Jhalu Road.

6. Conyza Losa, non. cons.

Key to species:

Stem corymbose branched from above

the base; heads 0.2-0.3 cm across .................... 1. C. stricta

Stem branching from the base (or simple);

heads 0.4-0.5 cm across .............................. 2. C. japonica


Erect, villous annual; stem branching corymbose from above the
base (branching starts after lower half). Leaves lanceolate, linear,
narrow, obtuse, spiculate, denticulate or entire. Heads in terminal,
corymbose, dense panicles, peduncled. Involucral bracts 2-seriate,
hairy, narrow, linear, acute. Corolla of peripheral flowers ligulate,

Flowering & Fruiting: October-March.
Common. Mainly on the boundaries of agricultural fields.

Athus 312, Near Meexan Shah.


An erect villous or woolly herb, rarely glabrate. Stem terete, striate, lower leaves form a rosette, often remain attached to the plant even after drying and can be easily made out. Leaves pubescent; lower subsessile, toothed; upper nearly entire, obovate; spatulate or lanceolate. Heads globose, arranged in dense or lax terminal corymbs. *Involucral bracts* 2-3 coriace, unequal, hairy, linear, acute and with scariosus margins. **Cyna** flowers filiform, with 2-3 teeth. **Disc flowers** 5-toothed; bisexual, greenish-yellow, tubular. **Anther base** entire. **Style** bifid, arms conical. **Receptacle** convex, pitted. **Achenes** compressed, margined and slightly hairy, light brownish yellow. **Pappus** uniseriate.

Flowering & Fruiting: November-March.


Athus 313, Vardhaman P.G. College.


Key to species:

Leaves broad, semi amplexicaul, densely hairy; ray flowers violet ...................... 1. *E. septentrionalis*

Leaves narrow, usually not semi amplexicaul, thinly hairy; ray flowers creamy white ........... 2. *E. canadensis*


Flowering & Fruiting: November-March.

Rare. Occasionally occurs on the banks of Ganges.

Athal 477, Pauri Chet.


Differs from the preceding species in having narrower leaves; narrower heads which are in panicles; flowers yellowish or creamy white; outer flowers not filiform. Achenes thinly hairy.

Flowering & Fruiting: November-March.

Abundant, on road-sides, wastelands and old building walls.

Athal 112, Buhara.


Key to species:

Plants relatively dwarf, softly white woolly .......................................................... 1. *V. vestita*

Plants tall, scabrid hairy ...................................................... 2. *V. indica*


An erect, branched, softly woolly herb. **Leaves** sessile, oblong lanceolate, serrate, obtuse; base explexicaul. **Heads** solitary, on woolly peduncles. **Involucral bracts** softly white villous, 4-seriate, long acuminate, linear; tips recurved. **Ray flowers** yellow. **Achene** thinly hisp. **Pappus** scanty, white.

Flowering & Fruiting: Winter season.

**Common in the vicinity of Ganga. Mainly near Ruchya Ganga Barrage.**

**Ahar 64, Ganga Barrage.**


**Differs from preceding species in taller habit; scabrid plant body; leaves longer and acute; involucral bracts glabrous.**

Flowering & Fruiting: Winter season.

**Not uncommon. Found in agricultural fields; prefers sandy soil.**

**Ahar 123, from near Kherki.**

Key to species:

Heads golden yellow; in terminal clusters without supporting leaves; pappus hairs not connate at base to form a ring ........................................ 1. *G. luteo-album*

Heads dull greyish, terminal as well as axillary; supporting leaves present; the pappus hairs connate at base to form a ring ........................................ 2. *G. pensylvanicum*


Flowering & Fruiting: January-May.

Common, on dried river and canal beds and banks.

Athisar 91, Mandawar.


**Gnaphalium spatulatum** L. *Encycl.* 2:1750, 1793 (non Bux. f. 1768).


An annual herb, sparsely cottony. Stems many from the base, solid and terete. Leaves alternate, spatulate, entire, mucronate, more cottony beneath; nerves not distinct except the midrib. Heads in leafy, globose, axillary clusters, arranged in spikes. **Involucral bracts** membranous, acute, 3-4 seriate, shining. **Flowers** tubular, filiform; pappus nearly equalling the corolla tube and cohering at the base. **Receptacle** naked, flat and tuberculod or pitted. **Achenes** cylindrical and rounded on both the ends, papillosce.

**Flowering & Fruiting:** December-April.

Common. In agricultural fields, waste lands and road sides.

Athen 333, Nal Basti.

10. **Caesula** Roxb.

**Caesula axillaris** Roxb. *PL. Cor.* 1:64, t. 9b, 1798; *IDI.* 3:29, 1881; *FUGP.* 1:422, Repr. ed. 1960; *HFB.* 248, 1977.

An ascending annual, marshy herb; lower nodes often rooting. Stem streaked, brownish, glabrous. Leaves lanceolate, serrate, acute, glabrous; base semioamplexicaul, sheathing. Heads globose, compound (the seemingly one head is the result of connation of 3-4 heads). Involucral bracts 2-3 seriate; outer broad, acuminate, ciliate; inner linear; upper part of the involucral bracts tinged with or
Achene dark brown, obovoid, ribbed, winged. Pappus scales 2, 
ovate-lanceolate.

Flowering & Fruiting: August-March.

Common, mostly in rice fields and on the marshy margins of the 
ditches. Its presence on dry soil is not something unusual, but 
the growth, there, is greatly stunted.

Ather 101, Hanrajpur.

11. Sphaeranthus Linn.

Sphaeranthus indicus Linn. Sp. II. 927, 1753; I BI. 3:275, pro parte; 
1960; field. 293, 1977.

A much branched ascending, hairy (not glandular hairy) annual herb, 
prostrate, decumbent. Leaves sessile, obovate, oblong narrowed to 
the base, obtuse or subacute and usually with a long bristle at the 
tip, dentate or serrate; the teeth often bristle pointed, hairy on 
both surfaces (not glandular). Head a cluster of numerous closely 
packed capitula. Involucral bracts shorter than the heads, ciliate 
at the apex. Flowers purple-red. Pappus none. Achene stalked, 
smooth.

Flowering & Fruiting: December-May.

Common, grows on dry marshy soil.

Ather 216, Bijnor.


A small, somewhat hispid herb, with ascending branches. Stem terete, brown in older parts. Leaves alternate, sessile, subulate, coriaceous; upper surface densely silvery woolly; margins entire, revolute near the apex, acute; apex spinoscent. Heads in leafy spikes (actually in the leaf axils on the major portion of the plant). Involucral bracts hyaline, scarious, ovate, cuspidate, multiseriate. Flowers all tubular; outer female and filiform; inner bisexual, yellowish-white. Anther bases sagittate; apices acute. Style bifid, arms somewhat truncate. Pappus present only in inner flowers, uniseriate and feathery, especially near the apex. Achenes cylindrical, oblong, with a longitudinal, faint furrow. Receptacle obconical.

Flowering & Fruiting: January–March.

Rare. Sometimes found in sandy, barren soil.

Ather 259, Mandawar Road.


*Filago germanica* auct. Pl. (non Linn. 1753); FSI, 3:277, 1881; FUGF, 1:419, Suppl. ed. 1960.
A prostrate, densely white woolly herb, forming mat like patches on the soil. Stems dichotomously branched. Leaves crowded towards the ends of branches, spatulate, sessile; base narrow; densely white toochate adaxially. Heads in terminal clusters, Involucral bracts 2-3 scarious, lanceolate, acuminate. Achenes minute, papillose. Pappus hair white.

Flowering & Fruiting: Winter season.

It grows on the dried beds of ponds and ditches.

Ather 471, Rooppur Road.


Key to species:

Flowers yellow.

Plants erect or ascending:

Receptacle glabrous; corolla lobes of bisexual flowers nearly glabrous;

Achenes sub 4-locous, not ribbed, glabrous ...................... 1. *B. lacera*

Receptacle hairy; corolla lobes of bisexual flowers hairy; achene

8-10 ribbed, silky .................. 2. *B. leciniata*

Plants prostrate, decumbent; leaves small, obovate-lanceolate, coarsely spinulose dentate; stamens often absent from disk flowers .................. 3. *B. oxyodonata*
Flowers purple; leaves densely villous; heads crowded at the top of branches in long spiciform panicles; achenes hairy...... 4. *A. mollis*


*Conyza lacera* Burn. f. Pl. Ind. 180. t. 59. f, 1768.

Strongly aromatic; erect, long villous, glandular herbs. Stem mostly simple, terete, often tinged with purple (especially in lower part). Leaves obovate-oblong, obtuse or acute, petiolate, crenate-dentate, hairy on both surfaces. Heads in a leafy compound panicle. Involucral bracts linear, acute, glandular, hairy. Corolla lobes glandular hairy. Achenes hairy.

Flowering & fruiting: May-August.

Abundant. It thrives best in moist and calcium rich localities. Usually it grows in the cracks or on the denuded portions of the walls near some water outlet.

Athin 329, Bijnor.


An erect, tall, pubescent or thinly tomentose herb, branching from the base, glandular. Lower leaves petiolate, lirate-pinnatifid,

Flowering & Fruiting: March–April.

Rare. Occasionally found on canal banks.

Athal 475, Bandawar.


Flowering & Fruiting: January–April.

Not uncommon. Found on waste land and 'Pazayas' (the mound formed by the ash and waste debris of brick kilns.).

Athal 209, Bijnor.


*Erigeron mollis* D. Don., Prodr. 172, 1825.

Erect densely villous, strongly aromatic, erect herb; branching from the base, hairs simple as well as glandular. Leaves obovate, oblong, sessile or subsessile; apex rounded or obtuse, crenate-serrate. Heads in dense, leafy, apiculate, terminal panicles. Involucral bracts linear, acute, hairy. Corolla hairy, purple.

Achenes hairy, angled, not ribbed.

Flowering & fruiting: January–April.

Abundant. In grass lands and orchards, on road sides and wastelands, occasionally on walls.

Athar 264, Peda.

19. **Laggeza** Sch.-Dip. ex Kochent.


*Cenypa aurita* Mill. ed. Fl. 3:1929, 1804.


Flowering & fruiting: November–May.
Abundant on road sides, waste places and old walls.

Athar 34, Near Sugar Hill.


A prostrate marshy herb, rooting at the nodes. Stem green, with purple tinge; younger parts thinly, pubescent, fleshy. Leaves opposite, decussate, sessile; leaf bases shortly auricled (more so in mature leaves), oblong; margins dentate, both the surfaces distinctly punctate; slightly fleshy. Inflorescence terminal, capitulum sessile and with four involucral bracts (occasionally there may be two or more additional rudimentary bracts) two outer longer and two inner smaller, ovate, entire and acute-obtuse, externally punctate. Ray florets female, embraced by a navicular pappus; petal lobes 2-3, pinkish. Style arms unequal. Disc florets bisexual, reddish or brownish. Stamens apiculate. Both the style arms with a shallow notch. Receptacle conical. Achenes oblong.

Flowering & Fruiting: Winter season.

Occasionally found on the banks of Ganga.

Plants associated: *Segittaria sagittifolia*, *Hydriila verticillata*, *Vallisneria spiralis*.

Athar 224, Rawli Ghat.
17. *Xanthium* Linn.


Erect, simple or branched, shrubby, scabrid herb. Stem terete, rough, often blotched with purple. Leaves long petioled, palmately 3-5 lobed, coarsely dentate, cuneate. Flowers male and female flowers in different heads; heads fascicled or solitary. Female head short peduncled, involucral bracts 2-3 serrate, linear, acute, ciliate. Corolla greenish, hairy. Fruit hard, covered with hooked spines and a pair of larger hooks at the tip.

Flowering & Fruiting: July-January.

Abundant, on road-sides and wastelands.

Ather 15, Chandpur.

18. *Siegesbeckia* Linn.


A tall, pubescent annual, dichotomously branched in upper part. Leaves opposite, long petioled, rhomboid, appressed pubescent on both the faces; margins irregularly dentate, acute, base cuneate. Heads small, glutinose, arranged in leafy panicles. Involucral bracts outer long, spatulate, spreading, glandular hairy out side and gland viscid inside; inner bracts shorter, oblong, boat shaped, glandular hairy. Flowers yellow. Achenes curved, 4-angled, viscid. Pappus none.
Flowering & Fruiting: Rainy to winter season.


Ather 453, Haldaur.


Verbesina alba Linn. Sp. Pl. 902, 1753.


A strigose slender herb. Stems terete, erect or prostrate, rooting at the nodes, green or tinged with purple. Leaves sessile, op. white, oblong-lanceolate, entire or serrate, strigose on both surfaces. Heads solitary or paired, on unequal strigose peduncles. Involucral bracts acute, strigose outside and glabrous inside. Ray flowers ligulate, ligules entire or notched, white. Disk flowers tubular, 5-toothed. Anthers not tailed. Style bifid, hairy in upper part. Receptacle slightly convex and bristled. Achenes 3-angled, 2-angles winged; faces tubercled. Pappus non- or represented by few minute teeth.
Flowering & Fruiting: Practically throughout the year.

Abundant. Found along water drainages, road sides, borders of fields and on old walls.

Athur 129, Chah Shirin.


Verbesina acmella Linn. Sp. Pl. 901, 1753.


Blainvillea latifolia (Linn. f.) DC. Prod. 5:492, 1836; FBI. 3:305, 1881.


Erect, simple or divaricately branched, scabrid annual. Leaves long petioled, ovate or ovate-lanceolate, acute, serrate; cordate or subcordate at the base; both the surfaces hispid. Heads in terminal, dichotomous, flat topped cymes. Involucral bracts outer stiff, hispid and acute; inner membranous. Ray florets ligulate, white, 2-dentate (bifid), fertile. Disc flowers corolla 5-toothed. Achenes outer 3-angular and inner compressed, cuneate, transversely rugose. Pappus paleaceous, connate at the base.

Flowering & Fruiting: Rainy season.

Occasionally found on the borders of agricultural fields.

Athur 289, A.J.P. Agricultural Farm.

A tall, erect, gregarious herb. Stem grooved, hairy. Leaves pinnately or bi-pinnately dissected; segments linear; upper leaves undivided. Heads white, numerous, 4-5 cm in diameter; arranged in axillary or terminal corymbose cymes. Male flowers all male. Achenes obovate, black, crowned by the persistent remnants of corolla, appendage and style.

Flowering & Fruiting: Throughout the year.

Forms dense stands on wastelands and road sides.

Ather 306, Near Sugar Mills, Bijnor.

Flowering, seed setting and their germination takes place round the year in this species. Specimens in all the stages of development may be observed in the same population.

22. *Bidens* Linn.


An erect dwarf or tall herb. Stem 4-gonous, striate or sulcate. Leaves imparipinnately bipinnate; segments ovate-lanceolate,
**Bidens pilosa var. pinnata** (L.) Sherff.

A. A flowering branch, B. A disc floret, C. A ray floret, and D. A cypsela.
Bidens pilosa var B-minor (Bl) Sherff
serrate or unequally dentate, acute, cuneate; in dry specimens edaxial face turns darker while abaxial face remains green. Heads ligulate, corymbose, panicled. **Involucral bracts** outer linear, ciliate. **Anther** sagittate. **Achenes** elongated, 4-angled, crowned with 2-4 stiff, retrose, barbed arms.

**Flowering & Fruiting**: Winter season.

Abundant. Found on road sides, in grass lands, gardens etc.

Athr 353, Vardhaman P.G. College, Bijnor.

23. **Tridax** Linn.


A procumbent, hairy annual. **Leaves** confined to the lower 1/4 part, pectinate, dark green above, slightly fleshy; ovate, lanceolate or rhomboid, acute-subacute, cuneate; hair tuberolab based. **Heads** solitary on long hairy peduncle. **Flowers** yellowish-white to yellow. **Involucral bracts** outer densely hairy, ovate, oblong, acuminate; inner longer, membranous, glabrous. **Ray florets** ligulate, ligule 3-partite, female. ** Disk florets** tubular, 5-fid, bisexual; style arms hairy. **Achenes** turbinate or oblong, hairy. **Pappus** feathery, bristly.

**Flowering & Fruiting**: During the major part of the year.

Abundant. Found on road sides, wastelands grass-lands and often on walls.

Athr 119, Exhibition Ground.


*Flowering & fruiting*: Cold season.

Common. In road side damp ditches.

*ATHER 258, Mandawar Road.*

25. *Cotula* Linn.


A prostrate, decumbent annual, glabrous, young parts puberulous. *Leaves* petiolated, 2-pinnatisect; segments linear, oblong, lanceolate, acute; tip aristate. *Heads* axillary and terminal, erect, on long peduncles. *Involucral bracts* 2-seriato, oblong, acute to obtuse.
Flowers yellow, outer flowers apetalous. Anther bases obtuse, entire. Style arms truncate or obtuse in case of 2-sexual flowers and sometimes entire in marginal flowers. Achenes marginal not winged.

Flowering & Fruiting: Winter season.

Not uncommon. Found in moist, shady places.

Author 30, Henraujpur.

26. Artemisia Linn.

Key to species:

A dwarf herb; stem purple; leaves pinnatisect, glabrous; segments filiform ............ 1. A. scoparia

A tall herb; stem not purple; leaves broad; in dried specimens upper surface turns brownish and lower remains white due to tomentum ......................... 2. A. nilagirica


Erect, aromatic, annual herbs, gregarious; base woody. Stem purple terete, glabrous, younger parts puberulous. Leaves pinnatisect; segments filiform, linear, glabrous, acute, entire. Heads axillary, sessile, whitish-brown, forming a paniculate inflorescence.

Flowering & Fruiting: September-November.

Abundant. On road-sides, wastelands and agricultural lands. During weeding operations it leaves blue black stain on the hands. Prefers sandy soil.

Atha 11, Khorki Village.


*Artemisia vulgaris* Linn. var. *nilagirica* Clarke, Comp. Ind. 162, 1876.

*Artemisia vulgaris* auct. pl. (non Linn. 1753); FHL. 3: 325; FHL. 1: 435, Repr. ed. 1960.

Differs from preceding species in tall size; sulcate stem; broad leaves (lower pinnatisect), upper surface nearly glabrous, turning brown black in dried specimens and lower surface white tomentose. Heads in spiciform, secund, horizontal racemes.

Flowering & Fruiting: October-December.

Not uncommon. Found in association with *Themeda* sp., *Apluda* sp. and *Saccharum* sp.

Atha 390, Jalalpur, Fazalpur.
27. Emilie Cass.


Cacalia sonchifolia Linn., Don. Prod. 180; Roxb. Fl. Ind. 3:413.

A slender, glaucous herb, puberulous (in my specimen), the hairiness is more dense on the lower parts of the lateral branches than the main stem. Stem erect or diffused, often rooting at the nodes, branched. Lower leaves petiolate, lyrate-pinnate, upper segment usually the largest, obovate, entire or sinuate. Upper leaves smaller with coarsely toothed and undulated margins; bases ampeliscaul, the auricles acute or obtuse; nerves more pronounced on abaxial surface; midrib slightly purple or not. Heads solitary or laxly corymbose; peduncles slender and nodding when young; mature heads cylindrical. Involucral bracts linear, acute, uniseriote, fused. Corolla tube 5-toothed, pink or white. Anthers in the upper part of the tube not in the middle, apex much elongated and filiform. Stylo arms half cylindrical; tip conic. Achenes 5-ribbed, ribs scabrid. Pappus white.

Flowering & Fruiting: Nearly throughout the year.

Abundant, in moist and shady places.

Ather 181, Prithipur.

28. Circaea Mill.

*Cirsium arvense* (Linn.) Scop.
Serratula arvensis Linn. Sp. PI. 820, 1753.


A spinous, erect, branched, stout herb. Stem obtusely grooved, appressed silky with long silky hairs. Leaves alternate, sessile, densely white tomentose abaxially; margins undulated and unequally spinous; the spines, on major vein endings, larger; apex acute, base decurrent. Inflorescence solitary axillary. Heads oval before anthesis. Involutural bracts multiserrate; outer ones smallest and broad; inner most largest and linear, single nerved, spine tipped; the tip reflexed outwardly. Flowers all tubular, corolla pink. Anthers base shortly sagittate; apex acute. Style bifid; arms flat and glabrous. Receptacle conical, long hairy. Pappus dirty-white, copious.

Flowering & fruiting: January-April.

Not uncommon. Round along water channels.

Atha 504, Hamraipur.


Carduus ramosus Roxb. Fl. Ind. 3:107, 1832.


Micranthes divaricata DC. Prodr. 6:562, 1837.


Flowering & Fruiting: January-July.

Common in sandy soil.

Athan 277, Jhalu Road.

30. Carthamus Linn.


Flowering & Fruiting: March-June.

Not common. Occasionally found on road-sides and in harvested wheat fields.

Athan 639, Bijnor.
31. Cichorium Linn.


An erect, branched herb. Stem terete, faintly ribbed, hispid. Leaves subsessile or sessile, spatulate, coarsely dentate, sparsely hairy on both the surfaces. Heads in clusters. Involucral bract, 2-seriate; outer gland pubescent; inner glabrous. Corolla ligulate, blue. Achene tubinato, obscurely 5-angled, light brown. Pappus scaly, white.

Flowering & Fruiting: February-April.

Common in "Dorein" (*Trifolium alexandrinum*) fields.

Athar 241, Mohammadpur.

32. *Lactuca* Linn.

Key to species:

Slender, glabrous; blue flowered herb ............ 1. *L. dissecta*
Larger, hispidly hairy; yellow flowered herb .... 2. *L. escarola*


Erect, slender, annual herb. Stem corymbose branched at the top; tinged with pink or light purple, glabrous throughout. Leaves lower ones lyrate-pinnatifid, segments entire or remotely denticulate; upper leaves usually at the forks and with a stem clasping base, entire, acute. Heads numerous, peduncled. Flowers light blue, all ligulate. Involucral bracts biseriate; outer ovate, smaller; inner
longer, linear. Achenes shining, dark brown, transversely rugose; beak pale, filiform. Pappus white.

Flowering & Fruiting: March–April.

Common in damp grassy localities.

Athar 200, Mirag Vihar, Bijnor.


A tall annual herb, lower part of the stem hispidly hairy; hairs yellow to brown. Leaves sessile, appressed; suricles of the base obtuse, margins ciliate or entire; apex shortly acuminate or acute; upper surface glabrous; lower hispidly hairy on midrib. Heads pedicelled, arranged in terminal panicles. Achenes slightly compressed and margined, more scabrid near the apex; each face 5-ribbed.

Flowering & Fruiting: February–June.

Often found in cool shady places.

Athar 180, Bijnor.

33. *Youngia* Cass.

*Youngia japonica* (Linn.) DC. Prodr. 7:194, 1838; HFBDB. 290, 1977.


*New record for Upper Gangetic Plains.*
Erect annual herb, with milky latex. Stems ribbed, glabrous or puberulous. Leaves mostly radical and forming a rosette, variable in shape, sinuate lobed, glabrous, membranous; cauline leaves few, sessile. Heads numerous, peduncled; peduncles filiform, glabrous; arranged in a corymbose panicle. Involucral bracts 2-seriate; outer shorter; inner longer. Flowers all ligulate, yellow. Achenes fusiform, compressed, red, rugose, ribbed. Pappus white, coriaceous.

Flowering & Fruiting: December-June.

Occasionally found in moist and shady places.

Ather 510. Promises of water works Department.

34. Sonchus Linn.

Key to species:

Leaves spinescent; achenes not transversely rugose ........................................ 1. S. asper
Leaves not spinescent; achenes transversely rugose ........................................ 2. S. oleraceus


Sonchus oleraceus var. asper Linn. Sp. Pl. 794, 1753.

An erect, stout annual herb. Stem filiform, tinged with purple, glabrous, sometimes glandular above. Leaves basal, in a rosette, ovate, oblong, reniform-pinnatifid, tooth spinescent; semiamplex-
caul, auricles rounded, appressed. Heads in compact terminal
corymbs. Involucral bracts glabrous or with few glandular hair.
Flowers all ligulato, yellow. Achenes compressed; faces 3-ribbed.
Pappus copious, white.

Flowering & Fruiting: Cold season.

Common. In wastelands, road-side ditches, fields and on old walls.

Athal 533, Datyana.

2. Conchus oleraceus Linn. Sp. fil. 794, 1753; F&H. 3:414; 1881;

Differ from above species in being relatively floccid; leaves
fewer, broader, darker in colour and without any spine. Achenes
3-ribbed and transversely rugose.

Flowering & Fruiting: Cold season.

Abundant. Prefers damp and shady localities.

Athal 46, Bijnor.

35. Leunaea Case.

Key to species:

Heads terminal; latex white; a
smaller plant ............................... 1. L. asplenifolia
Heads more or less racemose;
latex yellow; a larger plant ............... 2. L. falex

1. Leunaea asplenifolia (Willd.) Hook. f. FBL. 3:415, 1881; FUDP.

Microrhynchus asplenifolius (Willd.) DC. Prodr. 7:81, 1838.

Annual or biennial; multicauline herbs; glabrous, latex white. Leaves in a rosette, obovate, oblong-elliptic, lunate pinnatifid; lobes minutely toothed. Flowers many, paniculately bracteate, leafless. Heads in terminal clusters, peduncles short. Flowers all ligulate, yellow. Anthers bases sagittate. Achenes oblong, angled and ribbed; ribs hairy. Pappus multiseriate, white.

Flowering & Fruiting: Cold season.

Not common. Occasionally found in fallow land.

Athar 339, Near Deyal Industries.


Microrhynchus fallax Jaub. et Spach, Ill. Orient. 3:106. t. 276, 1875.


Chondrilla nudicaulis Linn. Mant. 273, 1767.

Differ from preceding species in its larger size; yellow latex and flowers arranged racemously on flowering branches.

Flowering & Fruiting: Cold season.

Abundant. Found in gardens, agricultural fields, wasteland and on road-sides, etc.

Athar 316, Nai Basti, Bijnor.
LVII- CAMANULACEAE

Key to genera:

A pubescent herb; flowers shortly pedicelled or subsessile, dimorphic ............ 1. Campanula

A nearly glabrous herb; flowers long pedicelled, not dimorphic ..................... 2. Wahlenbergia

1. Campanula Linn.


Campanula canescens Wall. (Cat. no. 1299, 1829 nom. nud.); FBL. 3:439, 1881; FUCP. 1:454, Repr. ed. 1960; ROY. Ill. 293; FI. Sinal. 291.

A erect pubescent herb. Stems 1-many originating from the base, angular and grooved. Leaves upper alternate, lower crowded, linear-lanceolate, acute to obtuse, hairy, crenate, sessile. Flowers many in panicked or axillary clusters, dimorphic, one complete and the other smaller and without corolla or stamens (cleistogamous), both forms develop on the same stem. Calyx-teeth linear-lanceolate, smaller in the imperfect flowers, fused at the base and the tube 5-nerved, hairy. Corolla campanulate in open flowers and plicate in bud, violet in colour, lobes short and obtuse, hairy out side. Stamens 5; filaments recurved, dilated at the base, shorter or equal to the lobes. Ovary 3-4 celled (as observed); ovules numerous in each cell. Style short cylindric, hairy; stigma shortly 3-fid.
Plants associated: *Centaurium pulchellum*, *Evolvulus alsinoides*, *Evolvulus mammularius*, *Fimaristylis* sp., *Polycarpum prostratum*, * Tribesema indicum*.

Flowering and Fruiting: December-May.

This plant is mostly found in the flood plains of Ganga or its tributaries. Sometimes found also on old building walls.

This plant exhibits, "Heterosandy" in the sense that in some cases the filaments are equal to the anther lobes while in others slightly shorter than the anther lobes.

Ather 70, Mandowar, Rawli.

2. *Wahlenbergia* Schrad. ex Roth, non. con.


*Campanula gracilis* Forst. Prodr. 15, 1786.


A nearly glabrous herb, sometimes slightly hairy in lower portion. Stem erect or decumbent, simple or divaricately branched from the base. Leaves sessile, linear to obovate-oblong, more or less toothed; each tooth with a white spot at the apex; margins often thickened or undulate. Flowers in lax cymose panicles; pedicel long and slender; upper bracts linear, acute. Calyx tube turbinate, lobes acute,
triangular, erect in fruit, persistent. Corolla campanulate, blue, divided half way down the tube into broad, oblong lobes. Stamens with filaments much dilated at the base, hairy. Capsule tapering into pedicel. Seeds ellipsoid, compressed, smooth.

Plants associated: Ranunculus cantonensis, Spergularia fallax, Boronia ammannioides, Bothrispernum tenellum, Cot la sp., Murdannia sp., Echinochloa crusgalli.

Flowering & Fruiting: September-March.

Commonly found in shady and grassy localities. This plant varies to a great extent as regarding its height, leaf size, shape and flower size.

Athen 205, Sharam Nagar.
LVIII- SPHENOCLEACEAE

**Sphenoclea** Gaertn., nom. cons.


An annual, marshy herb with branched or simple stem. Leaves simple, oblong-lanceolate. Flowers in terminal compact erect spikes, bracteate and bracteolate. Sepals 5, connate to form calyx tube, accrescent and persistent. Petals white, 5, connate, campanulate; lobes orbicular to acute. Stamens 5, free, epipetalous; filaments short. Ovary inferior, 2-celled; ovules numerous; style 1; stigma obscurely 2-lobed. Fruit a circumsissile capsule. Seeds numerous, minute, light-brown.

Flowering & Fruiting: September-October.

Not uncommon, found in marshy places or along the edges of ditches.

Ather 409, Muzaffar Nagar Road.
LIX. PLUMBAGINACEAE sens. lat.

Plumbago Linn.

Key to species:

Large erect under-shrubs; flowers pure white; racemes up to 25 cm long ............ 1. P. zeylanica
Smaller straggling or scrambling herbs; flowers bluish-white; racemes not more than 15 cm long ................................ 2. P. auriculata


Erect shrub, branches often rambling. Stem slightly woody at base. Leaves simple, alternate, ovate-oblong, petiole amplexicaul and auricled. Flowers in terminal or axillary spicate racemes; bracts foliaceous. Calyx sepals 5, tubular, gland pubescent, viscid. Petals 5, gamopetalous, tube long, lobes spreading, reflexed at length, white. Stamens 5. Ovary 1-celled, glabrous; style 1; stigmatic rays 5. Fruit a capsule, oblong enclosed in the calyx tube.

Flowering & Fruiting: August-February.

Often found near villages.

Athar 211, Near Jalalpur.


This taxon is easily distinguishable from the former by its spreading or straggling habit, 2 large stipuleoid auricles of the petiole, shorter racemes and bluish flowers.

Flowering & Fruiting: Rainy Season.

Occasionally planted in pots as ornamental.
LX. PRIMULACEAE

Key to genera:

Leaves in radical rosette, reniform, petiolate; flowers white; fruiting pedicel not nodding ................................ 1. Primula

Leaves oblong-lanceolate, cauline, sessile; flowers violet or pink; fruiting pedicel nodding ................................ 2. Anagallis

1. Primula Linn.


Grossera umbellata Lour. Fl. Cochinch. 186, 1790.


A glandular pubescent, annual herb. Leaves petiolod, in basal rosette, orbicular or subreniform, base cordate or subtruncate, crenate. Sepals many, much longer than the leaves, glandular hairy. Flowers in 3-6 flowered umbels; pedicels unequal. Calyx deeply 5-cleft, slightly accrescent. Corolla white, throat narrow; lobes obtuse. Capsule globose.
Primula umbellata (Lour.) Bentvelzen

A. Plant with flowers, B. Flower, and C. Ovary in T.S. showing free central placentation.
Primula umbellata (Lour.) Bentvelzen
Plants associated: *Campanula wallichii*, *Salvia anthemifolia*,
*Gnaphalium indicum*, *Catharanthus pusillus*, *Phyllanthus fraternus*,
*Saphorbia parviflora* etc.

Flowering & Fruiting: December-January.

Common, prefers shady and humid situations. However, I have collected it from as dry a situation as a brick kiln.

Athar 202, Dharam Nagar.

2. *Anagallis* Linn.


An erect or ascending annual, branching from the base. Stem 4-angled, narrowly winged. Leaves sessile, oblong-lanceolate, entire, acute, glabrous. Flowers solitary-axillary, pedicelled; the pedicel elongates as the fruit matures and becomes decurved; violet or pink in colour. Petals slightly coherent at the base, margins fringed. Stamens covered with purple, moniliform hair. Capsule globose, 4-6 mm across, circumcissile.

Plants associated: *Crepis diphylla*, *Stellaria media*, *Silene
conside*, *Vicia hirsuta*, *Asphodelus tenuifolius*.

Abundant. One of the dominant weeds of the area.

The plant growth and extent of branching is an indicator of the degree of moisture in the soil. It shows maximum growth and branching in well watered soil. While in extremely dry situation the whole plant remains limited to 5-6 small leaves and 1-2 flowers.
In this plant the operculum of immature fruit is red and transluscent, thus permitting the entrance of a considerable amount of light. As the same time the surface of developing seeds, which faces the operculum, is green. It seems that the developing seeds meet some of their food requirement themselves.

Athar 32, Vidurkuti Road.
Key to genera:

Flowers 4-merous; stamens 8; style short ....... 1. *Mimusops*

Flowers 3-merous; stamens 6; style subulate ... 2. *Manilkara*

1. *Mimusops* Linn.


A medium sized tree with dense canopy and dark-grey, longitudinally fissured bark. Leaves elliptic-ovate, subcoriaceous, margins slightly undulate. Flowers axillary, fascicled, fragrant, creamy-white; pedicel often recurved. Sepals 6, 2-seriate, connate at base. Petals 8, connate, seemingly 24 due to 2 petaloid appendage on each lobe, creamy-white turning to brownish. Stamens 8, alternating with 8 staminodes. Ovary pubescent, 3-celled; style short. Fruits ovoid berry, yellow or orange, 1-2 seeded.

Flowering & Fruiting: February-January.

Often planted in mosques.

Atha 704, Jama Masjid, Chah Shirin.


Flowering & Fruiting: December-April.

Planted in gardens and on road sides.

Athaar 548, Najibabad Road.
**Diospyros Linn.**


*Diospyros montana* Clarke in FDI. 3:335, 1882 (pro parte).

A small crooked tree, with dark-grey bark. Leaves alternate, oblong-lanceolate, acuminate, cordate, hairy. Male flowers in 3-flowered peduncled cymes, bracteolate. Sepals 4, basally connate, hairy. Petals 4, tube campanulate. Staminodes not consistent in number, usually 16 in 6-8 pairs inserted at different levels. Female flowers solitary-axillary, bracteate. Staminodes often present 6-12. Ovary 6-8 celled; styles 4. Fruit a yellow to orange-yellow berry, with persistent accrescent calyx lobes. The sap of fruit, when exposed to air, turns brown.

Flowering & Fruiting: March-August.

Planted. Abundant around the Shrine of Meeran Shah.

Ather 546, Ziarat Meeran Shah.
Key to genera:

Young branches cylindrical; leaves smooth;
corolla without orange-red tube .................. 1. **Jasminum**

Young branches 4-angled; leaves scabrid;
corolla with orange-red tube ...................... 2. **Nyctanthes**

1. **Jasminum** Linn.

Key to species:

Leaves simple.

Flowers in 3-5 flowered cymes ...................... 1. **J. sambac**

Flowers in many flowered cymes .................... 2. **J. multiflorum**

Leaves imparipinnate; calyx tube minute ........ 3. **J. auriculatum**


**Nyctanthes sambac** Linn. Sp. Pl. 6, 1753.

A scandant shrub, 1.0-1.5 m high. Leaves oval-ovate, entire. Flowers in 3-5 flowered, terminal cymes; calyx lobes 7-10, filiform. Corolla segments 8-numerous, lower half fused to form a tube, white in colour, fragrant. No fruit setting.

Flowering: June-November.

Cultivated in parks, schools and private gardens.


**Nyctanthes multiflora** Bum. f. fl. Ind. 5, t. 3, f. 1, 1760.

**Jasminum pubescens** Miller. fl. fl. 1: 137, 1797; fl. fl. 3: 592, 1882; fl. fl. 8: 229, f. 129, t. 70, 1954.

A sub-scandent shrub; branches drooping. Leaves ovate-lanceolate, pubescent. Flowers in axillary, many flowered cymes, heterostylous. Calyx lobes 7-9, linear, filiform, pubescent. Corolla tube shorter than the calyx lobes; segments oblong-lanceolate, white. No fruit setting in the area.

Flowering: July-September; January-April.

Cultivated in gardens and parks.

Athen 4:8, Engineer's Hostel.


A scandent or twining shrub; young branches densely pubescent. Leaves 3-foliate; the lateral leaflets reduced to auricles. Flowers in terminal cymes, star shaped, white, fragrant. Calyx tube minute or obsolete. Fruit a globose berry, black when ripe.

Flowering & Fruiting: July-December.

Cultivated in gardens on poles and paragolas.

Athen 480, Agri House.
2. *Nyctanthes* Linn.


A small tree. Young branches 4-angled. Leaves ovate-oblarp, scabrid. Flowers in terminal cymes. Corolla tube orange-yellow; limb white. Fruit a compressed, orbicular capsule, splitting into 2,flat, 1-seeded pyrenes.

Flowering, fruiting: September-January.

Cultivated in gardens and houses for its fragrant flowers.

Ather 469, Bijnor.

The systematic position of this taxon has long been a point of controversy among the systematic botanists. Different authors have placed it in different families (Cleaceae, Verbenaceae and Nyctaginaceae). Mathkiew and dieter Bees (1984) have critically examined the habit, floral morphology, fruit and seed, stem anatomy, leaf anatomy, indumentum, stomata, foliar sclereids, crystals, petiole, flower vasculature, embryology, pollen, chromosome number and phytochemistry of *Nyctanthes* and compared them with other members of the Cleaceae. These attributes of *Nyctanthes* were found compatible with accommodation of the genus in the family Cleaceae.
LXIV. APUCYNACEAE

Key to genera:

Trees.
Leaves coriaceous, large (30 cm long),
confined to the ends of branches;
flowers white with yellow or red tinge ... 1. Flumeria
Leaves short (less than 10 cm long),
not coriaceous.
Leaves broad; flowers white;
fruit a divaricate, white dotted
follicle ........................................... 2. Halorrhena
Leaves linear-lanceolate; flowers
pure yellow; fruit a depressed
globose, angled drupe ................. 3. Thevetia

Shrubs or Herbs.

Climbers.
Younger parts ferruginous; leaves
not punctate; anthers without any
outgrowth at the back ............... 4. Ichneocarpus
Younger parts not ferruginous;
leaves punctate; anthers with
globular outgrowth at the back ...... 5. Vallaria

Erect.
Armmed shrubs ............................... 6. Corissa

Unarmed.

Leaves opposite.
A woody shrub .................. 7. Tabernasmontana
A small herb .................... 8. Catharanthus
Leaves in whorls of three ....... 9. Nerium

1. Plumeria Linn.

Key to species:

Flowers red, golden yellow inside and red
tinge out sie .................................. 1. P. rubra
Flowers white cream with a yellow centre .... 2. P. acuminata

A small, crooked tree, 2-5 meter tall; branches spreading. Leaves oblong-lanceolate, short-acuminato, coriaceous. Flowers in terminal, long peduncled corymbs, red, golden-yellow in-side, fragrant.
Flowering: August-November.
Planted in gardens, public parks and colleges.

Athar 566, Government Polytechnic.


Holarrhena antidysenterica (Linn.) Wall.

A. Flowering twig, B. Flower, C. Stamens, and D. Pistil.
Holarrhena antidysenterica (Linn.) Wall.
Flowering: August-November.

Common, Often planted in parks, schools and private gardens.

Ather 572, Agri House.

2. Holarrhena A.Br.


Verum antidysentericum Linn. Sp. fil. 209, 1753.

A medium sized, deciduous tree. Bark rough, brown. Younger parts often pubescent. Leaves elliptic-oblong, subcoriaceous, subsessile, 10-16 nerved. Flowers white, in terminal sessile, cyme corymb, pedicelled. Stamen 0, at the base of corolla tube; anthers sacronate. Fruit a white dotted, divaricate, double follicle.

Flowering & Fruiting: May-November.

Rare. In this area this plant is cultivated, but in the nearby forest tracts it is wild and common.

Ather 637, Chandak.

3. Thevetia Linn., nom. cons.


A small evergreen tree. Leaves linear, lanceolate, sessile, sub-coriaceous, glabrous, green; lateral nerves not prominent. Flowers in terminal cymes, yellow. Corolla campanulate, limb much longer than the tube; throat with 5-hairy scales. Fruit a depressed-globose, angular drupe, green when young and black when ripe.

Flowering & Fruiting: Practically round the year.

Common, planted on road sides.

Athar 666, Near Exhibition Ground.

4. *Ichnocarpus* R.Br.


A twining evergreen, branched shrub; inflorescences and abaxial surface of the leaves ferruginous. Leaves elliptic-oblong or ovate-lanceolate, acute or acuminate, dark-shining-green above and rusty beneath; main lateral nerves 4-5 pairs. Flowers white, fragrant in dense cymes. Calyx rusty, minutely glandular inside; sepals ovate, acute and fused half way. Corolla salver shaped, lobes ovate-lanceolate, twisted, swollen round the included anthers, hairy on upper surface. Stamens 5; anthers sagittate, connivent above and adherent to stigma. Disk lobed; lobes longer than the hairy ovary, tips of the lobes swollen. Fruits paired follicles, rusty.

Flowering & Fruiting: August-May.

Common, often found climbing on *Flaccourtia, Azumphus* and *Palmaria*.

Athar 186, Vidur Kuti Road.
5. *Vallaris* Burn.


A large, glaucous, twining shrub. *Leaves* opposite, *oblong-lanceolate,* glabrous, *punctate.* *Flowers* white in *axillary,* dichotomous *cymes.*

*Stamens* 5, forming a cone; each *anther* with *globose* gland at the back. *Fruit* not seen.

*Flowering:* Summer and rainy season.

*Athar 317,* Bhatan.


**Key to species:**

Nearly glabrous; *leaves* obtuse; *calyx*

divided half way down; *berry* usually

4-seeded ................................................ 1. *C. congesta*

Branches pubescent or glabrous; *calyx*

divided upto base; *berry* 2-seeded .......... 2. *C. spinarum*


*Carissa carandas* auct. (non *Linn.)*, *K.Bl.* 3:630, 1882 (proper);

A large spreading shrub, branches armed with simple, straight spines. Leaves ovate-oblong, glabrous, shining. Flowers white or tinged with red in terminal, corymbose cymes. Fruits ellipsoid berry, cream white with red shade when raw and purple-black when mature. Seeds peltate, usually 4. This plant has a very sticky white latex which is particularly troublesome at the time of picking of berries.

Flowering & Fruiting: April-December.

Common, generally planted as a hedge and for the sake of berries which are made into pickle and jam etc.

Ather 550, Mai Dasti, Bijnor.

Carissa opaca Stepl. ex Haines in Ind. For. 47:378, 1921; Parker, For. Fl. of Punjab ed. 2:330, 1924.

This is a wild species and differs from the preceding species in having more or less pubescent branches; acute leaves; forked spines (which often bear leaves) and 2 seeded berry.

Flowering & Fruiting: March-December.

Common, on road sides, near the villages.

Ather 247, Mohammadpur.

7. Tabernaemontana Linn.

Tabernaemontana divaricata (Linn.)N.Bl. in Roem. & Schult. Syst. 4:427, 1819; Fl. 136, 1978.

**Ervatamia divericata** (Linn.) Burkhill in Rec. Bot. Surv. Ind. 10:320, 1925.


A medium sized glaucescent shrub. Leaves oblong to lanceolate, entire, undulate, acute or acuminate; stipules cupular; adaxial surface shining. Flowers white in terminal, peduncled cymes, pure white, fragrant at night. Corolla pure white, with yellow centre. Fruit not seen.

Flowering: April-October.

Commonly planted in houses, parks and government offices.

Athanar 654, District Hospital.

8. **Catharanthus** G. Don.

Key to species:

Stem acutely quadrangular; leaves lanceolate, acute; flowers white .................... 1. *C. pusillus*

Stem not acutely four angled; tinged with red at least basally; leaves ovate, obtuse, rounded; flowers white or rose ........ 2. *C. roseus*


Erect, glabrous branched or unbranched annual. Stem acutely 4-angled. Leaves opposite; stipules dissected; leaf surface glabrous, with transverse hayline markings (as seen under microscope); margins ciliate; apex acute; lateral nerves 3-6. Flowers solitary-axillary, short pedicelled, white. Calyx sepals 5, slightly connate at base; segments linear, acute, persistent. Corolla petals 5, cream coloured; throat with scales. Stamens 5, inserted near the throat; anthers acute, free from stigma. Ovaries black, longitudinally mucilaginous and longitudinally furrowed on one side.

Flowering & fruiting: Rainy season.

Commonly found on the thickets along road sides and waste-land etc.

Athar 154, near Bid Oah.


Vinca rosea Linn. Syst. (ed. 10). 944, 1759.


This species is under cultivation and can be easily distinguished from preceding species by obtusely angled, somewhat woody stem; obtuse or rounded leaves and pink or white flowers.

Commonly cultivated. This plant is hardy, easy to grow and does not require much care.
Flowering & Fruiting: April–December.

Ather 655, t. C.I. Godown.


*Nerium indicum* Hill. Gard. vict. n. 2. 1786.


*Nerium oleander* Blanco, Fl. Filip. 104, 1837; 75, 1845; 1:140, t. 47, 1877 (non Linn.).

A large, evergreen shrub with divaricate branches originating from the base. Leaves tenuate, shortly pedicillate, glabrous, dark green above; margin slightly revolute; apex acute. Flowers white or dark pink in terminal cymes. Fruits not seen.

Flowering: Nearly round the year.

Very commonly cultivated for the sake of attractive flowers.

Ather 649, from several places.
Key to genera:

Climbers.

Flowers purplish-blue, more than 1 cm across ........................................ 1. Cryptostegia

Flowers greenish-yellow, less than 1 cm across .......................................... 2. Leptadenia

Erect herbs.

Flowers white and purple; stem white tomentose ........................................ 3. Calotropis

Flowers orange-red; stem nearly glabrous .................................................... 4. Asclepias

1. Cryptostegia R. Br.


Nerium grandiflorum Hook. Fl. Ind. 2:100, 1824.


Flowering & Fruiting: Nearly round the year.

Cultivated as an ornamental.

Atha 490, Engineers' Hostel.
2. *Leptadenia* R.Br.


Flowering & Fruiting: June–January.

Often found among the hedges.

Athaar 153, Near Bid Gah.


Flowering & Fruiting: April–July.

Abundant in waste places, especially in sandy soil.

Athaar 179, Mandawar Road.
Calotropis procera (Willd.) Dry & ex W. Ait.
4. *Asclepias* Linn.


An erect mostly simple or branched herb; branching from the woody base, glabrous, younger parts hairy. Leaves lanceolate, glabrous, entire, acute or acuminate at apex, petiolated. Flowers in leaf-opposed or lateral long peduncled cymes; peduncles usually longer than the petiole, hairy. Calyx 3-lobed; lobes lanceolate. Corolla red, reflexed, lobes longer than the sepals, obtuse, corona scales orange. Follicles not seen.

Flowering & Fruiting: Cold season.

Cultivated as an ornamental.

Atzar 300, F..L. Inspection House.
Buddleja Linn.

Key to species:

Flowers white ........................................ 1. *B. asiatica*

Flowers orange ........................................ 2. *B. madagascariensis*


A white tomentose, perennial shrub. Leaves lanceolate-oblong, acute or rounded at base, acuminate at apex, dark-green above, white tomentose beneath. Flowers in spiciform, densely tomentose, drooping panicles, shortly pedicelled. Calyx white tomentose; lobes acute. Petals white, longer than the sepal, hairy cut side. Fruit ellipsoid.

Flowering & Fruiting: February-May.

Often planted in gardens.

Athal 310, Vijay Bhavan.


Readily distinguishable from *B. asiatica* by its ovate-oblong leaves and orange flowers.

Flowering & Fruiting: January-April.

Planted in gardens.

Athal 303, Industrial Estate.
Mitreola Linn.


*Cphiorniza mitreola* Linn. Sp. Pl. 150, 1753.


*Mitreola paniculata* Hall. ex G. Don, Gen. Syst. 4:171, 1837.


Erect, slender, branched herb, branching from above the base. Leaves shortly petiolate, entire, glabrous, acute. Flowers sessile in dichotomous, second cymes. Corolla white, lobes oblong, obtuse, with a ring of hair inside. Fruit 2-horned capsule.

Plants associated: *Chrysanthellum americanum, Lindernia multiflora, Alysicarpus bupleurifolius, Heteropogon contortus*.

Flowering & fruiting: August–December.

Rare, in shady grassy places.

Astar 364, Dharam Nagri.
Key to genera:

Floating herbs, flowers white .................. 1. Nymphoides

Terrestrial herbs.

Flower zygomorphic, greenish yellow ...... 2. Hopoea

Flower actinomorphic, pink-purple .......... 3. Centaurium

1. Nymphoides Hill

*Nymphoides indica* (Linn.) C. Kuntze in Rev. Gen. Pl. 429, 1891;


Plants associated: *Vallisneria spiralis*, *Hippophae nasturtium-aquaticum*, etc.

Abundant in ponds and ditches.

Athar 300, Hemrajpur.
2. *Hepatica* Willd.


Flowering & fruiting: Winter season.

Plants associated: *Scirpus mucronatus*, *Alopecurus napalensis*, *Juncus* sp., *Centaurium pulchellum*, *Asphodelus tenuifolius*, *Trifolium* sp.

Occasionally found in marshy situations.

Athus 751, Hemrajpur.

3. *Centaurium* Hill.


*Centiana pulchella* Sw. Vet.-Ak. Handl. Stockh. 86. pl. 3. f. 8-9, 1783.


Erect annual herb, branching from upper part. Lower leaves broader upper once narrower, sessile, lateral nerves obscure on upper face, entire. Flowers in leafy cymose panicles; sessile, flower in the dichotomy pedicelled. Calyx lobes linear. Style lobes hairy.

Confined to the areas near Cangra.

Flowering & fruiting: Winter season.

Athar £25, Khali Chat.
Phlox Linn.


Erect, glandular hairy herb; stem simple or branched. Leaves sessile, lower opposite, upper alternate; base semiamplexicaul; entire, obtuse or acute. Flowers in corymbose cymes, pedicelled. Calyx lobes tipped with a short awn. Corolla variously coloured. **Stamens 5**, inserted at unequal heights on the corolla tube.

Flowering & Fruiting: Winter season.

Grown as a winter annual. Usually the corolla lobes are crenulate in this plant but a variety with fimbriate petals is also under cultivation.

Athar 511, from several places.
Key to genera:

Trees or large shrubs.

Ovary 4-celled; ovule 1 in each cell;
styles 4 due to the bifurcation of
primary style arms

1. *Cordia*

Ovary 2-celled; ovules 2 in each
cell; styles 2 (primary style arms
undivided)

2. *Ehretia*

Herbs.

Flowers yellow; root red

3. *Arnebia*

Flowers not yellow; root colourless.

Corolla tube without scales in the
throat (sometimes throat with
slight intrusion of the sinuses of
corolla tube in *Irishodeema*).

4. *Heliotropium*

Flowers white, small, in
terminal dichotomous scorpioid
cymes; anthers not forming a
cone, the tips of connectives
not excurrent; leaves linear

5. *Irishodeema*
Corolla tube with scales in the throat.

Erect herbs; leaves oblong
lanceolate; nutlets more or
less glochidiate on the back ..... 6. Cynoglossum

Prostrate herbs; leaves
oblong, spatulate, or
lanceolate; nutlets granular,
scabrid on the back .............. 7. Bothriospermum

1. Cordia Linn.


Cordia obliqua Willd. Phytogr. 4, t. 4, 1794; FDI. 4:137, 1888.

Cordia myxa auct. pl. (non Linn.)

A medium sized tree; bark grey to brown, fissures longitudinal. Leaves
upper surface glabrous to scabrous, lower pubescent especially when
young; broadly ovate to elliptic-oblong or sub-orbicular, serrate,
base cordate or somewhat cuneate. Flowers in axillary and terminal
cymes, white, shortly pedicelled, polygamous. Calyx glabrous outside,
pubescent within Corolla equalling the calyx tube; lobes narrow,
oblance, obtuse, recurved. Stamens exerted; filaments hairy below.
Drupes ovoid, apiculate, yellow, pink.

Flowering & Fruiting: March-August.

Commonly planted in houses, near villages.

Athan 668, Shakarpuri.
2. *Ehretia* Linn.

Key to species:

Leaves large, often unequal sided, elliptic or obovate; drupes almost two lobed, a tree ............................. 1. *E. laevis*

Leaves smaller, obovate, spatulate; drupes depressed, a shrub ................. 2. *E. aspera*

1. *Ehretia laevis* Roxb. Pl. Cor. 1:42, t. 56, 1796; Fl. Ind. 4:141, 1883;

A small tree with foliage not very dense; bark ashy-grey, smooth.

Leaves subcoriaceous, elliptic, obovate, entire, glabrous, dark green, peltate; main lateral nerves 6-10 pairs; younger leaves slightly rusty tomentose. Flowers white, subsessile in much branched, pubescent, axillary and terminal corymbose, peduncled, cymes, composed of unilateral, curved, spikes. Calyx pubescent internally as well as externally; lobes ovate, acute. Corolla rotate, pubescent, obtuse, oblong; filaments glabrous, slightly dilated near the base.

Flowering & Fruiting: March–June.

Common, near villages.

Ather 62, Adampur.

2. *Ehretia aspera* Roxb. Pl. Cor. 1:41, t. 55, 1796; Fl. Ind. 1:598;

*Ehretia obtusifolia* Hochst. Brand. For. r. 340; Ind. Tr. 481, Repr.
ed. 1971; Fl. 4:142, 1883.
Ehrisia leavis var. aspera Clarke in FBI, loc. cit.

An erect or spreading shrub, bark ashy grey and smooth, young parts with white and brown tomentum. Leaves long, obovate, spatulate or elliptic-oblanceolate, apex rounded-acuminate, main lateral nerves 4-6 pairs. Flowers white or bluish in dense apparently terminal cymes; peduncles hairy. Calyx hairy outside with few glandular hairs near the base. Corolla tube longer than calyx. Filaments slightly spreading outwardly. Fruit depressed globose, shortly beaked.

Flowering & Fruiting: March-October.

Not uncommon. Near the villages and in wastelands.

Ather 206, Bansajpur.

3. Amenia Forsk.

Amenia hispidissima (Sieb. ex Lohm.) DC. Prodr. 10:94, 1846; Fl. Ind. 4:176, 1883; Fl. Ind. 1:541, ed. 1960; Key. 173, 1978.


A diffuse, very hispid herb; hair bases red and bulbous. Stems many from a woody base. Leaves sessile, linear, lanceolate, subobtuse, entire, densely hispid on both surfaces but more so adaxially. Flowers in compact second racemes or spikes, bracts linear, hispid, single nerved. Calyx divided almost to the base, covered with long hispid hairs; segments unequal, acute. Corolla yellow, hairy outside, the tube is constricted in the middle. Stigmas 5; anthers long; filaments extremely short, there is an annulus of white hairs at the base of
stamens. **Style** bifid near the apex. **Styles** 2; stigma reniformy capitulate, papillose. This plant exhibits heterostyly very clearly. In short styled flowers the style is equal to the calyx tube and the stamens are inserted near the mouth of corolla tube, while in long styled flowers the style is equal to the corolla tube and the stamens are inserted below the middle of corolla tube. Shifting in the position of androecium is, most probably, helpful in checking self-pollination, at least, in later case.

Flowering & Fruiting: February–October.

Common, often found in sandy soil.

Ather 76, Christian’s Graveyard.

4. **Heliotropium** Linn.

**Key to species:**

Spike not conspicuously bracteate upward; leaves larger ........................................ 1. **H. strigosum**

Spires conspicuously bracteate throughout; leaves smaller .............................. 2. **H. parifolium**


**Heliotropium brevifolium** Wall. ex Roxb. Fl. Ind. 2:2, 1832.

A prostrate to decumbent, annual herb; branches spreading in all directions from the base; whole plant hispidly hairy. Leaves linear lanceolate, appressed hairy, single nerved. Flowers white, small, in bracteate, branched, second spikes. **Stamens** 5; anthers ovate, 2-celled; connective prolonged into a beak. **Fruit** ovoid, nutlets 4.
Flowering & Fruiting: February-October.

Abundant, found in waste places and on road sides; preferably in sandy soil.

Ather 113, Barrage Road.


Heliotropium marifolium var. wallichii Clarke in FDI, loc. cit.

Cynoglossum marifolium Retz. Fl. Ind. 1:457.

This species differs from the preceding species in having the spikes which are bracteate throughout and relatively larger leaves.

Flowering & Fruiting: Nearly throughout the year.

Abundant, both H. strigosum & H. marifolium grow mixed.

Ather 603, Barrage Road.

5. Trichodesma R. Br., nom. cons.

Trichodesma indicum (Linn.) R. Br. (Prodr. 496, 1810, Comb. inval.)
ex Lehm. Fl. Asperifol. 195, 1818; FDI. 4:153, 1883; FUGR. 1:539,

Barrago indica Linn. Sp. Pl. 137, 1753.

An annual erect or diffused herb; rough with appressed, multicellular, stiff, bulbous based hairs, young parts tinged with light red. Leaves mostly sessile, ovate oblong or lanceolate; base narrowed, cardate; upper surface clothed with stiff hairs, seated on flattened circular discs (the leaves when viewed against the light the discs appear opaque), lower surface nearly villous or quite glabrous except the
nerves and veins. Flowers pale-blue turning to pink or white. Calyx segments connate, except the apices; each segment keeled, acute, apex reflexed after anthesis; base cordate or hastate. Corolla lobes ovate, abruptly acuminate; centre with 5–6 brown spots which unite to form a ring. Anthers sessile; apices long, flat, pubescent at the base, all twisted together to form a rope like structure. Corolla tube 3-nerved below the anthers; anther bases also hairy.

Flowering & Fruiting: August–December.

Common, Crow in a variety of soil, prefers damp localities.

Ather 190, Khorki village.

6. Cynoglossum Linn.


An erect scabrous, strigose herb, lower part somewhat woody, appressed hispid. Leaves sessile, broadly lanceolate; nerves prominent abaxially; acute at both ends, dentate, appressed hairy with bulbous based hairs. Flowers white with a blue centre; in elongated, branched and panicked racemes. Corolla yellowish-white or white; segments ovate-oblong; throat scales bluish. Nutlets glochidiate.

Flowering & Fruiting: July–December.

Common, in wastelands, grasslands and on road sides.

Ather 441, Near Employment Exchange.
7. *Bothriespernum* Bunge


Flowering & Fruiting: Cold season.

Rare, occasionally found in dry, low lands.

Athar 468, Jeevan Sarai.
Key to genera:

Leafless total stem parasitic, yellow,
thread like herbs ........................................ 1. Cuscuta

Leaves fully developed, autotrophs.
Prostrate herbs, not climbers.

Leaves linear, hairy; flowers
pinkish-white, nearly sessile;
style one; stigmas 2 ....................... 2. Convolvulus

Leaves oblong orbicular, glabrous
or hairy (then flower blue); styles
2, distinct from the base .............. 3. Evolvulus

Climbers.

A large climber; abaxial surface of
leaves silvery tomentose; nerves
prominent; ovary 4-celled; fruit
mealy .................................................. 4. Argyreia

Small climbers, climbing on shrubs
or herbs; fruit dry.

Flowers in large axillary and
terminal panicles, white;
3 sepals enlarged in fruit .......... 5. Perana

Flowers axillary, not paniculate.

Stem winged; leaves entire;
sepals greatly enlarged in
fruit; fruit circumscissile .... 6. Operculina
Stem not winged.

Flower yellow .............. 7. Herrania

Flowers not yellow.

Corolla tube usually
uniformly enlarged
from the base, 5
bands on the lobes
rarely clear; pollen
not echinulate ........... 2. Convolvulus

Corolla tube not
uniformly enlarged
from the base, 5
bands on the lobes
clearly defined by
2-lines; pollen
echinulate ............. 8. Ipomoea

1. Cuscuta Linn.


Syn. nov.

A yellow or yellow green thread like herb. Leaves none or greatly reduced to just scales. Flowers sessile in racemously arranged clusters, bracteate. Calyx segments ovate, obtuse; nearly similar
to corolla. **Corolla** white, lobes ovate, triangular, reflexed, scaly inside; scales fimbriate. Ovary seated on a disc, when punctured a yellow brown viscous fluid oozes out from the disc.

**Flowering & Fruiting**: Rainy season.

Abundant. Commonly parasitizes on a variety of hosts.

**Athal 673**, **Vidur Kuti Road**.

2. **Convolvulus Linn.**

**Key to species:**

Hairy prostrate herb; leaves linear;

flowers sessile ........................................... 1. **C. microphyllus**

Glabrous, twining; leaves broad, hastate;

flowers distinctly pedicelled ....................... 2. **C. arvensis**

1. **Convolvulus microphyllus** Glob. ex Spreng. Syst. 1:611, 1825;

FBI. 4:218, 1883; Bole & Shah JENT. 58:1838, 1961; FEO. 175, 1978;


A prostrate or suberect herb; branches many, arising from a woody base, densely hairy. Leaves linear-lanceolate; very shortly petioled. Flowers solitary or in few flowered clusters. Sepals hairy, subequal. Corolla white or light pink, Fruit a glabrous capsule.

**Flowering & Fruiting**: Cold season.

Not uncommon. Occasionally found in sandy soil.

**Athal 219**, Railway embankment near Jhalu.

Readily distinguishable from preceding species by its twining habit; petioled, hastate leaves; pedicelled flowers and glabrous plant body.

**Flowering & Fruiting:** Winter season.

**Abundant.** Mainly in wheat fields.

Ather 89, Hemrajpur.


**Key to species:**

- Plant hairy; flowers blue .................. 1. *E. alscinoides*
- Plant glabrous; flowers white .............. 2. *E. nummularius*


**Convolvulus alscinoides** Linn. Sp. Pl. 157, 1753.


**Flowering & Fruiting:** Rainy and winter season.

**Common.** Often found on fallow land and road sides etc.

Ather 104, Eid Gah.


Can be easily distinguished from preceding species by glabrous plant body; white flowers and pedicel which is erect at first and becomes deflexed after anthesis.

**Flowering & Fruiting:** Summer and Rainy season.

Abundant. Grows in a variety of situations and soils.

Athan 721, Bijnor Inter College, Bijnor.

4. *Argyreia Lour.*


*Convolvulus nervosa* Durm. f. Fl. Ind. 40. t. 20. f. 1, 1763.


A robust twining shrub. Stem woody at base; younger portions densely, silvery, appressed hairy. Leaves ovate, cordate, densely silvery white hairy, especially abaxially. Flowers in few flowered cymes on long peduncles; bracts foliaceous. Corolla funnel shaped; purple in colour.

**Flowering & Fruiting:** August–June.

Cultivated. Often grown in gardens.

Athan 774, District Judge’s Court.
5. *Perana* Burm, f.

*Perana paniculata* Roxb. Pl. Cor. 3:31, 1819; FBL. 4:222, 1883;

A dextro-twining, perennial shrub. **Leaves** ovate-oblong; base
cordate, apex acuminate. **Flowers** in large, axillary and terminal
drooping panicles, small, white. **Calyx** deeply 5-lobed, pubescent;
3 of them enlarging in fruit. **Corolla** tubular, hairy out side.
**Stamens** 5, included. **Style** short, undivided. **Stigma** capitate.

**Flowering & Fruiting:** November-March.

Rare. Collected only once from Tajpur. Fairly common in Najibabad
and other forest tracts.

Athar 515, Tajpur.

6. *Operculina* S. Manso

*Operculina turpethum* (Linn.) S. Manso, Enum. Subst. Bras. 16. 19,

*Convolvulus turpethum* Linn. Sp. PI. 155, 1753.


A stout, twining herb with winged stem and milky latex. **Leaves**
distant, ovate or oblong, acute, entire; base cordate or truncate.
**Flowers** in few flowered cymes; bracteate, bracts oblong lanceolate,
pubescent. **Calyx** outer sepals pubescent; inner glabrous. **Corolla**
white. **Capsule** globose; enclosed in greatly enlarged pubescent,
calyx segments.
Flowering & Fruiting: Rainy and winter season.

Not uncommon. Often found near villages.

Athar 322, Rasht.

7. **Merremia** Dennst.


**Evolvulus hederacea** Burn. f. Fl. Ind. 77. t. 20. f. 2, 1768.


A annual twining herb. Stem branched, glabrous, sometimes rough due to tubercles. Leaves ovate, cordate; basal lobes rounded, entire or 3-lobed, acute or apiculate, glabrous; long pedicled. Flowers in axillary cymes; bracteate; shortly pedicelled; yellow in colour. Sepals truncate, apiculate or obscurely toothed; reflexed in fruit. Corolla campanulate, distinctly striate. Seeds trigonous, velvety.

Flowering & Fruiting: Rainy season.

Abundant. Often grows in road side ditches and climbs on bushes.

Athar 384, Hemrajpur Road.

8. **Ipomoea** Linn.

Key to species:

Plants with fleshy fusiform roots ............... 1. *I. batatas*
Plants without fleshy root stock.
Leaves pinnately or palmately, deeply lobed.

Leaves pinnately lobed, glabrous; flowers red, slender, tubular ........... 2. L. guamoclit

Leaves palmately lobed.

Plant hairy; flowers pink or white ........................................ 3. L. pes-tigridis

Plant glabrous; flowers violet, blue ..................................... 4. L. cairica

Leaves entire or shallowly lobed.

Plant aquatic or semi-aquatic; giving off black, fibrous roots from the nodes, prostrate; stem fistular, flowers pink ................................. 5. L. aquatica

Plant not aquatic, not rooting at the nodes.

Twiners or prostrate, herbaceous.

Leaves white woolly beneath, (sometimes deeply 3-lobed); stem with gland based hairs; sepals narrowly lanceolate, hairy; capsule somewhat hairy towards the apex ............ 6. L. arachnesperma
Leaves fulvous hairy on both the surfaces; stem without gland based hairs; 2-outer sepals broader; capsule glabrous .......................... 3. Ip. pes-tigrisida

Erect shrub, woody near the base; latex milky; flowers purple, pink .......................... 7. Ip. fistulosa


Convolvulus batatas Linn. Sp. Pl. 154, 1753.
A much branched, glabrous, creeping herb. Roots fusiform, brown, flesh white, sweet. Leaves ovate-cordate. Flowers not seen.

Flowering & Fruiting: Not seen.
An important crop plant, propagated by cuttings.

Atha 627, Ganj.


Convolvulus pennatus Deer. in Lamk. Encycl. 3:567, 1792.


A beautiful, dark green, slender, glabrous twining annual. Leaves pinnate; the segments linear, filiform. Flowers in 1-few flowered cymes. Sepals 5, basally connate, subequal, persistent in fruit. Corolla bright-red, tubular, narrowly funnel shaped; lobes, triangular. Seeds black; compressed; ellipsoidal.

Flowering & Fruiting: Rainy and winter season.

Not uncommon. Wild as well as cultivated.

Athar 526, Raja Ka Tajpur.


A hairy, twining herb; branched. Stem covered with spreading hairs. Leaves deeply 5-7 palmately lobed; lobes elliptic, lanceolate with sinuses between their bases; sometimes the leaf may be, 3-lobed or rarely entire; appressed hairy. Flowers pink or white in axillary cymes; bracteate. Calyx 5-lobed; 2-outer larger. Corolla funnel shaped, pink, rarely white. Seeds minutely hairy.

Flowering & Fruiting: September-December.

Abundant, in cultivated fields and among the hedges.

Athar 13, Near Meexan Shah.


*Convolvulus caeruleus* Linn. Syst. (ed. 10). 922, 1775; Clarke in HK. f. FBI. 4:214, 1883.
Ipomoea palma Forsk. Fl. Aegypt.-Arab. 43, 1775; FBI. 4:214, 1883.

A large glabrous perennial creeper. Leaves palmatifid into 5 segments; basal pair of segments again lobed or parted. Flowers usually 1-3 in axillary peduncles. Corolla purple, funnel shaped. Capsule subglobose or ovoid smooth; 4-seeded.

Flowering & Fruiting: Throughout the year.

Common. Usually planted in colonies to cover up the fencing.


An aquatic or marshy herb; rooting at the nodes, roots appear black after drying. Stem fistular, reddish or brownish. Leaves elliptic-oblong; cordate hastate at base, acute, long petioled. Flowers axillary, 1-5 in cymes. Corolla pink to purple with a dark centre. Seeds triangular with a distinct scar.

Flowering & Fruiting: Rainy season and winter season.

Commonly found in the ponds and on their edges.

Ather 29, Hemrajpur.

Ipomoea pilosa Sweet, Hort. Brit. 269, 1827; FBI. 4:213, 1883; 

An annual, twining, hirsute herb. Stem woody at the base. Leaves often with 2-3 triangular lobes, ovate-cordate, silvery white below, hairy above with bulbous base hair, petiolated. Flowers in few flowered axillary cymes. Sepals 5, linear-lanceolate, hirsute. 

Flowering & Fruiting: Rainy and winter season.

Common in Sugarcane fields.

Athar 360, Najibabad Road.

7. Ipomoea fistulosa Mart. ex Choisy in DC. Prodr. 9:349, 1845 
(Jan.); Van Costeitr. in Fl. Males.(Ser. 1). 4:509, 1954; Backer & 

Ipomoea crassicaulis (Benth.) Robinson, in Proc. Amer. Acad. Arts & 
Sci. 51:530, 1916; Costeitr. in Blumea 3:569, 1940 & Fl. Males.(1)4: 


Ipomoea carnea auct. non. Jacq.

This species can be readily distinguished from other species of 
Ipomoea by its erect or ascending habit; milky latex, woody base; 
ovate-cordate leaves with slightly wavy margins and long petioles; 
large pink or purplish flowers in many flowered axillary and 
terminal cymes.
Flowering & Fruiting: Round the year.

Abundant, often used for hedging and fencing purposes, also found as escape.

Athar 381, Bakhshi Wala.
LXXII. SOLANACEAE

Key to genera:

Corolla tube elongated.

Viscidly hairy herbs; fruit a capsule.

Capsule not spinous or tubercled.

Flowers solitary ...................... 1. Petunia

Flowers clustered ..................... 2. Nicotiana

Capsule spinous or tubercled ............ 3. Latura

Glabrous shrubs; fruit a berry ............ 4. Castrum

Corolla tube short, expanded.

Berry enclosed within the calyx.

Calyx not inflated; berry red,

sessile ..................................... 5. Physalio

Calyx inflated; berry yellow-orange, distinctly pedicelled ........ 6. Physalis

Berry not enclosed within the calyx.

Calyx reflexed in the fruit;

flowers yellow ......................... 7. Lycopersicon

Calyx reflexed or not, flowers not yellow.

Berry mostly elongated and
pointed, with a pungent smell
and taste, ripe berry not
filled with juice ..................... 8. Capsicum

Berry globose, smell or taste not pungent, ripe berry filled
with semifluid juice .................. 9. Solanum
1. **Petunia Juss.**


Lacte or ascending, viscid annual. Stem terete, simple or branched. Leaves sessile, elliptic-lanceolate or obovate, with a cuneate decurrent base, acute-obtuse, the leaf size reduces from base to the top. Flowers variously coloured, white, red, pink, violet or blotched. Corolla lobes 5, rounded, unequal, glandular hairy. Fruit a dehiscent capsule. Seeds many.

Flowering & fruiting: March-May.

According to Bailey (1949) and Dabu (1977) this species is a hybrid between *P. axillaris* (Lamk.) Britton, Stern & Poggenb. and *P. integrifolia* (Lodd.) Schinz and Tholl.

A very common and hardy annual, largely cultivated in public parks and colleges. Does not need much care.

Ather 632, B.I.C. Ujjnor.

2. **Nicotiana Linn.**

Key to species:

Anthers sub sessile, a road side weed .......... 1. *N. plumbaginifolia*

Anthers with long filaments, a cultivated crop plant ................................................. 2. *N. tabacum*

1935; Goodspeed et al. Chron. Bot. 16(1/6):403, 1954; Suppl. nUGP.


Plants associated: Sida cordifolia, Eclipta prostrata, Alternanthera sessilis, Sphagneticola tinctoria, Boechodeum engyptium, etc.

Flowering & Fruiting: October-December & March-May.

A very common road-side weed.

Athar 38, Bukhara, Bijnor.


This is a cultivated species and can be distinguished from the preceding species by its thicker and woody stem; larger leaves; yellowish flowers and stamens with long filaments.

Its cultivation is subject to the permission of Excise Department.

Athar 243, Neerpur.

3. Datura Linn.

Key to species:
Calyx angular; fruit dehiscence by
4-regular valves ...................................... 1. D. stramonium
Calyx suberect; fruit dehiscence
irregular .................................................. 2. D. metal

1. Datura stramonium Linn. Sp. Pl. 179, 1753; FtBl. 4:242, 1883 (incl.
var. tatula Clarke); FUSI. 2:18, Repr. ed. 1960; Safford, Journ. Wash.
Acad. Sci. 11:173-189, 1921; DeSoll F. Baileya 4:17, 1956; Satina &

Datura tatula Linn. Sp. Pl. ed. 2. 256, 1762; FUSI. 2:18, Repr. ed.
1960.

Datura inernia Jacq. Hort. Vindob. 3:44, t. 82, 1776.

An erect branched annual; stem glabrous or puberulous on younger
parts. Leaf long petiolated, entire, acute, base unequal sided. Flowers
long, on stout pedicels. Calyx 5-angled, green. Corolla white or
purple; lobes shortly acuminate. Fruits covered with long prickles.

Plants associated: Abutilon indicum, Solanum nigrum, Alumea sp.,
Cestria verticillata.

Flowering & Fruiting: September-June.

Not uncommon, found on wastelands.

Athar 598, Jotiyam, Bijnor.

2. Datura metal Linn. Sp. Pl. 179, 1753 (non. auct. pl. Ind. Pl.);

Datura alba Nees, Trans. Linn. Soc. Lond. 17:173, 1837; FUSI. 219,
384


Lunaria fastuosa Linn. Syst. Nat. ed. 10. 932, 1759; FBL. 4:242, 1883;


Plants associated: Aethionema cornifera, Cardiospermum halicacabum, Verbena officinalis, Saccharum sp.

Rare. I have collected this plant only twice, once from Hemrajpur (within the area of this thesis) and once from Rajibabad (outside this area), but on both occasions I found it growing near water.

Athar 217, Hemrajpur Colony.

4. Geastrum Linn.

Key to species:

Flowers opening at night; leaves broadly ovate, obtuse; corolla lobes erect ............ 1. G. nocturnum

Flowers opening in the day; leaves narrowly oblanceolate; corolla lobes reflexed .................. 2. G. parqui

Cestrum parqui L'Herit.
A profusely branched, large shrub, dark green. Leaves petiolate, glabrous, broadly ovate to oblong, acute, cuneate. Flowers greenish-yellow in axillary and terminal, much branched cymes. Corolla lobes erect at full anthesis. Fruit a purple-black, many seeded berry.

Flowering: Mostly in rainy season.
Fruiting: Winter season.

Common. Cultivated in houses and gardens for its fragrant flowers. The flowers emit a strong fragrance at night.

Ather 505, Nai Basti, Bijnor.


differs from the preceding species in having oblong-lanceolate leaves. Flowers creamy, nearly sessile in axillary, long peduncled, umbellate cymes. Corolla reflexed at full anthesis. Seeds compressed, one face with a depression.

Flowering & Fruiting: June-January.

Cultivated for ornamental purpose.

Ather 544, Nai Basti, Bijnor.


Physalis annifera Linn. Sp. Pl. 182, 1753.

Physalis annifera Link, noyl. Ill. 279.

Physalis flexuosa Linn. Sp. Pl. 182, 1753.
Withania somnifera (Linn.) Dunal
Withania somnifera (Linn.) Dunal

A. Flowering branch, B. Flower, C. Stamens with petals, D. Pistil, and E. Candelabra hairs.
Withania somnifera (Linn.) Dunal
An erect branched under shrub, nearly all parts covered with candelabra hair; branches flexuous, terete, densely tomentose. Leaves petiolate, elliptic-ovate, subacute; base acute usually unequal; main lateral nerves 9-7 pairs. Flowers greenish, about 5-6 together in subsessile, umbelliferous cymes; pedicel short. Calyx five toothed, tomentose outside and glabrous inside, capitate in flowers but urceolate in fruit. Corolla 5-toothed; outer upper part hairy rest glabrous; there are 5 cushion like hairy structures alternating with the petals and the stamens are inserted thereon. Anthers some times hairy. Fruit globose, red when ripe, glabrous.

Flowering & Fruiting: Nearly throughout the year.

Quite common in dry localities.

Ather 02, Henraspur.

6. Physalis Linna.

Key to species:

Anthers yellow.

Fruiting calyx 5-ribbed; corolla

small .......................... 1. P. micrantha

Fruiting calyx not 5-ribbed; corolla

larger .......................... 2. P. minima

Anthers blue, violet .......................... 3. P. angulata


Erect, sometimes unbranched herb. Stem angular, glabrous. Leaves ovate, cuneate, acute, petiolate, glabrous. Flowers solitary, nodding,
pedicel elongating in the fruit. Corolla pale-yellow. Stamens with filaments hairy at the base. Fruit yellow, berry, enclosed inside the inflated calyx.

Flowering & Fruiting: July–December.

Cannon. Mostly in shady places, sugar cane fields.

Atheros 151, Hennajpur Colony.


Distinguishable from above species by purple tinted stem, larger flowers and distinctly 5-ribbed fruiting calyx, filaments glabrous.

Flowering & Fruiting: Same as in P. micrantha.

Atheros 201, Sandowar.


Distinguishable from two preceding taxa by 5-small, brown spots inside the corolla and blue-violet anthers.

Flowering & Fruiting: March–December.

Atheros 99, Khorki.

7. Lycopersicon Mill.


**Solanum lycopersicum** Linn. Sp. Pl. 185, 1753.

Drept, decumbent or ascending strongly odoriferous herb. Stem obtusely angled, glandular hairy. Leaves 1-2 pinnatifid or parted, segments ovate-lanceolate, cuneate, rounded at the base, irregularly dentate. Flowers yellow, in 3-many flowered cymes, nodding. Calyx glandular, segments lanceolate. Corolla segments lanceolate. Fruit globose, smooth or grooved, red when ripe.

Flowering & Fruiting: Cold season.

Cultivated. Abundantly found as an escape along the drainage.

Athar 016, Arya Nagar.

A species of tomato which, I suppose, should be **Lycopersicon pimpinellifolium** Mill. is grown as an ornamental pot plant.

The correct name of Tomato has long been a matter of much discussion. I have followed Terrell (loc. cit.) and adopted **Lycopersicon esculentum** Mill. as correct name for Tomato.

0. *Capsicum* Linn.


An important economic crop, cultivated for the sake of fruits (Chillies).
Flowering & Fruiting: Summer and rainy seasons.

Ather 301, Qasipura.


Key to species:

A tuberous herb ........................................ 1. *S. tuberosum*

Non-tuberous, herbs or shrubs.

Unarmed plants.

A small tree with violet flowers ..... 2. *S. grandiflorum*

Herbs or shrubs with white flowers.

Densely tomentose large herb ..... 3. *S. erianthum*

Glabrous small herb; flowers

occasionally with purple tinge ... 4. *S. nigrum*

Armed plants.

A prostrate herb with violet

flowers .............................................. 5. *S. surattense*

 Erect herbs or shrubs; bisexual and

male flowers on the same plant;

berry dull yellow ......................... 6. *S. incanum*


An ascending herb with underground stolons, which bear tubers at
their ends. Tubers vary in size, skin thickness and colour from
variety to variety. Leaves imparipinnate, pairs of smaller and
larger leaflets alternating each other. Flowering not seen.

An important vegetable crop.
Atthar 426, Kherki.


A small soft wood tree; younger parts sticky, sparsely thorny.

Leaves large, broadly ovate, sinuate lobed, stellately hairy, with few prickles along the nerves. Flowers violet with white blotches.

Fruit a globose berry.

Flowering & Fruiting: Throughout the year.

Planted as an ornamental.

Atthar 473, C.R. Inspection House.


An erect, large shrub, soft woodeed, densely tomentose; tomentum stellate. Leaves large, ovate, oblong, acute, cuneate, peltate, mostly entire, may be shallowly sinuate. Flowers nodding, in many flowered, corymbose cymes, dirty white. Calyx densely tomentose.

Corolla white, stellate hairy outside. Fruit not seen.

Plants associated: *Calebrookea oppositifolia*, *Porana paniculata*, *Vitis negundo* etc.

Flowering & Fruiting: Rainy and winter seasons.

Rare. Sometimes found among thick vegetation, common in nearby forest tracts (outside the area of this thesis).
Ather 438, Jalalpur.


An erect, glabrous, glaucous herb. Stem often tinged with purple. Leaves petiolate, cuneate, sinuate or entire, acute. Flowers in extra-axillary few flowered cymes. Corolla white, sometimes purple tinged. Stamens forming a cone; anthers yellow, dehiscence apical. Berry red to violet.

The morphology of this taxon varies to a great extent, depending on the ploidy. Hence, it is called as "*Solanum nigrum Complex*.

**Flowering & Fruiting:** Throughout the year.

A very common weed.

Ather 395, Bijnor.


Handily identifiable by its prostrate habit, long yellow spines all over the plant body; subpinnatifid leaves; violet flowers; berry globose, yellow with white streaks.

**Flowering & Fruiting:** Greater part of the year.

Abundant. Prefers sandy soil.

Ather 309, Rawli Ghat.

Solanum coagulans Forsk. Fl. Aegypt.-Arab. 46; FBI. 4:236.

Solanum melongena Censu Clarke FBI. 4:239, 1883 (pro parte).

Distinguishable from preceding species by presence of hairs, erect habit; leaves sinuato lobed, presence of male and bisexual flowers on the same plant; berry yellow.

Flowering & Fruiting: January–June.


Ather 270, Kundawa.
LXXIII- SPOPHULARIACEAE

Key to genera:

All sepals not similar; two linear and three broad.

Flowers yellow; leaves ovate, turning black on drying, not pellucid punctato ... 1. *Adenosma*

Flowers bluish; leaves not turning black on drying, succulent, pellucid punctate ........................................ 2. *Bacopa*

All sepals nearly similar.

Flowers yellow.

Corolla rotate; filaments bearded; plants with pungent smell and radical leaves ......................... 3. *Verbascum*

Corolla bilabiate.

Whole plant hairy; capsule not opening by apical pores; leaves ovate; always growing on walls ... 4. *Lindenbergia*

Whole plant glabrous except upper part; leaves narrow; capsule opening by apical pores; cultivated ......................... 5. *Antirrhinum*

Flowers otherwise.

Corolla rotate.

Corolla throat not bearded;
fruit two lobed ..................... 6. *Veronica*
Corolla throat bearded; fruit
globose, ovoid .......................... 7. Scoparia
Corolla bilabiate.
Marshy or aquatic herbs with
dimorphic leaves .......................... 8. Limnophila
Plants not marshy (same species
of Lindernia grow in paddy
fields, but they do not have
dimorphic leaves).

Fertile stamens 2.
Leaves small, glabrous;
capsule valves 2 partite .. 9. Hepatium
Leaves well developed;
capsule entire ............. 10. Lindernia

Fertile stamens 4.
Plant non parasitic, non
scabrid.
Leaves radical,
spathulate; lower
lip of the corolla
yellow streaked
inside; capsule
loculicidal .......... 11. Mazus
Leaves all cauline,
linear; corolla
purplish-red or
white; capsule
opening by pores ...... 5. Antirrhinum
Plants partially parasitic, scabrid, turning blue black on drying; flowers white

1. Adenosa Br.


Herpestes javanicus Blume Bijd. 745.

Adenosa ovata Benth. ex Rk. f. in Gen. Fl. 2:1949; FDI. 4:263, 1894.

Herpestes ovata Benth. Scroph. Ind. 30 and in Wall. Cat. 3696.

Pterostigma ovatum Benth. in DC. Prodr. 10:380; Miquel Fl. Ind. Bat. 2:1678.

A prostrate herb, branching in all directions, turns black when dry. Leaves opposite in unequal pairs; petiole very short; elliptic-ovate, serrate, acute, base cuneate. Flowers solitary axillary, pedicelled; pedical equal to or longer than the corresponding leaf, elongating with the fruit maturation. Sepals five, 3 outer large, foliaceous, with a distinct midrib and few lateral parallel nerves; 2 inner linear; persistent, accrescent. Petals yellow, bilabiate, slightly longer than the sepals. Stamens 4, didynamous; filaments slightly dilated at the base. Stigma with a shallow notch. Capsule septicidal. Seeds pale brown, with dark brown reticulation.

Plants associated: Acippe nasturtium-aquaticum, Eriogon asteroides etc.

Flowering & Fruiting: February–March; March–April.

Athal 378, Madhya Ganga Barrage.


*Lysimachia monnieri* Linn. Cent. Pl. 2:9, 1756 (1755).


*Cratoxylon monnieri* Linn. Syst. Nat. ed. 10. 851, 1759.


*Bacopa monnieri* (Linn.) Levet. Pflanzensam. 4. 3b:76, 1891.


Plants associated: *Ludwigia ascendens*, *Alternanthera sessilis*, *Numex dentatus*, *Polygonum sp.*, *Panicum proliferum*.

Flowering & Fruiting: Rainy and winter season.

Not uncommon, often found near water bodies.

Athen 567, Jalalpur.

3. *Verbasium Linn.*

**Scrophularia chinensis** Linn. Mant. 2:250, 1771.


An erect, annual, pubescent herb; hairs not glandular. Lower leaves petiolated, crowded, lyrate, pinnatifid; the large terminal lobe usually oblong, gland doted. Cauline leaves sessile, irregularly serrate, acute. Flowers pedicelled; in simple or branched racemes, which contribute to nearly half of the plant's length; bracts leafy, sessile with cordate base and serrate margins, hairy, longer than the pedicel. Calyx shorter than the pedicel, deeply divided, segments linear-oblong, hairy, entire, subacute, hairs of two types, longer simple and shorter glandular; gland doted, Corolla yellow and glandular hairy outside, subrotate. Stamens 4; anther reniform; filaments bearded with white glandular hairs.

Flowering & fructing: Summer season.

Common on waste-land and sandy river beds.

Atheer 71, Londawar.

4. **Lindenbergia** Lehm.


**Loddartia indica** Linn. Sp. Pl. 633, 1753.

**Stenosia ruderalis** Metz. Observ. Bot. 5:25, 1789.

**Lindenbergia ruderalis** (Metz.) Voigt, Hert. Suburb. Calc. 501, 1845.
Lindenbergia indica (Linn.) O. Kuntze

A. A flowering branch, B. Flower in lateral view,
C. Corolla cut open, and D. Gynoeccium.
Lindenbergia indica (Linn.) O Kuntze
Lindenberga urticifolia Lehm. in Link & Otto, Ind. Sem. Hort.
Berol. 5, 1829 (1830); FBI. 4:261, 1884; iUlt. 2:33, repr. ed. 1960.
Lindenberga polyantha Royce ex Benth. Scroph. Ind. 22, 1835; FBI.

Annual, more or less hairy herb, gland pubescent; branching from the
base. Stem ascending. Leaves broadly ovate, crenate-serrate (only in
upper half), basal half entire); base obtuse; glandular, pubescent
on both surfaces. Flowers in unilateral racemes, shortly pedicelled.
Calyx 5-nerved, densely villous (both within and without), lobes
triangular, oblong, obtuse. Corolla small, yellow, two lipped; upper
lip notched and inner in the bud; lower lip plicate transversely, the
folds glandular hairy; there are also two longitudinal rows of yellow
glandular hairs; tinged with red. Stamens 4, didynamous; anther lobes
separate. In at least two stamens the anther lobes are on unequal
heights.

Flowering & fruiting: Rainy season and winter.
Common, found on the old building walls. I have never seen it growing
on the ground.

Ather 59, Hai Basti.

5. Antirrhinum Linn.

Key to species:
Leaves narrow, less than 0.5 cm broad;
flowers pinkish-white, small; growing wild ... 1. A. orontium
Leaves broad, more than 0.5 cm broad; flowers
large variously coloured; cultivated ............ 2. A. majus

A medium sized herb, simple or branching from the base, more or less glandular hairy above. **Leaves** narrow, linear, subsessile, entire, acute; tip hairy; margins revolute; lower opposite, upper alternate, flowers solitary axillary, passing into terminal racemes; white, purplish. **Calyx** with five segments, posterior segment is the largest and anterior two are smallest, hairy with simple and gland tipped hairs. **Corolla** two lipped, glandular hairy, lower lip sacate at the base and with yellow hair inside. **Steranes** 4, didymous; filaments glandular hairy at the base. **Lavry** densely gland pubescent.

Plants associated: *Erhagonium triflorum*, *Trigonella corniculata*, *Cidenlandia corymbosa*, *Vernonia cinerea* and *Lataria* sp., etc.

**Flowering & Fruiting**: January-April.

Abundant on road sides and fields.

Ather 58, Jain Farm.


Distinguishable from preceding species by larger size, broader leaves and large multicoloured flowers.

Cultivated as winter annual.
6. Veronica Linn.

Key to species:


Erect, somewhat fleshy; leaves oblong; flowers in axillary and terminal racemes; plants grow near water and usually turn red after fruit ripening.


Easily distinguishable from preceding species by prostrate habit; smaller, serrate dentate leaves and solitary axillary flowers.

Common, on road sides and in fields.
Flowering & Fruiting: December-April.

Athar 45, Kherki.

7. Scoparia Linn.

_Scoparia dulcis_ Linn. - _Phyt. Pl. 116, 1753; FBI. 4:289, 1684; FUGR.

Erect branched, shrubby herb. Stem ribbed. Leaves oblong-ovate, crenate-serrate; petiolate; pollucid punctate on lower surface.

Flowers 1-4 in the axile of upper leaves, white. Sepals 4. Corolla expanded with bearded throat.

Flowering & Fruiting: Practically throughout the year.

Often found on waste-lands, old building walls etc.

Athar 116, Exhibition ground.


_Hottonia indica_ Linn. - _Syst. Nat. ed. 10:919, 1759.


Erect or ascending herb, with terpentine smell; lower nodes rooting. Leaves slightly succulent, punctate, ovate, dentate, obtuse, sessile; lower leaves dissected; only one lateral nerve prominent. Epicalyx

Plants associated: Lindernia parviflora, Sphenoclea zeylanica, Lttelina aismoides etc.

Flowering & fruiting: Winter season.

Not uncommon. Found near the ditches or submerged in water.

Athal 407, Juzafar Nagar Road.

9. Dopatrium Buch.-Ham. ex Benth.


Crotiola juncce Pl. Cor. 2:16, t. 129, 1798.

Small, erect, simple annual, glabrous. Leaves sessile, elliptic oblong, obtuse; size reduces towards the apex. Flowers perfect (pedicelled) as well as cleistogamous (sessile). Corolla pinkish violet. Fruit ovoid, subglobose, with persistent style base.

Flowering & fruiting: Rainy season.

Common in rice fields.

Athal 331, Mahimpur.

10. Lindernia All.

Key to species:

Fertile stamens 2.
Capsule linear.

Leaves sharply serrate ....................... 1. *L. ciliata*

Leaves coarsely dentate, lower

almost entire .............................. 2. *L. antipoda*

Capsule ellipsoid ............................ 3. *L. parviflora*

Fertile stamens 4.

Flowers in racemes ........................... 4. *L. multiflora*

Flowers solitary axillary ..................... 5. *L. crustacea*


A small, simple or branched annual. Leaves sessile, oblong or obovate, acutely densely serrate. Flowers in 5-15 flowered racemes, pedicellate. Corolla pink with red dots. Capsule linear.

Common in agricultural fields,

Flowering & fruiting: July-November.

Ather 457, Pedi.

Ruellia antipoda Linn. Sp. Pl. 635, 1753; pro maj. parte.


Distinguishable from preceding species by larger size, coarsely and distantly dentate leaves; corolla bluish.

Flowering & Fruiting: Rainy season.

Common. In road side ditches.

Ather 256, Kherki.


Gratiola parviflora Hoch. Pl. Cor. 3:3. t. 203, 1819.

Ilysanthes parviflora (Hochb.) Benth. in DC. Prodr. 10:419, 1846;
Bl. 4:283, 1884; Phyt. 2:25, repr. ed. 1960.

Ascending, branched, glabrous, herb; stem rooting below, 4-angled.

Leaves sessile, ovate-lanceolate, 3-nerved, lower larger, higher ones smaller. Flowers long pedicelled, solitary axillary. Corolla white.

Stamens 2, staminodes 2, dentate.

Flowering & Fruiting: September-March.

Marshy and other damp places.

Ather 408, Muzaffar Nagar road.


A branched, flaccid annual. Stem 4-angled. Leaves subsessile or petiolate, ovate, acute or obtuse; subcordate or truncate, glandular. Flowers in terminal racemes, pedicellate. *Corolla* white, upper lip brown, fertile stamens 4.

Flowering & Fruiting: Rainy season.

Habo. Occasionally found in shady situations.

Athar 451, Near Madhya Ganga Barrage.


*Capraria crustacea* Linn. Mant. 87, 1767.


Flowering & Fruiting: August–November.
Mazus pumilus (Burm. f.) Van Steenis

A. Complete plant, B. A bud, C. Corolla cut open to show stamens, and D. Gynoecium.
Mazus pumilus (Burm. f.) Van Steenis
Rare, found in cool and damp situations.

Athar 162, Near Jalalpur.

11. Mazus Lour.


Lobelia pumila Burm. f. Fl. Ind. 186, t. 60, f. 3, 1768.


Flowering & Fruiting: November-April.

Abundant in shady and damp localities.

Athar 65, Bijnor Inter College, Bijnor.

12. Striga Lour.


A scabrid, simple or branched, erect annual, turns blue when dry. Stem ribbed. Leaves linear, narrowly oblong, acute, hispid; hair tubercle based. Corolla white, nearly glabrous.

Flowering & fruiting: October-January.

Common in agricultural fields and grass-lands.

Athar 380, Teenaapur.
Orobanche Linn.


Flowering & Fruiting: February-May.

This plant parasitizes on Brassica campestris, Solanum melongena and Alyssum maritimum.

Ather 54, Bukhara.
Utricularia Linn.


Utricularia flexuosa Vahl, Enum. pl. 1:198, 1804; FLJ. 4:329, 1884;

A submerged, stoloniferous hydrophyte. Bladders subglobose, obliquely
mouthed, darken in colour with the age. Leaves pinnately dissected in
dichotomous filiform segments. Flowers in 3-8 flowered erect racemes,
yellow with red spots in the throat, bracteate. Corolla spurred,
hairy outside, bilabiate. Fruit subglobose capsule, fruiting pedicel
deflexed. Seeds lenticular.

Flowering & Fruitin: Rainy season.

Plants associated: Coratophyllum comersun, Hydrilla verticillata,
Typha angustata, Vallisneria spiralis.

Commonly found in ponds and temporary road side ditches in rainy
season.

Aher 687, Near Umrajpur.
Key to genera:

Trees or shrubs.

Leaves 2-pinnately compound;
flower blue; fruit orbicular ............. 1. Jacaranda

Leaves 1-pinnately compound.
Fruits cylindrical.
Flowers deep violet; fruits
soured like on long stalks ........... 2. Erythrina

Flowers yellowish-purple;
fruits curled near apex ............. 3. Haplophragma

Fruits compressed.
Flowers orange-red; a tree ......... 4. Spathodea

Flowers yellow; a shrub ........... 5. Ieceas

Climbers.

Tendril climbers; tendrils hooked.
Leaflets 2-3; flowers tubular,
orange ................................. 6. Pyrostegia

Leaflets 2; flowers with a
bread limb, yellow ............ 7. Bignonia

Root climbers with bell shaped,
orange flowers .......................... 8. Campsis


Jacaranda mimosaefolia D. Don in Bot. Mag. t. 631, 1822 & Edinb. N. Phil. Journ. 9,266, 1823; Sandwich in Kew Bull 456, 1953; Blatt &

Jacaranda acutifolia suct. (non. Humb. & Bonpl.).

A small to medium sized tree. Leaves compound, leaflets numerous, elliptic or sub-obliquely oblong. Flowers in axillary or terminal panicle, purple-blue, with yellowish-white throat. Stamens 4, didynamous; upper portion of the staminode thickened and densely villous. Fruit a sub-erubicular, loculicidal capsule.

Flowering & Fruiting: March-September.

Ather 709, Jain Farm.

2. Kigelia SC.


A medium sized, dark green tree. Leaves imparipinnate; leaflets 7-9, oblong-ovate, coriaceous; margins slightly undulate. Flowers in large pendulous, terminal racemes, deep violet, with pale-yellow streaks. Fruit indesicent berry, pendulous, long stalked, resembles a large gourd.

Flowering & Fruiting: April-September.

Ather 710, District Judge's Court.
3. Haplophragma P. Dop


Bignonia adensophylla Wall. ex G. Don Gen. Syst. 4: 22, 1837.

Bignonia adensophylla Wall. Cat. 6502, 1832.


Flowering & fruiting: September-March.

Ather 573, Jain Barr.


Spathodea campanulata Beauv. Fl. Gnar. 1: 47, tt. 27-29, 1805;
Matt & Mill. Beaut. Ind. ix. 97, t. 27, 1937.

A medium sized tree, crown rounded. Leaves opposite, imparipinnate. Flowers in dense subcorymbose terminal raceme; orange-red, campanulate.

Flowering: February-March

Ather 567, Engineer's Hostel, Bijnor.

5. Icema Juss.

Pyrostegia venusta (Ker.-Gawl.) Miers

A shrub. Leaves opposite, compound, leaflets 7-11, oblong lanceolate, serrate, reddish when young. Flowers bright yellow; in panicle. Fruit an erect capsule.

Flowering & fruiting: Nearly round the year.

Common, often planted for hedging.

Ather 601, near Nehru Sports Stadium.

6. Pyrostegia Linn.


A large, much spreading climber. Leaves 2-3 foliate (mostly three and pinnate); tendrils 3-fid, minutely clawed. Flowers in pendulous panicked cymes; bright-orange, tubular.

Flowering: December-March.

A very favourite climber for pergolas, arches and covering the walls.

Ather 630, Police Club, Bijnor.

7. Bignonie Linn.


A slender shrub, climbing by its 3-fid, claw like tendrils. Leaflets paired, digitate, entire, acute to acuminate. Flowers in axillary
pairs, peduncles slender; yellow, with deeper yellow lines in the throat. **Calyx** 5-lobed, membranous, with conspicuous veins. **Corolla** with a short tube and broadly ventricose limb with spreading lobes.

Flowering: January-June.

Not common. I have seen this plant in some private gardens.

Athar 750, Charan Negri.

C. Convolvulaceae


An extensive, deciduous, root climber. Stem obtusely angled, smooth glabrous; bark thin, dark brown. Leaves odd pinnate; leaflets often unequal sided at the base, ovate, ovate-oblong or lanceolate, acuminate, coarsely dentate, glabrous. Flowers large, in terminal pendulous, racemose, panicles. **Calyx** campanulate, divided almost half-way. **Corolla** bell shaped, scarlet or orange; lobes rounded. Stamens included, fruit a capsule, seeds winged.

Flowering & fruiting: March-December.

A very common climber. It rarely bears fruits in this area.

Athar 733, Nai Basti.
Key to genera:

Flowers yellow; fruits with four spines ........ 1. Pedalium
Flowers pink; fruits smooth ....................... 2. Sesamum

1. **Pedalium** Linn.


A procumbent, footed smelling herb, surface mucilaginous. Leaves alternate, obliquely ovate, repand-dentate, crenate, glandular. Flowers yellow, solitary-axillary, with two glands at the base of pedicel. Sepals 5, connate half way, glandular. Petals 5, corolla tube spreading obliquely, glandular pubescent externally as well as in the throat. Stamens 4; staminode 1, orange coloured. Style 1, filiform; stigma 2-lobedate. Fruit a pyramido-conical, 4-spine capsule, crustaceous.

Flowering & Fruiting: August-December.

Often found on road sides, particularly in the tract near Ganga.

Ather 207, Near Indi.

2. **Sesamum** Linn.


Erect annual herb, foetid smelling, glandular pubescent. Leaves lower ones usually 3-partite or palmately 3-foliolate; upper ones simple, lanceolate, serrate. Flowers solitary, axillary, 2-yellow glands at the pedical base prominent. Sepals 5, basally connate. Petals 5, corolla bilabiata, rosy-pink, spotted with yellow. Stamens 4; anthers gland tipped; staminode absent or minute. Capsule oblong, obtusely 4-angled and with 4-longitudinal grooves, beaked. Seeds numerous, compressed.

Flowering & Fruiting: August-November.

Cultivated as oil crop, the seeds yield an oil locally called "Til-Ke-Tol", found as an escape also.

Athar 130, Najibabad Road.
Martynia Linn.


Flowering & fruits: August-December.

Common in road side ditches.

Ather 493, Near Officers' Club.
LXXIX. ACANTHACEAE

Key to genera:

Flowers in definite, elongated, slender or stout spikes.

Plants erect.

Corolla white, variously blotched.

Stamens 4.

Bracts spino tipped; anthers bearded and on unequal heights, seeds 2, hairy 1. Lepidagathis

Stamens 2.

Leaves and bracts, broad; dark green stem without purple tinge; spikes continuous; wild 2. Adhatoda

Leaves and bracts narrow; stem with purple tinge; spikes interrupted; anthers spurred at the base; cultivated 3. Gendarussa

Corolla yellow or blue; stamens 4, 2 fertile and two staminodes; yellow flowered plant armed and blue flowered unarmed 4. Barleria

Plants prostrate, ascending or procumbent.

Capsule 4-seeded.
Spike secund; bracts broad with hyaline margins; flowers blue .... 5. Rungia
Spike radially symmetrical; bracts narrow or none; flowers pink with darker spots ............ 6. Restellularia
Seeds 15-16; corolla white; spike slender; sometimes whole plant reddish .................. 7. Hyrophila
Flowers in short heads, axillary clusters, panicles or solitary.
  Corolla pink, purple or pale purple.
    A pubescent (at least younger parts)
    trailing herb; flowers in compact short head (sometimes elongated);
    bracts orals represented by two opposite tufts of hairs .............. 8. Holcsonia
    flowers in open panicles,
    flowers arranged in curved secund racemes, which together form a large panicle; calyx gland pubescent; seeds 6-12; branches 4-angled .................. 9. Andrographia
    flowers in trichotomous cymes forming large panicles; calyx not gland pubescent; seeds 4;
    branches 6-angled ................ 10. Peristrophe
Flowers in axillary clusters;
bracts herbaceous ..................... 11. *Diplaptera*

Corolla blue or pale-blue; ovary with
more than two ovules in each cell.

Marshy herbs with yellow axillary
spines; flowers in axillary
clusters ............................. 7. *Hygrophila*

Plants without spines.

Prostrate herbs.

Stigma bifid.

Capsule seed bearing
from the base; internodes short; seeds with
out a ring of hygroscopic hair; capsule
glabrous ......................... 12. *Hemigraphis*

Capsule with a solid
base; internodes long;
seeds with a ring of
hygroscopic hair; capsule
pubescent ......................... 13. *Dipteracanthus*

Stigma with one lobe oblong
the other lobe redivided;
capsule seed bearing through-
out; seeds glandular or
nearly smooth .................... 14. *Staurogyne*
Erect herbs, viscid pubescent; longer filaments always woolly above; seeds 6, hairy ............ 12. Hemigraphis

1. Lepidagathis Willd.


Erect, suffruticose under shrub. Leaves in unequal pairs, ovate-obovate to spatulate, mucronate, smaller on branchlets. Flowers in spikes, white. Calyx glandular hairy; outer broader segments spine tipped. Corolla predominantly white, streaked with purple. Capsule 4-seeded. Seeds shortly hairy, especially on margins.

Flowering & Fruiting: February-May.

Rare. Found, occasionally, among the stones at the bank of the Ganges.

Athin 203, Raoli Ghat, Madhya Ganga Barrage.

2. Adhatoda Willd.

Adhatoda vasica (Linn.) Nees in Wall. Pl. As. Rar. 3:103, 1832; IND. 376, 1977.


A branched dark green, glabrous shrub. Leaves oblong-lanceolate; long petioled, acute; shining above, gland dotted (more evidently on dorsal surface). Flowers in short, dense, axillary spikes, arranged
towards the end of branches; peduncles dorsiventrally grooved. Bracts sessile, puberulous on both the surfaces, elliptic, sub-acute, 6-7 nerved, gland dotted dorsally; bracteoles 2, more densely puberulous than the bracts, ovate, acute. Calyx 5-partite; segments equal, lanceolate, acute, entire, single nerved. Petals 5, bilipped, upper lip hairy outside, notched; lower middle lobe with light purple veins. Stamens 2, filaments compressed.

Flowering & Fruiting: November-May.

Abundant on waste land, road sides and in uncared orchards.

I have seen this plant growing as epiphyte on the tree of *Ficus religiosa*.

Ather 199, Naseran Shah Ziyarat.

3. *Gendarussa* Nees


*Justicia gendarussa* Burm. f. Fl. Ind. 10, 1768; Felli. 4:932, 1885.

A common profusely branching hedge plant. Stem tinged with purple. Leaves oblong lanceolate, cuneate, acuminate, entire. Flowers in interrupted axillary and terminal spikes. Corolla white with purple blotch.

Commonly cultivated for hedging purpose.

Flowering & Fruiting: January-May.

Ather 314, Vardhman P.G. College, Bijnor.
4. *Barleria* Linn.

Key to species:

Plants spiny; flowers yellow .................. 1. *B. prietitis*

Plants not spiny; flowers blue .............. 2. *B. cristata*


A branched, spiny under-shrub. Spines 3-4 in the leaf axila, straight, white. Leaves ovate, petiolar, spine tipped. Spikes spinescent due to spine tipped calyx lobes. Corolla orange-yellow; 2-lipped, lobes spreading. Capsule, generally 2-seeded.

Flowering & Fruiting: October-May.

Occasionally found on dry soil.

Ather 304, Soeren Shah Ziyarat.


This taxon can be distinguished from the preceding one by its darker green colour, absence of spines and blue flowers.

Flowering & Fruiting: September-May.

Occasionally found among thick vegetation, near villages.

Ather 291, Bashta.

5. *Hunisia* Nees

Justicia pectinata Linn. Amoen. Acad. 4:299, 1759.

Rungia parviflora (Retz.) Nees var. pectinata Cl. in FBl. 4:550, 1885; FlGp. 2180, Repr. ed. 1960.

A profusely branched, prostrate herb. Stem older parts terete, younger 4-angled, shortly hairy; nodes swollen. Leaves small, elliptic-oblanceolate, acute; main lateral nerves 4-5 pairs. Flowering spikes axillary (paired or single) or terminal; second. Bracts dimorphic; sterile narrower and fertile broader, apex usually notched. Bracteoles always with a notched apex. Corolla bluish-white. Lower anther lobe with a white appendage. Gamy on a cupular disc.

Flowering & Fruiting: Rainy season and winter.

Abundant, found on a variety of soils, but usually in moist and shady places.

Athar 41, Bijnor.

6. Rostellaria Reichb.

Key to species:

Calyx segments edilate, obtuse; plant

Glabrous ........................................ 1. R. quinqueangularis

Calyx segments edilate, acute; plant

Hairy at least in upper part ............... 2. R. mollissima


Hostellaris peplioides (Nees) Nees in DC. Prodr. 11:375, 1847.

A prostrate ascending herb. Leaves shortly stalked, linear-lanceolate, glabrous. Spikes terminal; margins of the bracts scarious; bracteoles narrower than the bracts. Calyx 4-partite. Corolla rose coloured.


Flowering & Fruiting: August-November.

Common, found in marshy situations.

Athar 169, Hemrajpur.

2. Hostellaris mollissima (Nees) Nees in DC. Prodr. 11:373, 1847.


Differs from preceding species in densely villous spikes; calyx segments ciliate, narrower; upper part of the capsule hairy.

Flowering & Fruiting: Rainy and winter season.

Abundant. Found in grass lands, shady localities and cultivated fields.

Athar 120, Hemrajpur.

7. Hygrophila R.Br., annend. Heine

Key to species:

Flowers in axillary clusters; plant with

axillary spines ........................................ 1. H. surculata
Flowers in slender spikes; plant without spines ........................................ 2. H. polysperma


Flowering & Fruiting: September-November.
Corm in roadside ditches.
Atha 60, Near Daruki.


Hemialdelphus polyspermus (Hochb.) Nees in Wall. Fl. As. Har. 3:80, 1832 (August).

Hemialdelphus polyspermus var. joshianus Rao & Biswas, Ind. For. 94: 637, 1968, Syn. nov.

Flowering & Fruiting: October-March.

Common, prefers marshy places.

Athar 434, Jalalpur.


*Nelsonia canescens* (Lank.) Sprang. Syot. Veg. 1:42, 1825; Brenek.


A trailing or ascending, white pubescent herb, turns blackish on drying. Leaves entire, ovate, elliptic-oblong; lower larger and petiolate, upper smaller and subsessile to sessile; unequally paired, glandular hairy. Flowering spikes terminal (in my specimen), ovate, compact, hairy; bracts broad ciliate, calyx segments unequal, gland ciliate. Corolla purplish. Capsule 8-12 seeded, glabrous.

Flowering & Fruiting: December-May.

Rare. Found in moist shady places.

Athar 294, Gajrsula village.
9. Andrographis Wall.

Andrographis paniculata (Burm. f.) Wall. ex Nees in Wall. Pl. As. 
Rar. 3:116, 1832; Royle Ill. 298; FlD. 4:501, 1884; FUCP. 2:66,

Justicia paniculata Burm. f. Fl. Ind. 9, 1768.

A tall annual herb, branches four winged. Leaves lanceolate, acute,
tapering to the base; paler beneath, the leaves turn red in winter;
main lateral nerves 4-6 pairs. Flowers small, solitary, arranged in
spreading second, axillary and terminal racemes, the whole forming a
large panicle. Pedicel distinct, gland pubescent. Bracts lanceolate;
bracteoles small or none. Calyx segments equal, linear lanceolate,
somewhat incurved, gland pubescent. Corolla light pink, glandular
hairy on side, with purple spots inside. Filaments longitudinally
grooved, hairy. Anthers purple, bearded. Ovary placed on a cup shaped
disc. Capsule glandular hairy.

Flowering & Fruiting: September-January.

Common. Prefers sandy soil, grows among the hedges.

Ather 193, Seva Ashram, Vidurkuti.

10. Peristrophe Nees

Peristrophe bicalyculata (Hetz.) Nees in Wall Pl. As. Rar. 3:113,

Dianthera bicalyculata Hetz. Sv. Vetensk. Handl. 36:297, t. 9, 1775;
Observ. Bot. 1:10, 1779.
A large herb, sometimes attaining the dimensions of an under shrub. Branches thinly hairy and 6–angled, the angles more or less scabrid. Leaves ovate acuminate, strongly lineolate; sparsely hairy above and densely so abaxially on the nerves; main lateral nerves 6–7 pairs; petiole slightly winged, hairy. Flowers pink; in 3–chotomous cymes, forming long lax divaricate hairy panicles. Dactylo 2, unequal. Calyx sepals 5–6, greenish, crenate–dentate; margins ciliate. Corolla pink, hairy outside; upper lip entire, obtuse; lower longer and with 3 acute lobes. Filaments hairy. Ovary placed on a obliquely mouthed cup shaped disk. Seeds 4, papillose.

Flowering & fruiting: rainy and winter season.

Common. Found on wasteland, road side and in orchards.

Ather 36, Djnør.


Key to species:

Leaves glabrous, ovate acuminate .................... 1. D. verticillata

Leaves densely pubescent, nearly orbicular, rounded apex ......................... 2. D. riparia


Dianthera verticillata fors. Pl. Aeg.–Arab. 9, 1775.

A prostrate or decumbent dark green herb; branches angular. Leaves ovate, acuminate, cuneate at the base, entire. Flowers in axillary clusters, each cluster with a single perfect flower; bracts densely white ciliolate. Corolla 2-lipped, pink. Capsule ovate. Seeds echinulate.

Flowering & Fruiting: Late rainy season to whole winter.

Common. Found mostly near some water course and in graveyards etc.

Athar 439, Bijnor.


An erect herb, stem bluntly four angled, pubescent, nodes swollen. Leaves extipulate, petiolate, opposite, decussate, suborbicular, rounded at the apex; densely hairy, more so on nerves, hair multicellular; the lamina runs down the petiole, making it slightly winged. Flowers in axillary clusters, sessile, bracteate and bracteolate. Bracts pubescent, obtuse, prominently keeled in the lower half. Sepals 5, divided half-way down; segments acute, single nerved, pubescent with multicellular as well as glandular hair. Corolla two lipped, upper lip notched and lower 3-partite, gland pubescent; externally pink. Sigmoid didynamous, included, anterior pair longer than the posterior; the filaments of both the stamens on each side fused, filaments glabrous; anther cells distinct, placed on slightly unequal heights, shortly appendaged and apiculate. Gynoecium placed on a disc. Style long; stigma simple. The placenta remains attached to

*New record for present Indian territory.*
the valves of capsule at the time of dehiscence. Seeds 10-15, compressed.

Flowering & Fruiting: Winter season.

Rare. Found only once growing near a drainage on Bengali Colony road.

Ather 198, Meera Shah Mohammed.

Hooker had his own reservations regarding the species rank of this plant (FBA, 4:553). Although he included it as a full fledged species but considered it as a form of *P. roxburghiana* Nees. He wrote, "Perhaps only a form of *P. roxburghiana* Nees, differing in the softly pubescent flower clusters, and the very obtuse often exarinate bracts. The numerous examples are exactly alike, but come from one neighbourhood". Interestingly, the specimen, collected from Bijnor, a quite distant place from Pegu and Tanssorin, exactly matches with the specimens deposited at CAL. So, I have no doubt in my mind that it is quite distinct species from *P. roxburghiana* Nees, not a form of it.

12. *Hemigraphis* Nees, emend. T. Anders

Key to species:

Leaves shortly petiolate, ovate, obtuse ........ 1. *H. hirta*

Leaves distinctly petiolate, ovate,

acuminate ........................................ 2. *H. rupestris*


Ruellia hirta Vahl, Roxb. Fl. Ind. 3:46.

A softly and densely white pubescent herb. Stem long, creeping, 4-sided. Leaves ovate or oblong, crenate, the base as well as apex obtuse; lateral
nerves obscure on upper surface; hairy on both surfaces; petiole short. ** Heads 2–6 flowered; bracts elliptic, pubescent, margins slightly dentate; bracteoles none. Calyx green, segments five, unequal, united nearly to the middle from the base, hairy. Corolla pale-blue, soon fading to brown, shortly hairy outside. The lower lip has a dense transverse pubescence at the junction of limb and the tube. Stamens 4, didynamous; the longer filaments hairy on inner side lengthwise. Ovary pubescent at the apex; style hairy, stigmas subequal, one branch well developed the other just a protuberance. **

** Seeds 6–7.**

** Flowering & Fruiting: Late winter.**

** Common in agricultural fields.**

Ather 90, Barrage road.


**Hemigraphis lutescens** (Hayne ex Roth ) Nees var. ** rupestris** (Hayne ex T. Anders) Clarke, Fl. Ind. 4:424, 1884.

** Can be distinguished from above species by erect habit; larger, petiolate, and secundate leaves; corolla tube blue, suffused with yellow.**

** Flowering & Fruiting: October-May.**

** Rare. Found on stony river and canal banks.**

Ather 449, Mandawar.


_Dipteracanthus dejectus_ Nees. in Wall. Pl. As. Bot. 3:92, 1832.

Prostrate, branched herb, with a woody base; nodes swollen; younger parts distinctly hairy. Leaves ovate-lanceolate, rounded or subcordate at the base obtuse or acute at the apex; petiolate. Flowers solitary. Bracteoles spatulate, subacute; longer than the calyx. Corolla pale-purple; hairy outside. Vary densely hairy near the top. Capsule densely pubescent.

Flowering & Fruiting: February-May.

Rare. Among the hedges on dry and sandy soil.

Athal 233, Vidukutti Road.

14. _Staurogyne_ Wall.


_Ebermaiera glutinosa_ Wall.; Flügel. 4:396; Prain Beng. Pl. 798.

_Ebermaiera glauca_ T. Anders in Journ. Linn. Soc. 9:450 (not of Nees).

Stems many prostrate, rooting at the nodes. Leaves all opposite; shortly stalked, petiolate slightly pubescent; elliptic, subobtuse,
entire, tapering to the base; minutely pubescent or glabrous. Heads pseudo axillary on short branches, 2-6 fid. Bracts narrowly oblong; hair of two types longer simple and smaller glandular. Calyx glandular; two calyx segments are much narrower and two are broad. Filaments hairy with purple hair. Stigma two lobed, one lobe oblong the other bifid.

Flowering & Fruiting: Late rainy and winter season.

Common, often found in agricultural fields.

Ather 220, Bijnor.
Key to genera:

Large trees.
Leaves quite rough adaxially and pubescent abaxially; calyx accrescent in fruit ......................... 1. *Tectona*
Leaves not rough; calyx not accrescent in fruit ......................... 2. *Dreana*

Shrubs or herbs.
Flowers in head compact, oval, head like spike; pink or white; a prostrate herb .......................... 3. *Phyla*
Flowers in elongated spikes, dichasia cymes etc.

Stamens exerted along with at least some part of filament.
Leaves simple; flowers pink, red or white .................. 4. *Clerodendrum*
Leaves 3-foliolate; flowers blue ................................. 5. *Vitex*

Stamens included (sometimes anthers exerted in *Callicarpa*).

Fruit fleshy.
A spinosecent, strongly aromatic herb; flowers in umbellate, axillary corymb; drupe violet when ripe .......... 6. *Lantana*
A softly pubescent shrub;
leaves white tomentose
beneath; drupe white,
pink ...................... 7. **Callicarpa**

Fruit dry; flowers in long
spikes or corymbs; herbs .......... 8. **Verbena**

1. **Tectona** Linn. f., nom. cons.


A large deciduous tree with a dome shaped or broadly conical crown.

Bark dark-grey, young branches four angled and grey pubescent.

Leaves broadly elliptic or obovate or sometimes nearly orbicular,
quite scabrid adaxially and stellate tomentose abaxially. Flowers
in large, terminal, pyramidal panicles. Fruit enclosed in persis-
tent, accrescent and inflated calyx.

Flowering & Fruiting: July–November.

Not uncommon. In this area it is grown as a timber tree.

Athan 591, Officer's colony.

2. **Prensa** Linn.


**Prensa latifolia** Roxb. var. **mucronata** (Roxb.) Cl. in FBl. 4:570, 1885.
A medium sized tree, young branches often pubescent. Leaves broadly ovate, acuminate, membranous, entire; main lateral nerves 5-7 pairs. Flowers in terminal corymbs, rusty pubescent. Corolla 2-lipped with hairy throat, upper lip reflexed backwardly. Fruit globose, dark purple, verrucose; supported by enlarged calyx.

Flowering & Fruiting: April-July.

Not uncommon, often found near villages.

Athar 318, Fazalpur.

3. Phyla Lour.


Verbena nodiflora Linn. Sp. Pl. 20, 1753.


An extensively branched, prostrate, herb, rooting at the nodes. Leaves obovate, cuneate, coarsely toothed in the upper part. Flowers in axillary, compact, hard globose-oblong heads; elongating with the anthesis. Sepals 2-lobed. Corolla 2-lipped, white turning to rose purple. Fruit separating into two pyrenes.

Flowering & Fruiting: Major part of the year.

Common, on road sides, grass-lands and dry river beds.

Athar 257, Rawdi Chat.
4. Clerodendrum Linn.

Key to species:
Climbers; leaves punctate near the base;
flowers brick-red in large corymbs .......... 1. C. splendens
Erect shrubs.

Leaves opposite,

Hairy herbs; calyx enlarged,
pink in fruit ......................... 2. C. viscosum
Glabrous shrubs; calyx not enlarged
in fruit; leaves extremely bitter;
usually grown for hedging .............. 3. C. inerme

Leaves ternate; entire; drupes bluish-
green; seated on enlarged red calyx ...... 4. C. indicum


A dwarf, much spreading climber. Leaves ovate-oval-oblong; base
sub-cordate-rounded; acuminate, margin entire, often undulate,
nerves prominent, shining dark green above, paler beneath; densely
gland dotted near the base. Flowers in large clusters of brick-red
flowers.

Flowering: Cold season, no fruit setting in the area.

Common, a very beautiful climber, much valued to plant near gates
and to cover the fence.

Athar 742, A.J. Inter College.
Clerodendrum viscosum Vent.


An erect, branched, hairy perennial herb; older parts glabrous or glabrescent, younger parts more hairy, stem obtusely four angled, often purple tinged. Leaves ovate with sub-cordate base, crenate dentate, often gland hairy. Flowers in cymes combined into terminal panicles, rusty pubescent. Calyx with rusty pubescence, more so near the base, hairy inside too, becomes bright red in fruit. Corolla white, near the base rusty hairy externally. Anthers red.

Flowering & Fruiting: March-July.

Abundant, commonly found along road sides, Railway tracks and in fallow land.

Athar 232, Vidur Kuti Road.


A straggling shrub. Leaves obovato to elliptic-oblong, glabrous, subfleshy. Flowers pure white with purple red filaments of stamens, in axillary 3 flowered cymes. Corolla tube long, slender.

Flowering & Fruiting: June-December.

Common, a favourite plant of gardeners for hedging as it is said to keep the snakes away.

Siphonanthus indicus Linn. Sp. Pl. 109, 1753.

Clerodendron siphonanthus H. Br. in A. Alt. Hort. Kew. ed. 2, 4:65,

This species can be readily distinguished from other species of
Clerodendrum by erect, tall habit; sulcate stem; tomentose, linear
lanceolate, acute, entire leaves and the calyx which turns bright
red in fruit.

Flowering & Fruiting: Summer and rainy season.

Common, found in deep places.

Ather 767, Himatnagar.

Clerodendrum philippinum Schauer, is often planted as ornamental.

It can be readily distinguished from other species of the genus
by the flowers which are in compact terminal corymbose inflorescence
and have double corolla.

5. Vitex Linn.

Vitex negundo Linn. Sp. Pl. 638, 1753; FBI. 4:583, 1883; FAL. 2:

A large spreading shrub, bark dark grey; young branches four angled,
grey tomentose. Leaves digitately three foliaceae, white tomentose
beneath, crenate-serrate. Flowers light-blue; in terminal panicles.

Fruit a globose drupe, black on ripening.

Flowering & Fruiting: Major part of the year.
Common near orchards, on borders of the fields and waste lands.

Athar 139, Vidur Kuti Road.

6. Lantana Linn.


Lantana aculeata Linn. Sp. Pl. 627, 1753.

Lantana camara Linn. var. aculeata (Linn.) Moldenke, Torreys 34:9, 1934.

An erect or straggling spiny shrub, with an unpleasant odour.

Stem 4-angled, with recurved spines. Leaves ovate, crenate, petiolate, hispid above. Flowers in pedunculate corymbs; elongating with the anthesis. Corolla tube 4-lobed, lobes unequal; pink or yellow. Fruit a drupe, deep purple.

Flowering & Fruiting: Nearly round the year.

Abundant, can be located in almost any type of mesophytic or xerophytic locality.

Athar 87, Mandawar.

7. Callicarpa Linn.


A shrub with drooping branches; nearly whole plant except upper leaf surface, densely stellate tomentose. Leaves elliptic, oblong
to lanceolate, crenate, serrate. Flowers rose-pink in dense axillary
dichotomous cymes. Drupe white.

Flowering & Fruiting: July-December.

Cultivated. Planted in gardens.

Athar 443, Sanjay Farm.

8. Verbena Linn.

Flowers small, lilac; in long; recurved
spikes; wild herbs......................................... 1. V. officinalis
Flowers larger, variously coloured; in
flat topped corymbs; cultivated herbs ....... 2. V. hybridia

1. Verbena officinalis Linn. Sp. Pl. 20, 1753; FDI. 4:565, 1885;

An erect herb, more or less gland pubescent. Branches 4-angled;
puberulous. Leaves variously lobed, narrowed to the base, 3-lobed.
Flowers in terminal spikes, elongating with the anthesis, bracteate;
bracts ovate, acute, hairy. Calyx twice as long as the corolla,
minutely toothed and glandular hairy. Corolla imbricate, posterior
petal outermost in the bud; hairy, bluish-pink or blue; limb
spreading, throat hairy. Stamens 4, filaments short. Stigma oblique,
obscurely 2-lobed.

Flowering & Fruiting: Rainy and winter season.

Common on road sides and waste lands.

Athar 382, Hemrajpur.
2. *Verbena hybrid a* Grönl. & Rpl. HE'DU. 401, 1977 (in obs.).

This is a cultivated species and can be easily distinguished because of being more or less hispid; leaves coarsely crenate; flowers in flat topped corymbs, larger and variously coloured.

Flowering & Fruiting: Winter season.

Common. A very common winter annual.
LAMIACEAE (LABIATAE nom. alt.)

Key to genera:

Flowers predominantly white.

Fruiting spikes woolly

Fruiting spikes not woolly.

Calyx 2-lipped.

Stamens 4, declinate; 2-upper
filaments toothed at the base .... 2. Ocimum
Stamens 2 (there may be 2-
staminodes) connective
articulated with the fila-
ments .......................... 3. Salvia

Calyx not 2-lipped.

Upper lip of corolla 3-lobed,
not woolly; flowers in axillary
and terminal, compact, elongated,
interrupted, spikes; a large
herb ................................. 4. Pogostemon
Lower lip of corolla 3-lobed;
upper lip densely woolly;
flowers in axillary, distant,
glomerate whorls; a dwarf
herb ................................. 5. Leucce

Flowers otherwise.

Flowers blue, violet.

Erect, tall herb, calyx 10 nerved .... 6. Hyptic
Ascending or decumbent herb;
calyx 15-nerved ........................ 7. Nepeta

Flowers pink, pinkish or orange.
Pink or pink-red, upper lip not woolly.

Lower pair of the stamens longer; anthers of upper pair 2-celled, of lower pair 1-celled, cells transverse, parallel; stout herbs ............. 8. Anisomeles

Upper pair of stamens longer;
all anthers 2-celled; slender herbs ................................. 7. Nepeta

Flowers deep orange, in axillary glomerate whorls; calyx teeth spine tipped; upper corolla lip longer, densely woolly .......................... 9. Leonotis

1. Colebrookea J.E. Smith


Colebrookea terminalis Roxb., Fl. Ind. 3:25, 1832.

An erect, branched, tomentose, shrubby herb. Stem angled, grooved, branches usually tomentose. Leaves petioled, pubescent above, tomentose and gland dotted beneath; base acute; margin crenate-serrate;
Oeimun canum Sims

Flowering & Fruiting: December-April.

Rare. Collected only once from dense vegetation along Ganga bank. It is a plant of scrub forest, quite common in forest tracts of this district.

Ather 315, Vidur Kuti.

2. Ocimum Linn.


Ocimum americanum auct. non Linn.

An erect branched herb. Leaves ovate, elliptic-oblanceolate, punctate, entire to shallowly toothed, cuneate. Flowers white (sometimes tinged with purple); inflorescence lax. Calyx 5-lobed; upper lobe the largest and thicker, nearly rounded. Corolla bilabiata. Stamens 4, declinate, exerted. Nutlets ellipsoid, black.

Flowering & Fruiting: August-April.

Abundant in cultivated land, also on road sides and waste places.

Ather 344, Teemarpur.
3. *Salvia Linn.*


An erect roughly pubescent herb. Stem stout, fastigiatley branched, obtusely 4-angled; lower nodes tinged with purple, hoary pubescent. Leaves before flowering there are only radical leaves, forming a rosette; oblong, lanceolate, obtuse or subacute, crenate, petiolate; petiole base dilated; base usually acute and often decurrent, both the surfaces with small hairs. Floral leaves stalked, ovate, subacute, more hairy than the lower leaves and with few glandular hairs near the base. Flowers in panicled, glandular pubescent spicate racemes. Calyx pedicelled, pubescent with calleters as well as simple hairs, 2-lipped; upper lip entire, shorter than the lower, reflexed. Corolla white or lilac, hairy out-side; tube with a ring of hairs inside. Stamens 2, connective elongated and articulated with the short filament; anther cells separate, upper fertile, lower empty, staminodes 2. Nutlets minute, brown.

Flowering & Fruiting: January-May.

Abundant. On waste-lands and old building walls.

Ather 80, Qazi Wala.

4. *Pogostemon Deaf.*


*Origanum benghalense* Burn. f., Fl. Ind. 126, t. 39, f. 3, 1768.

An under shrub, more than 1 meter high, aromatic, young parts grey tomentose; branches terete or subquadrangular; older parts often purple tinged. Leaves ovate, acute, doubly serrate, base rounded, cuneate or very much unequal. Flowers in dense, villous, bracteate whorls, crowded in numerous, cylindric spikes, the whole forming an erect terminal panicle. Bracts foliaceous, sessile, ovate, acute, softly hairy outside. No gland could be detected; bracteoles mostly oblique, acute, villous outside. Calyx not glandular pubescent, teeth triangular, lanceolate, ciliate, 5-nerved. Corolla white, tube slender, curved, 4-lobed; upper lip consisting of 3-lobes; middle one narrow and longer, upper lip gland pubescent out-side; lower lip with few hairs. Filaments bearded near the upper part with pink or dark pink moniliform hairs, the base being pubescent with white hairs, middle region glabrous.

Flowering & Fruiting: Late rainy to winter season.

Common, in road side ditches.

Athar 63, Eid Gah.

5. Leucas R.Br.


An erect hairy much branched herb; hair usually spreading. Leaves subsessile or shortly petiolod, linear-lanceolate, obtuse, entire, hairy, more so abaxially. Flowers in axillary and terminal glomerate whorls. Calyx tube obovate, glabrous in lower half and hairy in upper half; mouth oblique, wide, toothed, teeth subulate. Corolla 2-lipped; upper lip much smaller white woolly; lower lip spreading; middle lobe glabrous and large; lateral lobes acute and smaller. Stamens 4, didynamous; filaments dilated; anthers red. Nutlets brown, with subtruncate apex, smooth.

The arrangement of hair on the upper lip is quite beautiful, whole top of upper lip is covered with fine, cottony, irregularly arranged hairs, but on the margins there are comparatively thicker, silvery, downwardly directed and well trimmed hairs.

Flowering & Fruiting: Rainy and winter season.

Abundant in cultivated fields, on road sides and waste-lands.

Ather 6, Kherki Village.


*Ballota suaveolens* Linn. Syst. (ed. 10). 1100, 1759.

A tall aromatic herb; stem quadrangular, rigid, hispid. Leaves petiolod, ovate, cordate, dentate, pubescent, villous adaxially
as well as abaxially. Flowers in axillary and terminal panicles, blue in colour. Calyx strongly 10-nerved, enlarging in fruit. Stamens 4, didynamous; filaments densely villous. Nutlets oval, obovate, 3-4 mm long, slightly compressed, rugose.

Flowering & Fruiting: September-February.

Commonly found on road sides.

Athar 175, Ranger's Office.

7. Nepeta Linn.


Glechoma hindostana Roth, Nov. Fl. Sp. 259, 1821.


An annual pubescent erect herb with erect or ascending branches; stems many, quadrangular. Leaves long petioled, hairy, ovate or ovate-cordate, acute, coarsely crenate, base sometimes unequal; whorls few flowered; bracts setaceous, hairy, acute, single nerved. Calyx 5-toothed, tubular, tips pink, Corolla 2-lipped, rose or bluish with dark pink spots in throat, hairy outside, except lower part of the tube; upper lip shorter and notched; lower lip larger, hairy inside; middle lobe largest and retuse. Stamens 4, posterior pair longer. Nutlets minute, oblong ellipsoid, white spotted.

Flowering & Fruiting: Cold season.
Anisomeles indica (Linn.) O. Kuntze

A. Flowering twig, B. Flower, C. Stamens, D. Flower part (enlarged) and E. Pistil showing gynobasic style.
Anisomeles indica (Linn.) O. Kuntze
Not uncommon, found along water courses and other moist and shady places.

Ather 52, 184, Haldaur.

9. **Anisomeles** R.Br.

**Anisomeles indica** (Linn.) O. Kuntze, Rev. Gen. Pl. 2:512, 1891;

**Nepeta indica** Linn. Sp. Pl. 571, 1753.


**Epineroidi indicus** (Linn.) Rothm. Fedde Repert. 53:12, 1944.

Erect aromatic, densely hairy, annual herb (sometimes perennial). Stem quadrangular, each face grooved. Leaves ovate-lanceolate, rather thick; base rounded to cuneate, crenate-serrate, apex acute. Verticillasters many flowered, combined to form a dense terminal panicle. Bracts linear, entire and single nerved. Calyx gland dotted; upper half hairy inside too; lower glabrous. Corolla tube hairy outside and lower lip with purple hairs inside, there is a ring of hairs at the base inside the tube, near the ovary. Nutlets ovoid, shining.

Flowering & Fruiting: Round the year.

Common, grows gregariously along the "Pogdandie" (earthen roads).

Ather 171, Near Teenmarpur.
Leonotis nepetaefolia (Linn.) W. Ait.
9. **Leonotis R.Br.**


**Phlomis nepetaciformis** Linn. Sp. Pl. 396, 1753.

A tall erect, hairy annual. **Stem** 4-angled, sulcate. **Leaves** petiolated, whitish hairy, ovate, crenate, acute, base cuneate. **Whorls** axillary, dense, globose. **Bracts** linear, deflexed, spine-tipped. **Corolla** deep orange, upper lip densely orange woolly and lower lip with 3-parallel rings of white hairs inside.

**Flowering & Fruiting:** September-February.

Not uncommon, found near the villages populated in the vicinity of Ganga.

Ather 368, Ganj.

This plant can be readily recognised in the field due to its deep orange flowers, coupled with spiny bracts and orange woolly upper lip. No other member of Lamiaceae exhibits these characters, in this area.
Leonotis nepetaefolia (Linn.) W. Ait.
A head in close up
Platago Linn.


A perennial glabrous herb. Leaves radical, broadly ovate or oblong-ovate, toothed or nearly entire; petiole long. Flowers on long peduncled spikes, cylindric, dense to lax or interrupted; bracts ovate-oblong, margins ecnsious. Sepali 4, connate, lobes oval-oblong. Petal 4, corolla tube long, lobes reflexed, and spreading at length. Stamens 4, inserted at the base or slightly higher in the corolla tube. Fruit a 2-celled, ovoid, oblong capsule, circumscissile in the lower half.

Flowering & Fruiting: January—May.

Occasionally found on the banks of the Ganges.

Athar 307, Mandawa.
LXXXIII - NYCTAGINACEAE

Key to genera:

Spiny, straggling shrubs with brightly
coloured, foliaceous bracts ................... 1. Bougainvillea

Unarmed small herbes.

Ribs of the fruit glandular; root
normal ........................................ 2. Boerhavia

Ribs of the fruit not glandular;
root tuberous ............................... 3. Mirabilis


Two common species, B. glabra Choisy and B. Spectabilis Mill., are
cultivated in this area. Out of those the former one (with glabrous
leaves and stem and puberulous porianth) is common place. There is
a magnificent array of varieties of this taxon. The varieties
differ in flowering time, leaf variegation and colour of the bracts.
Some most sought after varieties are, "Begum Sikandar", "Mahara",
"Thimma" and "Dr. Rao".

2. Boerhavia Linn.

Key to species:

Prostrate herbes; leaves in unequal
pairs; flowers subsessile ..................... 1. B. diffusa

Scandent herbes; leaves in equal
pairs; flowers long pedicelled .............. 2. B. chinensis


A prostrate to suberect herb. Stem slender, nodes swollen. Leaves opposite in unequal pairs, broadly ovate to orbicular; slightly fleshy, white beneath. Flowers in small umbels. Perianth constricted below the middle, rosy purple or bright pink, glandular hairy and greenish in lower half. Stamens 2. Style 1; stigma penicillate. Fruit clavate, 5-ribbed, glandular.

Flowering & Fruiting: Nearly round the year.

Abundant in waste places, sometimes on walls.

Ather 121, Nal Basti.


Valeriana chinensis Burm. f. Fl. Ind. 15. t. 6. f. 3, 1768.


Flowering & Fruiting: April-November.

Often found among the hedges.

Ather 26, Jain Farms.


Erect branched herb with a tuberous root. Stem red, swollen at the nodes. Leaves ovate-triangular, cuneate, cordate at base. Flowers in axillary leafy corymbs. Perianth 5-fid, variously coloured, red, pink, white or spotted. Stamens 5(-3), exserted. Fruits ellipsoid, ribbed or rugose, black to dark-brown.

Flowering & Fruiting: July-December.

Often cultivated in gardens and parks. Also found as an escape.

Athar 497, Bukhara Colony.
**Key to genera:**

**Amaranthaceae**

- **Flowering spikes green (not silvery or white).**
  - **Fruit spinescent; flowers 2-sexual; leaves opposite.**
    - **Fruit with stellately spreading, hooked awns**
      - 1. *Pupalia*
    - **Fruit with paired, straight spines**
      - 2. *Achyranthes*
  - **Fruit not spinescent; leaves alternate; flowers monoecious or polygamous**
    - 3. *Amaranthus*

**Flowering spikes, white silvery-white or red.**

- **Amaranth villosum.**
  - **Stamens free in upper part, slightly connate near base.**
    - Tall rambling herbs;
      - stamens five, with interposed staminodes
        - 4. *Aerva*
    - Small erect herbs; stamens 2,
      - staminodes none
        - 5. *Netheaserva*
  - **Stamens forming a tube**
    - 9. *Gamphrena*
Perianth glabrous.

Perianth pure pink; fruit
a crustaceous nut .................. 6. Digera

Perianth shining silver, with purple tinge; fruit
circumscisile ....................... 7. Celosia

Prostrate (sometimes ascending) herbs.

Spikes axillary; filaments free.

Leaves alternate; anthers 2-celled ... 3. Amaranthus

Leaves opposite; anthers 1-celled .... 8. Alternanthera

Spikes terminal; filaments connate to
form a tube .......................... 9. Comphrena

1. Pupalia Juss., non. cons.


An erect or rambling much branched shrub. Stem bluntly quadrangular; nodes swollen. Leaves opposite, ovate-oblong; base tapering or rounded, apex acute, entire, appressed hairy, petiolated. Flowers in terminal and axillary lax spikes; each cluster comprises 2-3 perfect flowers surrounded by some rudimentary ones; bracts and bracteoles pilose. Perianth tepals 5, ovate-oblong, sharply tipped. Stamens 5, filaments short connate at the base; anthers 2-celled. Stigma capitellate. Fruit a membranous utricle, abruptly narrowed to the apex. Seed compressed, black and shining.
Flowering & Fruiting: Rainy season.
Abundant, found among the hedges.

Ather 147, Meeren Shah.

2. Achyranthes Linn.


An erect simple or branched herb. Stem quadrangular, swollen at the nodes. Leaves elliptic-obovate, appressed hairy when young and sub-glabrous later. Flowers in terminal and axillary long spikes, greenish-white, deflexed; bracteate and bracteolate; bracteoles paired, spinescent, pink. Perianth segments 5, whitish green, scarious margined, acute, 3-nerved. Stamina 5, filaments connate at the base; pseudo staminodes with fringed scales. Fruit a thin walled utricle, enclosed in hardened perianth. Seed 1.

Flowering & Fruiting: Throughout the year except May and June.

Abundant. Found on road sides, waste places, fallow lands and old walls.

Ather 144, Husainpur.

3. Amaranthus Linn.

Key to species:
Erect or ascending herbs; leaves more than 1 cm long.

Leaf axils with long spines ............... 1. A. spinosus
Leaf axils without spines.

Perianth segments and stamens 5;
fruit circumsessile ........................ 2. A. cruentus
Perianth segments and stamens 3;
fruit usually indehiscent .............. 3. A. viridis

Prostrate herbs; leaves not more than 1 cm long; clusters all axillary ............ 4. A. roxburghianus


An erect, spinous herb. Stem terete, glabrous, often tinged with red; branches with one or two depressed lines running between the nodes. Spines borne in leaf axils (not 5 as mentioned by Guthrie but only 2-3) yellow when mature. Leaves ovate and lanceolate, apex notched, with a bristle, glabrous above, main lateral nerves 7-9 pairs, more prominent on abaxial surface, petioles shorter than the blade. Flowers numerous, sessile in axillary clusters and terminal, more or less interrupted, spikes. Bracts usually shorter than the tepals, linear and usually spine tipped. Male perianth ovate, acute, bristle tipped and segments boat shaped. Female perianth much smaller and with oblong-obtuse, apiculate segments. Stamens five; anthers yellow. Styles 2, spreading and hairy inside. Fruit ovoid, thickened above, membranous, rugose, circumsessile. Seeds black, shining.

Flowering & Fruiting: July-November.
Abundant, found in waste places, road sides and near brick kilns.
Athan 194, Bakhshi Mala.


*Amaranthus hybridus* Linn. *sub. sp. cruentus* (Linn.) Thell. *var. paniculatus* (Linn.) Thell. in *Asch. & Gray*, *syn. 5*(1):247, 1914.


*Flowering* & *Fruiting*: Rainy and winter season.

*Common.* Found in cultivated fields, along water courses.

Athan 768, Qazi Para.


An erect much branched annual herb, glabrous; branches sulcate, often, especially the older parts, tinged with purple. *Leaves* ovate
or deltoid; base unequal, apex notched, with a small bristle; main lateral nerves 6–8 pairs, petiolate. Flowers shortly stalked, arranged in few flowered axillary clusters and in slender axillary and terminal panicked spikes; bracts shorter than the perianth lobes, ovate-oblong, acute, membranous, with a single green nerve (keel). Tepals 3. Stamens 3, filaments hyaline, membranous; anthers yellow. Styles 2, hairy. Fruit indesiccant, compressed, suborbicular, acute, rugose. Seeds minute, lenticular, dark purple and polished.

Flowering & Fruiting: rainy and winter season.

Abundant, on road sides, gardens, grass lands and old walls.

Ather 520, Aryan Nagar.


This plant is quite easy to recognise in the field because of its prostrate habit, smaller leaves and flowers in axillary clusters.

Flowering & Fruiting: April–September.

Commonly found on road sides, as a weed in lawns and sometimes on walls.

Ather 196, Chahasheerin.


A scandent or climbing undershrub with long hoary tomentose, terete branches; older branches often red or purple tinged, swollen at the nodes. Leaves opposite below and alternate above, elliptic-lanceolate or ovate, obtuse or acute and mucronate, glabrous or softly hairy, normally densely pubescent on under surface; base tapering into a petiole. Flowers silvery-white, 2-sexual; arranged in ovoid or cylindric axillary and terminal subseccil; white woolly spikes; spikes often paired. Bracteoles shorter than the perianth, ovate, acuminate, hairy on the back, hyaline with a median green band. Stamen 4, with alternating staminodes, all connate basally to form a cup around the ovary. Seeds lenticular, black and shining.

Flowering & Fruiting: August–March.

Common, among the hedges and undergrowth in orchards.

Athr 191, Nangla Ialampur.

5. *Netthossera* Wright.

*Netthossera brachiata* (Linn.) Wright, Icon. 6:1, 1853; FMI. 4:726, 1887; FUGP. 2:139, Repr. ed. 1960; FBP. 225, 1878.

*Achyranthes brachiata* Linn. Mant. 1:50, 1767.

Flowering & Fruiting: August-January.

Note. Sometimes found among the undergrowth in mango orchards.

Ather 532, Gajraula village.


Achyr antheae alternifolia Linn. Hort. Pl. 30, 1767.


Annual, erect, glabrous, herb. Stem flexuous. Leaves ovate-oblong, entire, acute. Flowers sub-sessile in axillary, peduncled, spiciform racemes, ternate, 2 outer reduced to scales the middle one perfect. Perianth not scarious, segments 5, oblong, pink, persistent. Stamens 5, filaments filiform; anthers 2-celled. Fruit utricle, compressed, crustaceous. Seeds 1, minutely rugose.
Flowering & Fruiting: August-November.

Common in cultivated fields, very fondly eaten by the livestock.

Athar 699, Hemrajpur.

7. *Celosia* Linn.


Flowering & Fruiting: Late rainy season to winter.

Common in sugar-cane and *Cajanus* fields

Athar 167, Kotwali Road.


Key to species:

Spikes not spinescent; leaves narrow.

A glabrous herb; spikes purple tinged; staminodes entire or 2-3 toothed

1. *A. sessilis*
An appressed hairy herb; spikes white; staminodes toothed .................. 2. *A. polygonoides*

Spikes spinescent; leaves broad .................. 3. *A. pungens*


**Comphrena sessilis** Linn. Sp. Pl. 225, 1753.

A prostrate, extensively ramified, glabrescent herb, stem terete, with scattered curly hairs. Leaves show much variation, from oblong-obovate to lanceolate, narrow, entire. Flowers in axillary, purple tinged, subglobose, solitary spikes. Perianth lobes 5, white, scarious, narrowly ovate. Stigmas 3 (rarely 2); anthers 1-celled, fruit utricle, 1-seeded, broadly obcordate. Seeds reddish-brown, shining.

Flowering & Fruiting: August-January.

Abundant along the water courses and margins of ponds and ditches. Athar 343, Divan-e-ala.


**Comphrena polygonoides** Linn. Sp. Pl. 225, 1753.

**Alternanthera paronychoides** St.-hil. Voy. Sres. 2:43, 1833; Fr. 222, 1978.

A prostrate, much branched, herb; rooting at the nodes, appressed hairy. Herbarium specimens turn slightly blackish. Leaves opposite,
petiolate, spathulate-elliptic, acute or obtuse. Flowers in dense sessile, globose, axillary, white shining spikes; bracts and bracteoles small scarious, white. Perianth lobes 5, shining, white, lanceolate, acute, biserate or densely woolly below. Stamens 5, filaments slightly connate below; staminodes distinct, toothed at the apex. Anthers reniform, yellow. Fruit utricle, brown.

Flowering & Fruiting: Rainy and winter season.

Not uncommon, grows on the bottom of dried ditches.

Ather 136, Near Neeran Shah.


Alternanthera achyrantha R. Br. Prod. 417, 1810.

(non Alternanthera achyrantha Forsk. 1775).


This species can be readily distinguished by its broader oblong, orbicular leaves and spinescent spikes.

Flowering & Fruiting: April-October.

Rare. Occasionally occurs in sandy soil.

Ather 640, Near District Jail.


An erect or ascending herb. **Stem** white tomentose, somewhat swollen and tinged with red at the nodes. **Leaves** oblong, lanceolate, obtuse, finely appressed hairy beneath; nerves obscure adaxially. **Flowers** in subglobose, elongating heads, at maturity fruits fall away leaving the naked rachis; bracts and bracteoles navicular; bracteole with dorsal crest, **lerianth lobes** 5, narrowly, lanceolate, densely white, long woolly. **Stamens** 5, filaments connate to form: staminal tube, 5-10 toothed. **Fruit** compressed utricle. **Seed** light-brown.

**Flowering & Fruiting:** February–November.

**Abundant on road sides, waste-lands and grass-lands.**

Ather 107, Vardhman P.G. College, Bijnor.
LXXXV. Chenopodiaceae

Key to Genera:

Plants with dark red, napiform roots ........... 1. Beta
Plants without such roots,

Flowers unisexual; utricle enclosed
in spiny structure ......................... 2. Spinacia
Flowers bisexual; utricle not
enclosed in spiny structure.

Leaves linear, narrow, sessile ........... 3. Kochia
Leaves broad, petiolate .................... 4. Chenopodium

1. Beta Linn.


Flowering & Fruiting: April-June.

An important crop plant, grown for its roots, which are used as salad and vegetable.

2. Spinacia Linn.


An erect herb, stem with red streaks. Radical leaves ovate-oblong, long petiolate, somewhat fleshy; upper ones smaller, sessile. Male
flowers in spikes and female ones in lower axile. Fruits enclosed in spiny bracts.

Flowering & Fruiting: March-June.

Cultivated for the sake of leaves, used as vegetable.

Athar 300, Bijnor.


Chenopodium scoparia Linn. Sp. PI. 221, 1759.


Flowering & Fruiting: August-September.

Extensively cultivated as pot plant as well as in beds.

Athar 494, Exhibition Ground.

4. Chenopodium Linn.

Key to species:

An aromatic herb ........................................ 1. C. ambrosioides

Non aromatic herbs.

Seeds dull black ........................................ 2. C. murale

Seeds shining ............................................ 3. C. album


Flowering & Fruiting: March - October.

Common in waste places, especially near water channels.

Athar 122, Buhara.


Flowering & Fruiting: November - March.

Common weed in fields, along road sides and also on walls.

Athar 465, Bijnor.


Erect, annual herb. Stem angular, ribbed. Leaves fleshy, ovate, elliptic-oblong, coarsely serrate-dentate. Flowers in paniculate
clusters. Perianth segments 5, with a broad, green band. Stamens 5.
Utricle depressed, globose, finely papillate, single seeded. Seeds
compressed-lenticular, dark-brown, shining, smooth.

Flowering & Fruiting: December–March; May–July.

Abundant in wheat fields.

Athar 212, Jhalu.
LXXXVI- BASELLACEAE

_Basella Linn._

_Basella alba Linn._ var. _rubra_ (Linn.) Stewart, Punjab Plants, 177, 1869; Tenjari et al. in Ind. Jour. For. 5(25):152, 1962.


An extensive climber with purple fleshy stem and succulent leaves. Leaves ovate, obtuse, entire, cordate at the base. Flowers in cymose clusters forming spikes, purple in colour, sessile. **Perianth** fleshy, connate basally, purple. **Seeds** black.

Flowering & Fruiting: October-March.

Cultivated in kitchen gardens. The leaves locally known as "Pai-Ka-Saag" are made into curry.

Athar 23, Nai Basti.
LXXXVII- Polygonaceae

Key to genera:

Erect or ascending herbs.

Stem terete (not flat); leaves well developed.

Perianth lobes 4-5, none of them accrescent in the fruit; stigma capitellate

1. Polygonum

Perianth lobes 6, 3 inner accrescent in the fruit; stigma fimbriate

2. Rumex

Stem flattened, with distinct transverse lines (resembling the mature segments of a tape worm), leaves caducous; flowers pink

3. Huelklenbeckia

Climbers with pink or white flowers; the axis of inflorescence gets transformed into tendril

4. Antigone

1. Polygonum Linn.

Key to species:

Flowers axillary, pink; small prostrate or ascending herbs; branches growing in all directions from a woody base

1. P. plebeium

Flowers in spikes.

Spikes dense (flowers close set).

Nutlets biconvex.
Braeats hairy; leaves ovate;
petiole quite long; plant

green ............................. 2. P. orientale

Braeats glabrous; leaves
lanceolate, petiole short;

plant tinged with red ............. 3. P. glabrum

Nutlets trigonous; braeats glabrous.

Ochrea long ciliate (cilia
longer than the tube) ............. 4. P. barbatum

Ochrea truncate, ciliate ........... 3. P. glabrum

Spike lax (flowers distant),
filiform; leaves and perianth
densely gland punctate; nut

trigonous, granulate ............... 5. P. hydropiper

1. Polygonum plebeium R. Br. Prodr. 420, 1810; FBI. 5:27, 1886;
3, 8:140, 1927; Steward, Contrib. Gray Herb. 5(88):24, 1930; HFDD.

Prostrate or decumbent herbe; internodes long or short; ochrea
white, ciliate. Leaves small, oblong-lanceolate. Flowers 1-5 in
axile, shortly pedicelled, pink; each perianth lobe with a green
median streak. Nutlet 3-gonous, polished.

Flowering & Fruiting: October-April.

Abundant in damp localities, sometimes also on old walls.

Ather 42, Near Railway Station.
Polygonum glabrum Willd.


Flowering & Fruiting: Rainy season.

Rare, collected only once from the bank of Ganga. This plant grows in Dehradun and it seems that seed were washed down to this area and germinated.

Athaner 197, Jalalpur.


An erect glabrous annual, lower part of the stem ascending and tinged with red. Leaves lanceolate, acute, entire, narrowed at the base, gland dotted. Oehrea conspicuously veined, tightly appressed to the internode, eciliate. Racemes erect; bracts glabrous. Perianth white or pink, not glandular. Stamens 6-9, Styles 2 or 3. Nutlets dimorphic, in case of 2-styled flowers the nutlets are biconvex and in case of three styled flowers the nutlets are trigonous.

Flowering & Fruiting: Rainy and winter season.

Abundant in road-side ditches and near marshy places.

Athaner 27, Kherajpur.

Key to subspecies:

Leaf base acute; lamina without any blotch ........................................ 1. P. barbatum
  subsp. barbatum

Leaf base usually rounded and lamina blotched with brown ............... 2. P. barbatum
  subsp. gracile

1. Polygonum barbatum Linn. Sp. Pl. 362, 1753; FBI. 5:37, 1886;
   NFDD. 441, 1977,

Polygonum stagninum Buch.-Ham. ex Boiss. in Wall. Pl. As. Bar.

An erect annual herb, lower part creeping and rooting at the nodes,
nodes thickened. Cyme appressed, subescent; mouth ciliate with
cilia longer than the tube. Leaves lanceolate, entire, base acute,
apex acute or acuminate. Racemes usually combined into panicles.
Perianth white or pink, glandular, Nutlet trigonous.

Flowering & Fruiting: Winter season.

Common in marshy or damp localities.

Athar 192, Hemrajpur.

   Buit. Ser. 3, 8:146, 1927.

Polygonum flaccidum Roxb. Pl. Ind. ed. Carey 2:291, 1832 (non
   Boiss. in DC. 1836); Gage, Rec. Bot. Surv. Ind. 2:399, 1903.
**Polygénenum serrulatum** Senex Hook, f. FBP. 5:138, 1886 \( \nonumber \) (non Legase), excl. var. dentii Hook. f. \( \nonumber \).

**Polygénenum barbatum** Linn. var. gracile (Danser) Steward, Contrib. Gray Herb. 5(88):55, 1930.

This taxon differs from the preceding one in the leaves which are rounded or subcordate at the base and the blade with brown blotch. Not uncommon, found in marshy localities and near the banks of the Ganges.

Athar 741, Rawdi Chat.


Flowering & Fruiting: October-March.

Common, near water channels and ponds.

Athar 160, Barrage Road.

2. **Rumex Linn.**

Key to species:

Plant robust; leaves not hastate at the base; inner fruiting tepals not pink .......... 1. **R. dentatus**
Plant slender; leaves hastate at the base; inner fruiting tepals pink .......... 2. R. hastatus


Rumex klotzschianus Helsing. in DC. Prodr. 14:37, 1856.


An erect, branched or simple annual. Stem sulcate, purple below. Lower leaves petiolate, oblong, narrowly obovate, obtuse, base narrow or cordate; margins entire, the length of petiole decreases gradually towards the apex. Flowers in axillary whorls, combined into panicles, pedicels deflexed, inner fruiting tepal denticulate. Nut trigonous.

Flowering & Fruiting: January-May.

Abundant, near water bodies.

This plant forms dense and nearly pure vegetation near water. After fruit maturation entire plant turns rusty red and can be easily made out from distance.

Athar 241, Near Sugar Mill.


This species can be very easily distinguished from preceding one, by its slender habit, hastate leaves and pink inflorescence.
Flowering & Fruiting: Winter.
Rare. Occasionally found on damp old building walls.
Athar 519, Mandawar.

3. Muehlenbeckia Heissen.

Flowering & Fruiting: September-November.
Cultivated in gardens.
Athar 178, Vardhman P.G. College, Bijnor.

A large extensive climber. Leaves ovate-cordate, entire. Flowers in axillary racemes terminating by a branched tendril, pink in colour; 3-outer perianth lobes larger. Achenes enclosed within perianth lobes, 3-angled.
Cultivated abundantly, found as escape also.
Athar 170, S.F. Residence, Bijnor.
LXXVIII- Aristolochiaceae

Aristolochia Linn.


A medium sized climber. Leaves simple, alternate, reniform-cordate, petaled. Flowers solitary-axillary, pendant, the pedicle longer than the petiole; bracts orbicular. Perianth tube greenish-yellow; limb expanded, shallowly saucer shaped, cordate at the base; throat purplish-brown, surrounded by purplish-brown and violet streaks. Stamens 6; anthers sessile. Fruit a capsule, dark-brown, hexagonal. Seeds brown, flattened.

Flowering & Fruiting: August-November.

Planted in gardens.

Athar 496, Vardhaman I.I. College.
Piperoniæa Ruiz. & Pav.


Piper pellucidum Linn. Sp. Pl. 30, 1753.


Flowering & Fruiting: January-March.

Occasionally found in shady and moist places. This is a very common plant in forest of Jafribad near Najibabad.

Ather 436, Husainpur.
Cinnamomum (Tourn.) Linn.


A medium sized tree with straight stem. Leaves alternate, ovate-elliptic, acuminate, pinkish when young; buds scaly. Flowers small yellow in axillary panicles. Fruit a drupe.

Flowering: Summer season.

Cultivated. There is only one tree in the botanic garden of Vardhman P.G. College, Bijnor.

Athur 717, Vardhman P.G. College, Bijnor.

This plant can be readily identified because of its characteristic scaly buds and the leaves which possess camphor like smell. The smell persists even in dried leaves.
Grevillea R. Br., nom. cons.


Flowering & Fruiting: March-August.

Planted in parks and gardens. Leaves of this plant are used to decorate the entrance of the house during the marriage ceremonies among Hindus.

Athar 638, Ejaz Ali Hall.
Dendrophthoe Hart.


_Loranthus falcatus_ Linn. Suppl. 11, 211, 1701.

_Loranthus longiflorus_ Boer. in Linn. Encycl. 3: 520, 1709; Fuc. 5: 214, 1806; Fuc. 2: 175, Rep. ed. 1900.


Flowering & Fruiting: November-April.

Common, parasitizes on _Acacia religiosa, Mangifera indica, Psidium guajava, Dalbergia sissoo_ and _Albizia lebbeck_ etc.

Ather 30, Barrage Road.
Key to genera:

Trees.
Leaves broad; flowers in spikes; capsule
3-seeded, covered with red resinous

glands ........................................ 1. Mallotus
Leaves narrow; flowers axillary; fruit
fleshy.
   Fruit 1-seeded, not acidic .................. 2. Putranjiva
   Fruit 6-seeded, acidic .................... 3. Emblica

Shrubs or herbs (some Euphorbiaceae assume tree
like dimensions).

Inflorescence a cyathium.
   Involucre regular, without a lateral
protuberance ........................................ 4. Euphorbia
   Involucre not regular, with a lateral
protuberance ........................................ 5. Pedilanthus

Inflorescence not a cyathium.
Leaves palmately lobed; plant without
milky latex.
   Fruit a spiny capsule, usually
3-valved; seeds carunculate;
leaf margins not ciliate .............. 6. Ricinus
   Fruit a smooth capsule; leaf
margins ciliate ................................. 7. Jatropha

Leaves not palmately lobed.
Flowers with petals ...................... 7. Jatropha
Flowers without petals.

Whole plant densely stellately tomentose;
a prostrate herb ................. 8. Chrozophora
Clabrous or without stellate hairs.

Flowers in leaf axils,
not in definite raceme
or spike.

A shrub with distant leaves and purple berry ............... 9. Kiryanelia

A herb with close set leaves and 3-seeded capsule ....... 10. PhyBanthus

Flowers in definite spike or raceme.

Male and female flowers in the same spike.

Female flowers not subtended by dentate, cupular bracts; a herb with scruffy depo-
sition and strong smell ............... 11. Crotan
Female flowers
subtended by
dentate cupular
bracts; a slightly
hairy herb; with-
out any smell ....... 12. Acalypha

Male and female
flowers in separate
spikes; shrubs; leaves
variously coloured,
and spotted, coriacea-
ous ........................ 13. Codium

1. Mallotus Lour.

Mallotus philippensis (Lamk.) Muell.-Arg. in Linnaea 34:196, 1865;
Fl. Croton (Philippense Lamk. Encycl. 2:206, 1786); FdI. 5:442,
1887; FUGs. 2:210, Repr. ed. 1960; Ind. Tr. 590, 1906.

A small evergreen tree; bark ashy grey, Leaves alternate, simple,

glabrous above, puberulous below, oblong to elliptic, entire. Male
flowers subsessile, in erect terminal spikes. Sepals 3–4 lanceolate.

Stamens many; anthers with red glands at the top. Female flowers

sessile in short spikes. Calyx same as above. Ovary 3-celled;

1-ovule in each locule, red glandular and stellate tomentose. Fruit

a globose capsule, covered with brick red resinous glands. Seeds

subglobose, black.

Flowering: September-January.

Fruiting: March-May.
Rare, found occasionally near the villages.

Athar 274, Fazalpur.

2. *Putranjiva* Wall.


Flowering & Fruiting: March-February.

Not uncommon, planted near the temples. Department of Social Forestry has, recently, planted at some places.

Athar 732, Vidur Kuti.


*Physillanthus emblica* Linn. Sp. Fl. 982, 1753; FBI. 5:289, 1887.

*Some authors treat this taxon as a species of Drypetes and, then, it is named as Drypetes roxburghii (Wall.) Hurusama.*
A medium sized, deciduous tree. Bark pale-brown exfoliating into irregular flakes. Leaves linear-oblong, mucronate, light-green above, paler beneath. Male flowers pedicellate. Stamens 3; filaments connate to form a column; anthers apiculate. Female flowers subsessile. Fruit pale-green with ashy white markings, depressed globose. Seeds plano convex or asymmetrically trigonous, dark brown.

Flowering & Fruiting: March-December.

Abundant, usually planted on the fences of the gardens.

Athar 323, Vidur Kuti Road.

4. Euphorbia Linn.

Key to species:

Plants spiny.

Erect shrubs; bracts not petaloid.

   Stem 3-angled; spines paired in straight rows; leaves minute caducous ........................................ 1. E. antiquorum

   Stem terete; spines paired, spirally arranged; leaves large obovate, not caducous ...................... 2. E. neriifolia

Ascending shrub; spines long, scattered all over the stem; bracts red ............... 3. E. milii

Plants without spines.

Trichotomously branched, branches cylindrical, smooth, straight; leaves small ............................................... 4. E. tirucalli
Plants otherwise with well developed leaves.

Shrubs; upper leaves (bracts)
large deep-red or pink .............. 5. \textit{E. pulcherrima}

Herbs; upper leaves not differently coloured.

Leaves alternate in the lower part of the stem.

Leaves linear lanceolate.

Involucre glabrous outside, hairy within ........ 6. \textit{E. dracunculoides}

Involucre glabrous both within and without;
base woody ..................... 7. \textit{E. prolifera}

Leaves obovate, spatulate, entire near the base and serrate towards the top ....... 8. \textit{E. helioscopia}

Leaves opposite.

Erect or ascending herbs;
leaves more than 1 cm long.

Gland appendage
petaloid, conspicuous ...... 9. \textit{E. hypericifolia}

Gland appendage not petaloid, inconspicuous ................. 10. \textit{E. hirta}

Prostrate herbs; leaves
less than 1 cm long.
Leaves crenate; seeds
furrowed ................. 11. *E. thymifolia*
Leaves entire; seeds
faintly pitted ............. 12. *E. granulata*


A large dark-green shrub, with milky latex; branches 3-angled (winged) the wings sinuately repand-crenate; spines paired at each protuberance of the wing. Leaves small, nearly orbicular, caducous. Flowering: March-April.

Cultivated in gardens as ornamental, and on the edges of gardens as an effective fencing.


Easily distinguishable from above species by pale green colour; cylindric branches; spirally arranged spines and the leaves which are larger, clustered towards the end of branches, fleshy and ovate-oblong.

Flowering: February-April.

Emergence of new leaves: Rainy season.

Commonly planted as ornamental and for fencing.

Euphorbia mili Ch., des Moulins


Flowering: Nearly round the year.

Cultivated in pots and rockeries.


A large shrub or small tree; branches fragile, herbaceous, fleshy, cylindrical. Leaves linear lanceolate, fleshy, caducous.

Flowering: Does not flower in the area.

Cultivated for ornamental purposes, often as an indoor plant.


A large shrub with many stems from the base, older parts of the stem yellowish-brown, with prominent leaf scars. Leaves ovate-elliptic, entire or sinuate toothed or lobed; bracts leaf like, mostly red, but may be pink or white depending on the variety. Involucres yellowish green, gland orange-yellow, apex fissure like.

Flowering & Fruiting: December-March.

Cultivated in gardens.

Athar 749, Industrial Estate.


Flowering & Fruiting: December-June.

Not common. A weed of wheat and barley fields.

Athar 140, Gajraula.


Flowering & Fruiting: March-June.

Common, found in fields and waste-lands. Prefers sandy soil.

Athar 127, Barrage Road, Bijnor.


An annual with ascending branches; older parts of the stem light to dark-purple. Leaves alternate, sessile, pandurate, apex rounded; basal half entire, apical half serrate. Inflorescence cyathium, there are five flowering shoots at the end of each branch arranged unambiguously, with a cyathium in the centre of the umbell; involucre leaves broadly obovate, smaller and unequal sided; glands 4, flat topped and oval in cut line, interglanular area fimbriate. Gynoecy glabrous; styles 3, each again bifurcated near the apex. Seeds obovoid, dark-brown, deeply reticulate and with a white strophiole.

Flowering & Fruiting: September-April.

Uncommon, occasionally found on the raised borders of the fields. Ather 31, Bhatan, from a vegetable field.


Euphorbia parviflora Linn. Syst. Nat. ed. 10. 1047, 1759.


Flowering & Fruiting: August-December.
Abundant, mainly found in sugarcane fields.
Athenar 18, Barrage Road.


*Euphorbia pilulifera* auct. pl. (non Linn. 1753); BCI. 5:250, 1887.


A prostrate or ascending annual herb. Stem hairy, hairs of two types one spreading and red-purple in colour, the other appressed and yellowish-white. Leaves oblong, sparingly hairy, often with a reddish brown spot above. Cycad in axillary cymes. Involucral glands minute, 4-5 in number, flat topped, limb very small or obsolete. Capsule appressedly pubescent. Seeds quadrangular-oblong, minutely ribbed, reddish-brown.

Flowering & Fruiting: Nearly round the year.

Abundant, found on road sides, wasteland, agricultural fields and old walls.

Athenar 109, Jain Farms.


A prostrate annual herb, more or less hispidly hairy. The whole plant often with a pale coppery tinge. Leaves small opposite,
obliquely oblong or elliptic-oblong, glabrous above, sparsely pilose beneath. Cyathia axillary, solitary or 2-3 together; glands minute, red, limb none, interglandular space hairy. Capsule obtusely keeled; keel hairy. Seeds quadrangular, bluntly pointed and with 5-6 transverse, shallow furrows.

Flowering & Fruiting: July-November.

A very common weed.

Ather 1, Mandawar.


May be distinguished from E. thymifolia by serrulate leaves; cocci not keeled and the seeds faintly pitted.

Flowering & Fruiting: August-March.

Abundant, a very common weed.

Ather 141, Bijnor Inter College, Bijnor.

5. Pedilanthus Neck.


A succulent herb, branching from the base; stems often zigzag.

Leaves ovate to ovate-lanceolate, acute, entire, dark-green (white margined varieties also under cultivation). Cyathia in dense terminal cymes; the bright-red involucr glabrous, with a lateral protuberance; style and stamens exerted.

Flowering: Cold season.

A very common plant for hedging.
Ricinus communis Linn.


Flowering & Fruiting: Nearly round the year.

Cultivated, often found as an escape near the villages growing on the heaps of manure.

Athar 521, Begawala.

7. *Jatropha* Linn.


A dark-purple tinged shrub. Leaves ovate with a cordate base, divided less than half way down, 3-5 palmatifid; margins ciliate with stalked glands. Flowers in terminal, corymbose cymes, monoecious, 5-merous. Sepals 5, glandular along the margins. Petals deep-red with prominent veins. Stamens 6-10, filaments connate at the base. Fruit 3-seeded capsule, trigonous. Seeds ellipsoid, dark-brown, carunculate.

Flowering & Fruiting: June–December.
Rare, occasionally found on the edges of orchards.
Ather 288, Baldaur.

Jatropha hastata Jacq. (= J. panduracfolia Andr.) is a common garden shrub. Leaves undivided, dentate near the base, the base slightly hastate, flowers red.

Flowering & Fruiting: Rainy & winter season.

9. Chrozophora Neck

Chrozophora prostrata Dalz. in Dalz. & Gils. Bomb. Fl. 233, 1861;

A prostrate herb, densely stellate tomentose; branches radially spreading, often reddish-brown. Leaves broadly ovate, elliptic. Flowers in axillary and terminal racemes. Capsule stellately woolly.

Flowering & Fruiting: March-July.

Rare, occasionally occurs in dry ditches.
Ather 442, Chandpur.


Phyllanthus reticulatus Poir in Lamk. Encycl. 5:298, 1804; FBI.

A much branched shrub, branches reddish tinged. Leaves oval-oblong, cuneate, rounded; stipules triangular, lanceolate. Flowers in axillary cymes. Male flowers purplish; stamens 5, inner three larger
and connate and outer 2 shorter and free; anther cells divergent. Female flowers every 3-6 celled; style and stigma short. Fruit a globose dark-purple berry. Seeds trigonous, greenish, black, colliculous.

Flowering & Fruiting: February-December.

Abundant, near villages, in orchards etc.

Athrow 433, Pada.

10. Phyllanthus Linn.

Key to species:

Branches ascending from the base, suffused with red; stipules ovate triangular; seeds transversely ribbed on the back ........................................ 1. P. urinaria

Branching not from the base; plant green; stipules lanceolate, subulate; seeds longitudinally ribbed on the back ................................................................. 2. P. fraternus


An erect or ascending herb, branched from the base. Stems suffused with red, branches 3-gonous, margined. Leaves petioled, oblong obovate; base cuneate-rounded and slightly oblique, purple along the margins. Male flowers 1-3 in the leaf axil; stamens 3. Female flowers solitary in the leaf axil. Fruit densely warty. Seeds brown, transversely ribbed on the back.
Common in fields and particularly among the stone blocks at Madhya Ganga Barrage.

Ather 386, Barrage.


Easily distinguishable from above species, by its green colour, the branches which are not basal but cauline and the seeds which are longitudinally ribbed on the back.

Flowering & Fruiting: July–December.

Abundant, in gardens, lawns, cultivated fields etc.

Ather 19, Jhalu Road.

11. *Croton* Linn.

*Croton bonplandianum* Baillon, Adansonia. 4:339, 1864; HFDD. 456, 1977.


An erect profusely branched herb, with a strong smell; younger parts with scurfy deposition, branches stellate hairy. Leaves ovate-lanceolate, acute, serrate, petiolated. Flowers in terminal racemes; female near the base and male towards the apex. Male flowers in clusters of 2–3; stamens 12–15; anthers 2-celled. Female flowers solitary, subsessile with 2-prominent disk shaped glands at the base of pedicel; every 3-celled, stellately pubescent; style 3, bifurcating into 6 stigmas. Seeds dark-brown, oblong, carunculate.
Acalypha indica Linn.

Flowering & Fruiting: May-December.

Abundant in wastelands, along road sides and Railway tracks.

Athar 109, Railway Station, Bijnor.

12. Acalypha Linn.

Key to species:

Leaves rhomboid; both leaves and
spikes green, wild .......................... 1. A. indica

Leaves ovate; both leaves and
spikes red, cultivated ....................... 2. A. wilkesiana

1. Acalypha indica Linn. Sp. Pl. 1003, 1753; FHL. 5:416, 1887;

An erect branched herb, Stem striate, hairy. Leaves long petioled,
ovate rhomboid, cuneate, shallowly serrulate. Flowers in axillary
and terminal spikes, often terminated by an abnormal T-shaped
flower. Male flowers in the upper portion of the spikes; stamens
5-3, free. Female flowers in the lower portion of the spike, sub-
tended by well developed subcupular, obliquely mouthed bracts.
Ovary 3-celled; styles 3, multifid into filiform segments. Seeds
ovoid, light-brown, finely reticulate, carunculate.

Flowering & Fruiting: September-April.

Occasionally found in moist and shady conditions.

Athar 592, Near Vidur Kuti.

2. Acalypha wilkesiana Huell.-Arg. in DC. Prodr. 15(2):817, 1866;
**Acalypha tricolor** Seem. Fl. Vit. 223, 1867.

A much branched dense shrub. Leaves elliptic, ovate, shortly acuminate, rounded at the base, variously mottled with shade of red; the plant turns brick-red in cold season. **Spikes** slender, reddish.

Flowering: January-July.

Commonly planted in parks and lawns.

Athin 523, Catholic Church Compound.

*Acalypha hispida* Burm. f. is another species under cultivation and can be easily identified by its long (longer than leaves), pendulous red spikes and green leaves.

13. **Codiaeum** Juss.

This genus includes the "Croton" of nurserymen and differs from the genus *Croton* in having male and female flowers in separate spikes.


Mostly shrubby, glabrous; latex watery; leaves ovate-lanceolate to linear, sometimes crowded at the ends of the branches, mottled with white, yellow or red. This species exhibits a tremendous variation in the size, shape and variegation of the leaves.

Flowering & Fruiting: Rainy and winter season.

Commonly cultivated.
**Pouzolzia** Gaud.

Key to species:

Glabrous herbs; fruits winged ................. 1. **p. pentandra**

Strigose herbs, stipules often with long apical cilia; fruits not winged ................. 2. **p. seylanica**


**Memorialis pentandra** ( Roxb.) Decd. in DC. Prodr. 16:233, 1869.


A perennial, marshy herb, branching from the base. Stem red, somewhat angular with appressed, scattered hairs. Leaves variable in shape, linear-lanceolate or ovate-lanceolate, acute, punctate above; stipules triangular-deltoid. Male flowers shortly pedicellated; perianth lobes 5, cup-shaped, hooked-hairy. Stamens 5, antitepalous; filaments incurved in bud. Female flowers sessile; perianth lobes 2, tubular, ascrescent. Fruit with 3 wings, two larger in the same plain the third at right angle to them and smaller. Seeds black, shining, ovate and with an acute apex.

Plants associated: **Cyperus difformis**, *Eleocharis palustris*, *Basella monnieri*, *Sagittaria sagittifolia*. 
Flowering & Fruiting: Nearly throughout the year.

Two morphologically distinct forms of this taxon, one with longer internodes, larger leaves and 3-4 male flowers in each cluster; the other with shorter and close set leaves and 1-2 male flowers in each cluster, grow together. Biosystematic studies are needed to determine the relationship between these two forms.

Ather 510, Jajpur.


*Parietaria zeylanica* Linn. sp. li. 1052, 1759.


An erect or ascending herb. Stem purple tinged, grooved, strigose. Leaves petiolate, entire, acute or acuminate, opposite or alternate; nerves obscure adaxially but distinct abaxially, basal nerves three and one pair in the middle; stipules acuminate and usually with 2-3 long, apical cilia. Fruits ribbed, reddish, strigose. Seeds ovate, painted at one end, smooth, shining, cream coloured (probably seeds in my specimen were not fully ripe).

Flowering & Fruiting: Rainy season.

Duthie described this taxon as abundant within the area, but I could collect it only once.

Ather 437, Jajpur.
Key to genera:

Male and female flowers in the same inflorescence.

Flowers on the inner wall of a fleshy receptacle, gall flowers present ........ 1. Ficus

Male and female flowers in different inflorescence.

Stamen 1, fruits tubercled or lobulate ................................. 2. Artocarpus

Stamens 4, fruit a sorosis ............... 3. Morus

1. Ficus Linn.

Key to species:

Receptacles sessile.

Leaves very unequal at the base, very scabrous, black when dry.

Receptacles on special, leafless branches which usually originate from the main trunk ................. 1. F. cunia

Leaves neither unequal at base nor scabrid, receptacles on leafy branches.

Branches with at least few aerial roots.

Leaves broadly oblong-ovobic, coriaceous, apex rounded, grey

hairy at the nerves beneath ...... 2. F. benghalensis
Leaves oblong lanceolate,
apex abruptly shortly acuminate, not coriaceous ............. 3. F. virens
Branches without aerial roots.
Leaves cordate, long caudate, glabrous ......................... 4. F. religiosa

Receptacles stalked,
A shrub with hispid, orbicular-ovate or obtusely 3-5 lobed leaves, receptacles solitary on ordinary branches ...... 5. F. palmata
A tree with leaves glabrous above and softly pubescent and pellucid punctate beneath, ovate-lanceolate or oblong-ovate; receptacles in clusters on short, thick, scaly, leafless panicked branches from the trunk, rarely axillary ............ 6. F. racemosa


Ficus conglomerata Rend. Fl. Ind. 3:559.

A medium sized tree. Leaves alternate, petioled, entire, acute, semicordate; upper surface scabrid, pubescent beneath. Receptacles sessile, paniculate on special branches which arise from the main trunk; reddish brown and ribbed when ripe; basal bracts three.
Males sepals 3. Female sepals 4. Achenes broadly ovoid, emarginate on one side, tubercled.
Flowering & Fruiting: February–September.

Occasionally found along the Ganga.

Athar 734, Jalalpur.


A large ever green tree, branches with aerial roots, which ultimately reach the ground. Bark smooth, grey. Leaves alternate, ovate-ovibicular coriaceous, entire; younger leaves pubescent; older leaves pubescent on the nerves beneath. Receptacles sessile in axillary pairs; red when ripe. *Male* perianth 4-lobed. *Stamen* 1.

Flowering & Fruiting: May–July.

Commonly planted as a shade tree.

Athar 653, Session Court premises Bijnor.


Flowering & Fruiting: April–June.

Commonly planted for shade on road sides and in villages near Chaupal.

Athar 189, Vidurkuti.


*Urostigma religiosum* Cass. Ric. Caprif. 82. t. 7. ff. 1–5, 1845.

Flowering and Fruiting: April to June.
Commonly found in vicinity of temples.

Ather 543, Vidur Kuti Road.


*Ficus corioides* Roxb. Fl. Ind. 3:529, 1832.

A large shrub with spreading branches. Leaves alternate, hispid-hairy, ovate-cordate, or obtusely 3-5 angled, crenate-dentate. Receptacles peduncled, solitary, axillary, pubescent, pyriform. Male flowers pedicelled, pedical hairy; perianth lobes 4-5, hairy. Stamens usually four, filaments hairy. Female flowers and Gall flowers mixed. Ovary obliquely ovoid. Style short, lateral, stigma compressed.

Flowering & Fruiting: May–December.

Often found in waste-land, and near the water channels.

Ather 40, Shakarpuri.


*Ficus geleanorae* Roxb. Fl. Ind. 3:538, 1832.


A tall tree; bark smooth, reddish brown. Stem usually buttressed, young parts pubescent. Leaves alternate, petioled, ovate, oblong,
acute, subacute, entire, slightly pubescent beneath and glabrous above when fully mature. Receptacles on special, thick, panicked branches. Male flowers sessile, oedialer; perianth 3–4 lobed.

Stamens 2, rudimentary carpel present. Female flowers subsessile or sessile, numerous; perianth lobes 4–5, reddish brown, style deep pink. Call flowers pedicellate. Ripe receptacles reddish brown.

Flowering & Fruiting: August-January.

Commonly cultivated.

Athar 574, Chah Sheerin.


Key to species:

Fruit of the size of an apple, velvety, lobulate, soft and yellow orange ............... 1. A. lakoocha

Fruit very large, tubercled ......................... 2. A. heterophyllus


Flowering & Fruiting: March-September.
Cultivated for the sake of fruits.
Athar 493, Jhalu Road.

2. 

Artocarpus integrifolia auct. non. Linn. f.

Differs from the preceding species in having leaves relatively smaller, pellucid-punctate abaxially as well as adaxially. Development of the flowers from the main trunk and older branches. Fruits quite large and tubercled.

Flowering & Fruiting: February-November.

Cultivated for the sake of fruits which are made into curry.
Athar 708, Jain Nursing Home.

3. 

Morus Linn.


Morus laevigata Wall. ex Hook. FRI. 5:492, 1888.

A medium sized tree. Bark light grey. Branches lenticellate, flexible and strong. Leaves broadly ovate, 3-5 lobed, rough on both surfaces, serrate. Flowers dioecious, emerge before the leaves. Male catkin lax flowered, cylindric, stamens 4, filaments incurved. Female catkin linear, pendulous; perianth 4-lobed, becoming juicy in fruit; ovary compressed, styles 2, unequal. Fruit a septic, juicy, green or purple, sweet.

Flowering & Fruiting: February-May.

Commonly cultivated for the sake of fruits and the branches which are used to make baskets.
Athar 700, Bukhara.
**Halepoteles Planch.**


A medium sized, deciduous tree with drooping branches. **Bark** grey or light-brown, exfoliating in quadrilateral flakes. Leaves alternate, elliptic-ovate, acuminate, distantly toothed, stipulate. **Flowers** from the leaf scar of previous year shoots. **Perianth** segments 4-6, connate basally, campanulate, hairy. **Stamens** 8 in male and 9 in 2-sexual flowers. **Ovary** compressed; **style-1, 2-fid**, deep reddish-brown. **Fruit** o suborbicular, 2-winged samara, notched at apex, wings reticulate.

**Flowering & Fruiting:** March-June.

**Commonly planted on road sides.**

**Athar 561, Mission Compound.**

The flowers appear before the emergence of new leaves. **Fruit setting takes place within few days of flowering** and then the leaves start emerging.
Cannabis Linn.


Cannabis indica Linn. Encycl. 1:693, 1783.

Erect, much branched herb. Leaves 3-8 foliáte; leaflets narrowly lanceolate, serrate, glandular pubescent. Male flowers perianth lobes basally connate, 5, greenish-yellow. Stamens 5, free, antiphyllous. Female flowers enclosed by prominent bracts, glandular pubescent; ovary 1-celled; style 1; stigma usually unequally lobed.

Flowering & Fruiting: December-May.

Abundant in waste places and on road-sides.

Ather 117, Mandawar Road.
XCVIII- CASUARIACEAE

Casuarina Linn. ex Adans.


Casuarina muricata Roxb. Fl. Ind. 3:519, 1832.

A medium sized tree with a straight trunk and drooping branches. Crown conical, not very dense. Leaves minute, scaly, 6-9 (depending on the number of furrows on the branch). Male flowers in spikes on lateral branches, bracteate and bracteolate. Perianth lobes 2, free, minute. Stamens 1, filament hairy. Female flowers in ovoid heads, flowers spirally arranged. Ivary 2-celled, ovules 2, style red, bifid. Fruit apically winged samara.

Flowering & Fruiting: February-August.

Planted in gardens.

Ather 551, Jain Ram.
Salix Linne.

Salix tetrasperma Roxb. Fl. Cor. 1:66, t. 97, 1798; FBl. 5:626, 1883;

A small sized tree. Branches drooping and flexible. Bark grey,
longitudinally fissured. Leaves simple, ovate-lanceolate, minutely
serrate, green above, white beneath. Flowers unisexual, on different
trees, in catkins, bracteate, fragrant. Stamens 4-8 (-10), unequal,
filaments hairy. Ovary 1-celled, ovoid-oblanceolate conical, stigma
2-lobed.

Flowering & Fruiting: September-March.

Found along the banks of Ganges, but not frequent.

Athar 680, Near Jalalpur.

*Populus nigra* Linn., locally called as "Poplar" has been introduced
only few years back. It is planted on commercial scale for the wood
which is used in match industry. Never seen in flowering.
C. CERATOPHYLLACEAE

**Ceratophyllum** Linn.


*Ceratophyllum verticillatum* Roxb. Fl. Ind. 31624, 1832.

A branched, rough, submerged hydrophyte. **Leaves** whorled, usually 5-10 in a whorl, bifid near the apex, segments toothed (rendering the plant slightly rough). **Flowers** solitary—axillary, sessile. **Male flowers** with 10-15 perianth segments and 10-20 stamens. **Female flowers** perianth same as in male; ovary sessile, 1-celled; style 1; stigma 1, with a lateral pouch. **Fruit** a laterally compressed achene, with 2 soft spines near the base and persistent style.

**Flowering & fruiting:** September-February.

**Abundant in ditches, ponds and streams.**

Athar 737, Ganj.
CL, HYACCHITACEAE

Key to genera:

Leaves radical or crowded near the base.

Leaves petioled, broadly ovate;
flowers large, bisexual; pedicel
not coiled .............. 1. Ottelia
Leaves sessile, ribbon like; flowers
minute, unisexual, female pedicelled;
pedicel coiled .............. 2. Vallisneria

Leaves cauline.

Leaves long, ribbon like, narrow,
alternate, margins undulate;
female spathe sessile .............. 3. Neochmannara
Leaves short, whorled, margins
not undulate; female spathe
long peduncled .............. 4. Hydrilla

1. Ottelia Pers.

Ottelia aliameides (Linn.) Pers. Syn. Fl. 1:400, 1805; Fl. PL. 5:662;


A submerged, rooted hydrophyte; upper leaves larger and ovate-
lanceolate, while lower ones are smaller and shortly petioled, ovate,
cordate at the base. Flowers white, bisexual, rising above the water
surface. Spathe glabrous, 3-winged. Petals plicate in the bud,
obovate, rounded. **Stamens** 6-8; filaments hairy. **Seeds** oblong.

Flowering & Fruiting: July-February.

Abundant in ponds and ditches.

Athar 329, Muzaffar Nayar Road.

2. **Vallianeria** Linn.

**Vallianeria spiralis** Linn. Sp. Pl. 1015, 1753; FRI. 5:660, 1888;

A grass like, stoloniferous, rooted hydrophyte, size variable. **Leaves** linear, ribbon like, flaccid. **Male flowers** minute, numerous, enclosed in an ovoid spathe. **Perianth lobes** 3. **Stamens** 1-3. **Female flowers** solitary, spathe tubular; pedicel long, coiled. **Carpels** 3. **Ovules** many on parietal placentae. **Stigmas** 3, subcapitate.

Flowering & Fruiting: September-March.

Abundant in ditches and ponds.

Athar 738, Madhya Ganga Barrage.

3. **Nechamandra** Planch.

**Nechamandra alternifolia** (H. & S.) Thwaites, Enum. Pl. Zeyl. 332, 1864;


Flowering & Fruiting: Rainy and winter season.

Fairly common in ponds.

Ather 739, Barrage Road.

Govindarajulu (1984) has studied the flowers of Nuchanandra alternifolia critically. On the basis of presence of an staminode, he is of the opinion that this plant is Lagarosiphon alternifolia (Roth.) Bruce. However, I have stuck to the traditional treatment of this plant, since I could not get material at a proper stage to study the flowers.


Hydrilla verticillata (Linn. f.) Doyle, Ill. t. 376, 1839; Ill. 5: 659, 1838; Suppl. 2:262, Repr. ed. 1960; Ill. 5: 475, 1977.

Serpicula verticillata Linn. f. Suppl. 416, 1781.


Flowering & Fruiting: August-January.

Abundant in ponds and ditches.

Ather 739, Ganj.
Eulophia D. Don., nom. cons.


Bletia dubia D. Don., Prodr. 30, 1825.


A tuberous, scapigorous plant, tubers oblong, brownish-yellow in colour, not thicker than the index finger. Leaves appear long after the flowering, linear, acuminate, entire. Infloresc lax. Flowers pedicelled, drooping. Sepals narrowly-oblong, acute, 6-6 nerved.

Petals spreading, narrower than the sepals. Lip 3-lobed, median lobe orbicular-quadrate, crenulate, purple, spur narrow, conical. Capsule oblong-ovovato.

Flowering & fructifying: March-April.

Found on dried sandy bed of the Ganges where it grows in association with other grasses.

Athar 94, Nadhya Ganga Barrage.
Musa Linn.

Key to species:

Pseudo-stem more than 1.5 m tall; fruits obtusely 3-angled ............................ 1. Musa x paradisiaca
Pseudo-stem not more than 1.5 m tall; fruits 6-angled ................................. 2. Musa nana

1. Musa x paradisiaca Linn. Sp. pl. 1043, 1753.
(M. acuminata x M. balbisiana; 'M. paradisiaca'); Moore, Bailey 3:165, 1957.
(M. x sapientum Linn. Syst. Nat. ed. 10. 1303, 1759 (M. sapientum).
Pseudo-stem tall, smooth, arising from the subterranean stem. Leaves long petioled, petiole channelled, lateral veins running nearly at right angle to the midrib. Flowers in drooping spikes; bracts oblong-lanceolate, deep red or dull purple. Perianth 2-seriate, outer larger, yellowish-brown; inner one membranous, nearly transparent. Stamina 6 rarely 5. Carpels 3, connate. Ovary 3-celled, inferior; style 1, stigma flattened. Fruit a berry, strongly angular.

Flowering & Fruiting: March–October.

Cultivated for the sake of fruits.


Musa x paradisiaca Linn.
This species can be easily distinguished from *H. x paradisiaca* by its dwarf habit, lighter coloured bracts, smaller and 6-angled fruits.

Flowering & Fruiting: Rainy season.

Cultivated as an ornamental plant.

*Havenala madagascariensis* Sonn. has been, recently, planted at some places. This can be readily made out by *Musa* like 2-ranked leaves, which give the plant a fan-like appearance.
Key to genera:

Leaves and ligule glabrous ...................... 1. Zingiber
Leaves tomentose below, ligule villous ........ 2. Hedychium

1. Zingiber L. nom. cons.


A rhizomatous perennial herb. Leaves simple, lanceolate, tapering at both ends, leaf sheaths prominent. Leaves and ligule glabrous.

Flowering: Not seen.

Extensively cultivated in kitchen gardens for the sake of rhizomes locally called as "Adrak".

2. Hedychium Koenig ex etz.


Flowering: December–March.

Often cultivated as ornamental.

Ather 633, Arya Nagar.
Canna Linn.


Flowering & Fruiting: August-December.

Cultivated in parks and gardens.

Other 609, Exhibition ground.
CVL- Iridaceae

Key to genera:

Under ground stem, tuniculated bulbous flowers
sessile in long spikes

1. Gladiolus

Under ground stem, rhizome; flowers
pedicelled, in dichotomously branched,
corymbose inflorescence

2. Belamcanda

1. Gladiolus Linn.


Bulb tuniculated, reddish-brown. Leaves sword shaped, distichous, many nerved. Flowers sessile, in terminal spikes, varicusly coloured; tube funnel shaped, segments unequal.

Flowering: February-April.

Occasionally cultivated in gardens.


Belamcanda chinensis (Linn.) L.C. in Montcute, Lilia. 3: t. 121, 1805; Fusc. 6: 277, 1892; Kew. 506, 1977.

Ixia chinensis Linn. Sp. pl. 36, 1753.

An erect, rhizomatous herb, leaves laterally flattened, distichous, margins hyaline. Flowers in terminal, dichotomous corymb, pedicelled. Perianth lobes not unequal, yellow, red-purple spotted, become twisted when faded. Fruits no fruit setting in the area.
Flowering: Rainy and winter season.

Often, cultivated in parks and gardens.

Ather 578, Eljaz Ali Hall.
CVII- Amaryllidaceae

Key to genera:

Stamens exerted; flowers white, pink or red.

<table>
<thead>
<tr>
<th>Description</th>
<th>Genus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scape hollow; ovules numerous</td>
<td>1. <em>Amaryllia</em></td>
</tr>
<tr>
<td>Scape solid; ovules few</td>
<td>2. <em>Crinum</em></td>
</tr>
<tr>
<td>Stamens included</td>
<td>3. <em>Zephyranthes</em></td>
</tr>
</tbody>
</table>

1. *Amaryllia* Linn.

Key to species:

<table>
<thead>
<tr>
<th>Description</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stigma 3-fid</td>
<td>1. <em>A. vittata</em></td>
</tr>
<tr>
<td>Stigma capitata</td>
<td>2. <em>A. belladonna</em></td>
</tr>
</tbody>
</table>


Annual herb with bulbous, subterranean stem. Leaves long, green, entire, appearing after the flowers. Flowers few, usually two opposite flowers open simultaneously, red and white in colour.

Flowering: May–June.

Occasionally cultivated in gardens.


Flowering: May–June.
Zephyranthes flava (Herb.) Nichol.

A. Complete plant, B. Flower, C. Stamen, D. Pistil, and E. Style showing stigma.
Zephyranthes flava (Herb.) Nichol.
This is the commonly cultivated species of *Amaryllis*. Planted in beds as well as pots.

2. *Crinum* Linn.


Flowering: September–October & February–March.

Cultivated in gardens.


Key to species:

Flowers yellow; leaves appearing with
the flowers or a little later ..................... 1. *Z. flava*

Flowers pink; leaves appearing before
flowers ............................................. 2. *Z. grandiflora*


Flowering & Fruiting: June–October.
Often found in lawns.

Ather 577, Vardhman College, Bijnor.


*Zephyranthes rosea* auct. pl. Hort. non. Lindl, 1825.


A small bulbous herb. Leaves linear. Flower solitary on a long scape. Perianth lobes 6, connate below to form a tube, segments obovate, pink.

Flowering: July-August & February-March.

Cultivated in gardens.
CVIII- ALOVACEAE

Key to genera:

Leaves fleshy, either spine tipped or yellow margined or both. Subterranean stem a rhizome.

Leaves without transverse markings.

Leaves prickly along the margins; flowers greenish-yellow, often inter-mixed with bulbils ............... 1. Agave

Leaves smooth margined; flowers white, bulbils none.................. 2. Yucca

Leaves with transverse markings, tip not spine tipped ............................ 3. Sansevieria

Leaves not fleshy; flowers in racemes, fragrant, under ground stem a tuber ............ 4. Polianthes

1. Agave Linn.

Key to species:

Leaves upto 1.5 m long; pedicel upto 1 cm long; tepals connate in the lower part ........ 1. A. cantale

Leaves upto 1.0 m long; pedicel upto 2 cm long; tepals free near to the base .......... 2. A. wightii

A stout rhizomatous herb, with a single tall scape. Stem short, woody. Leaves forming a rosette, linear-lanceolate, prickly along the margins, prickles brown, hooked; apex with a long, brown, spine. Flowers intermittent with numerous bulbls. Perianth lobes 6; greenish-yellow, linear-oblong, almost free, inner smaller, outer larger and broader. Stamens exerted, filaments red-brown spotted. Flowering: May-September.

Planted on fencing of orchards etc.

Athat 706, Adampur.


Often planted on the fences of orchards.

Athat 549, Adampur.

2. Yucca Linn.


Flowering & Fruiting: February-August.

Planted in gardens.

Athen 641, Agri House.

This plant is often mistaken for *Y. aloifolia*, which has sharply rough margined leaves.


A tufted rhizomatous herb. Leaves 2-5 in a tuft, smooth margined, without apical spine, dark green with transverse markings and yellow margins.

Often cultivated as pot plant.


*Polianthes tuberosa* Linn. Sp. PI. 316, 1753; Man. Cult. PI. 239, 1949; KHL. 513, 1777.


Flowering & Fruiting: Summer and rainy season.

Often cultivated in gardens.

Athen 588, Nai Basti, Bijnor.
CIX. LILIACEAE

Key to genera:

Leaves reduced; plants with leaf like cladodes.

Climbers; flowers not borne on cladodes .................. 1. Asparagus

Prostrate herbs; flowers borne on midrib of cladodes ............... 2. Ruscus

Leaves well developed; no cladodes.

Climbers; leaf spines transformed into tendrils .................. 3. Gloriosa

Erect herbs.

Plants with subterranean stem.

Subterranean stem a bulb;
leaves entire, not spinous;
flowers in umbels .................. 4. Allium

Subterranean stem a stolon;
leaves broad, fleshy, margin spinous; flowers in long racemes .................. 5. Aloe

Plants without subterranean stem;
flowers in racemes .................. 6. Asphodelus

1. Asparagus Linn.

Key to species:
Cladodes needle like, cladodes and branches dorsiventrally compressed, frond like ........................................... 1. A. plumosus

Cladodes acicular, curved, cladodes and branches not dorsiventrally compressed ........................................... 2. A. racemosus


A very beautiful climber; cladodes numerous, filiform, arranged in dorsiventrally compressed, compound pinnate frond, triangular in outline. No flowering in the area.

Often cultivated as ornamental.


A large deciduous climber, armed, cladodes more or less acicular, falcate. Flowers in racemes, white. Fruits red when ripe, fleshy. Seed black.

Flowering & fruiting: December-March.

Commonly cultivated in gardens.

Ather 735, District Hospital, Bijnor.

2. Ruscus Linn.


A low, dense herb with spreading branches; cladodes foliaceous,
acute, entire. Flowers greenish, borne on the midrib of the cladode. Fruiting not seen.

Flowering: December-April.

Often cultivated as pot plant.

Athar 736, Vardhman P.G. College, Bijner.

3. Gloriosa Linn.


Flowering & Fruiting: June-September.

Not uncommon, found climbing on Zizyphus sp., Saccharum bengalense and Syzygium cumini.

Athar 702, Near Ziarat of Heeran Shah.

4. Allium Linn.

Key to species:

Leaves fistular; bulb simple .................. 1. A. cepa
Leaves solid; bulb compound .................. 2. A. sativum

An annual herb. Leaves fistular, dark green, smooth. Bulb tunicated, from reddish-white to dark red. Flowers white in terminal dense, globular umbels, with intermixed bulblets.

Flowering & Fruiting: December-April.

Extensively cultivated for the sake of bulbs.

Athar 507, Kherki.


Differs from the preceding species in having solid leaves and the bulb which are composed of small bulblets or cloves (1-2 seriate), covered by a single membrane and besetting a central woody axis. Never seen in flowering.

Extensively cultivated for the sake of bulbs.

5. Aloe Linn.


A perennial stoloniferous herb. Leaves fleshy, radical, broad, tapering towards the apex, soft spinescent. Flowers red in dense racemes.

Flowering & Fruiting: February-April.

Often cultivated for ornamental and medicinal purposes.

Athar 630, Officer's colony.


Annual herb, without any bulb or stolon. Leaves many, radical, terete, acute, striate, sheathing at the base, faintly hairy, baiife in longitudinal rows. Scapes several from the base, branched above. Flowers pinkish-white, laxly racemose, solitary in each bract. Pedicels short. Perianth segments oblong, obtuse, with a brownish costa. Stamens 6; anthers yellow; filaments abruptly dilated near the base and hairy (the filaments are not equally dilated even in the same flower). Stigma trifid. Seeds black, acutely trigonous, transversely furrowed and finely granulated.

Flowering & Fruiting: Cold season.

Abundant, as a weed of wheat fields.

Ather 97, Tajpur.
Key to genera:

Petiole with an inflated bladder; flowers in a panicle up to 35 cm long; perianth with a yellow spot; longer filaments hairy ... 1. Eichhornia

Petiole without bladder; flowers in a short raceme up to 5 cm long; perianth often red spotted; filaments glabrous ......... 2. Monochoria

1. Eichhornia Kunth nom. cons.

Eichhornia crassipes (Mart.) Solms. in DC. Monogr. Phan. 4:527, 1863; Ag. Ann. 70, f. 48, 1902; Cuppl. Fl. Ind. 279, 1976; Fl. 250, 1970.


Eichhornia speciosa Kunth. Enum. 5:61, 1845; Biswas and Calder Handbook of common water and marsh plants of India and Burma, 82, 1953.

A floating hydrophyte (becomes rooted in marshy situations and near the edges of the ponds). Stolons axillary. Leaves radical, dark, shining green, broadly ovate to nearly reniform, erect, margins entire, usually decurved. Spikes 10–30 flowered, on a long peduncle; bracts 2, lower foliaceous, with a tubular sheath, upper tubular, completely enclosed, apiculate. Flowers pale-violet, heterosyloous; perianth lobes 6, unequal. Stamens 6, unequal, curved, exerted, shorter than petals with glabrous filaments and larger with glandular hairy filaments, anthers violet. Styles 3. Stigma fringed.
Generally this plant is classified as floating hydrophyte, but it becomes rooted when the water level falls. I have also seen it surviving, though in a very stunted state, on moist sand.

Flowering & Fruiting: June-December.

Abundant in ponds and ditches.

Athan 361, Diwan Gala Pond.

2. *Monochoria Precal*


*Pontederia vaginata* D. Don Fl. Ind. 80, 1766.


A marshy herb. Root stock short, suberect, spongy. Leaves long petioled, ovate-lanceolate, or ovate-cordate, acute. Flowers bluish in compact axillary racemes, subtended by sheaths. Perianth lobes 6, 2-seriate, outer sepaloid, inner petaloid, bluish-purple with scattered, orange spots. Stamens 6, one stamen with horned filament.

Fruit a capsule. Seeds many, minute, ribbed.

Flowering & Fruiting: September-November.

Commonly found in ponds, ditches and streams.

Athan 21, Shahimpur.
CXL- COMELINACEAE

Key to genera:

Leaves with both the surfaces suffused with purple or the lower only (cultivated).

Lower surface purple.

Plants unbranched; leaves strap shaped, forming a rosette (habit of *Alce*); flowers white .................. 1. *Rhoeo*

Plants extensively branched; leaves alternate, upper green surface with lighter longitudinal streaks;

flowers crimson .......................... 2. *Zebrina*

Both the surfaces blue purple; plants extensively branched; leaves alternate;

flowers pink .......................... 3. *Tradescantia*

Leaves pure green (wild forms).

Flowers subtended by spathaceous bracts .......................... 4. *Commelina*

Flowers not subtended by spathaceous bracts .......................... 5. *Murdannia*

1. *Rhoeo* Hance


*Tradescantia spathacea* Sw. Prodr. 57, 1788.

A perennial herb. Leaves crowded towards the upper half of short, thick, unbranched stem, oblong, lanceolate, deep green above, reddish purple below. Flowers in axillary cymes, enveloped by boat shaped spathe, white. Sepals 3 membranous. Petals 3, ephemeral. Stamens 6, filaments clothed with beaded hairs.

Flowering & Fruiting: August-April.

Commonly planted in pots and rockeries.

2. Zebrina Schnizl.

Zebrina pendula Schnizl. in Bot. Zeit. 7:970, 1849.


Flowering: Nearly throughout the year.

Planted in pots and hanging baskets.

3. Tradescantia Linn.

Tradescantia sp. (fluminensis Vell.;)

Stems decumbent, solid, nodes swollen. Leaves blue-purple on both surfaces, thinly hairy. Flowers terminal, subtended by leafy bracts, rose coloured.

Flowering: Throughout the year.

Very common as pot plant.
4. Commelina Linn.

Key to species:

Spathe subsessile; seeds pitted ................. 1. C. benghalensis
Spathe peduncled; seeds smooth .................. 2. C. hasskarlii


An annual herb with creeping or procumbent branches, rooting at the nodes; nodes swollen. Leaves ovate to broadly ovate-elliptic; leaf sheath ciliate at mouth. Spathe obtriangular, puberulent, often filled with mucilaginous fluid. Flowers blue; cleistogamous flowers solitary. Capsule glabrous. Seeds brownish-black, closely pitted, transversely wrinkled.

Flowering & Fruiting: August-November.

Abundant in moist and shady places.

Ather 142, Jain Farm.


Flowering & Fruiting: September-November.
Rare, occasionally found in marshy places.

Athar 456, Datiyana.

5. **Murdannia** Royle, nom. cons.


**Tradescantia malabarica** Linn. Sp. Pl. ed. 2. 412, 1762.


An annual, tufted, erect, or diffuse herb. Stem simple or branched. Leaves linear-oblong-lanceolate, acute at apex; sheath oblique and ciliate at mouth. Flowers in few flowered cymes, forming terminal panicles, light-pink. Stamens 5-6, 3 perfect with hairy filaments and 2 staminodes. Seeds dark-brown, truncate at one end, rugose, pitted.

Flowering & Fruiting: August–November.

Common among undergrowth in mango orchards.

Athar 125, Vardhman College, Bijnor.
Juncus Linn.


Annual, erect, tufted herbs. Leaves radical, grass-like, base sheathing. Flowers in terminal, biparous or uniparous cymes, secund, bracteate. Perianth segments 6, 2-seriate; outer lanceolate; inner obtuse to acuminate, keeled. Stamens 6 (rarely 3). Carpels 3, connate. Ovary 1-celled; style 1; stigma 3, spirally coiled. Fruit a capsule, enveloped by perianth lobes, sub-priamatic, many seeded.

Flowering & Fruiting: February-April.

Common in the areas near the Ganges.

Athar 298, Madhya Ganga Barrage & Hemrajpur.
CKII. ARACACEAE (PALMAE, nom. alt.)

Key to genera:

Leaves pinnate.

Trunk covered with persistent, woody leaf bases ........................................ 1. Phoenix

Trunk quite smooth ........................................ 2. Reystonsea

Leaves fan shaped; segments drooping ............ 3. Livistona

1. Phoenix Linn.


Stem covered with woody leaf bases. Leaves pinnate, drooping; rachis laterally compressed; leaflets folded along the midrib, spine-tipped. Female spadix shorter than the male. Fruit ovoid, red when ripe.

Flowering & Fruiting: January–June.

Often found in waste places near the villages.

Athan 740, Jhalu.

2. Reystonsea O. F. Cook


396. t. 73, 1920.

A tall palm with globular crown. Stem unarmed, ashy-white with annular scars of fallen leaves. Leaves pinnately lobed, drooping, base elongated, sheathing.
Flowering & Fruiting: Not seen.
Often planted in parks, gardens and avenues.


Flowering & Fruiting: February-May.

A common palm in gardens and parks.

Athar 765, Bijaz Ali Hall, Bijnor.

*Garcetia mitis* Lour.; *Hewes belmoreana* Secc., and *Chrysalocearpus* sp. are grown as curiosity in gardens.
CXLIV—PANDANACEAE

Pandanus Linn.

Pandanus fascicularis Linn. Encycl. 1:372, 1785; BBI. 6:485, 1893;

A large shrub or small tree, usually bent to one side, supported by
many stilt roots. Leaves 3-farous, imbricate, upper half drooping,
crowded at the ends of branches, spinously toothed. Flowers not seen.

Often planted in gardens.
**Typha Linn.**


A tall perennial herb, rhizome long-creeping covered with distichous scales. Stem stout, subterete, Leaves linear, entire, plane-convex, glabrous. **Male flowers** in long condensed terminal spikes; female ones also on the same axis but separated by a 2-6 cm long naked axis. Perianth represented by numerous linear scales. Stamens 2 or 3, intermixed with numerous hairy perianth. **Female flowers** intermixed with numerous bracteoles; ovary seated on hairy stipe. **Stigma linear.**

**Pruit** subtended by white or brown bristles. Ripe spike turns red.

Flowering & Fruiting: July-December.

Abundant in the areas near the Gange.

Athar 476, Near Jalalpur.
CXVI- ARACEAE

Key to genera:

Climbers.

Leaves perforated and segmented ............ 1. Monstera
Leaves entire, blotched with yellow
or yellow-green ............................. 2. Rhaphidophora

Erect plants.

Leaves not spotted with red or white.

Leaves 3-partite; corn erect
depressed-globose, warty ................. 3. Amorphophallus
Leaves entire; tubers horizontal
not warty ................................... 4. Colocasia

Leaves spotted with red or white or
both ........................................... 3. Caladium

1. Monstera Adans.


Hart. Beral. 15, 1853.

A large root climber (assumes erect habit when planted in pots).
Leaves broad, thick, pinnately cut and perforated. Not seen in
flowering.

Often planted in gardens where it is made to climb on the trunks
of other trees, or in pots as indoor plant.

2. Rhaphidophora Hassk.
Rhaphidophora aurea (Lind. & Andrey) Birdeey


Scindapsus aureus (Lind. & Andre) Engler, Pfreich. 37:80, 1908.

A very beautiful root climber, commonly known as, "Money-plant". Stem sulcate between the nodes. Petiole slightly winged. Leaves ovate, acute, cordate, entire, blotted with yellow. Does not flower in this area.

Extensively grown both as outdoor and indoor plant.


*Amun campanulatum* Roxb. Pl. Cor. 3. 68. t. 272, 1820.

A tuberous herb. Tuber depressed-globose, warty. Leaves emerge after the flowering, long petioled, 3-partite; segments multifid. Spathe obliquely campanulate, purple-pale blotched without, lower inner part with several red papillae. Male part of the spadix shorter than the female. Male flowers anthers subsessile. Female flowers carpels 2-3 celled; stigma 2-3 lobed. Fruits orange-red, 2-3 seeded.

Occasionally cultivated.

4. *Calocephasia* Schott
**Colesceasia esculenta** (Linn.) Schott, Beletem. 118, 1832; HFDU. 1977.

**Arum esculentum** Linn. Sp. PL. 965, 1753.

**Arum colesceasia** Linn. Sp. PL. 965, 1753.

**Colesceasia antiquorum** Schott, Beletem. 118, 1832; FDI. 6:523, 1893; FGUS. 2:365, Repr. ed. 1960.

A tuberous herb, the root stock short and horizontal. Leaves with long, purple-blotched petiole, rounded-orbicular, apiculate, with a triangular basal sinus, glabrous. Spathe yellowish, limb yellow, erect, lanceolate, Spadix consisting of three types of flowers, male occupying upper position, female occupying basal portion and the neutral between the two.

**Flowering & Fruiting:** August–December.

Commonly cultivated for the sake of starchy rhizomes.

**Athar 666**, Near Kherki.

5. **Caladium Vent.**

**Caladium bicolor** Vent. Jard. Cela. t. 30.


**Caladium connoertii** Hort. ex Engl. in DC. Monog. Phan. 2:461.

**Caladium argyreopilum** Lem. l.c. 59.

Very attractive pot herbs, propagated by subterranean tuberous stem, leaves on long petioles, blade sagittate-ovate, basal lobes
separated by a narrow sinus, variously mottled (red, white or both) above. No flowering in the area.

Common pet herb, planted both as indoor and outdoor plant.

Flowering & Fruiting: Not seen.
CXVII. LEMNACEAE

Key to Genera:

Fronds with roots.
   Root single .................................. 1. *Lema*
   Roots 2-many .................................. 2. *Spirodela*
Fronds rootless .................................. 3. *Jolphia*

1. *Lema* Linn.


Free floating, minute plants. Root only one; root carp acute. Fronds obliquely ovate-elliptic, rounded at tip, 3-nerved. Flowers and fruits not seen.

Very common in ditches and ponds.

Athar 689, Poul.

2. *Spirodela* Schleid.


A free floating aquatic plant. Roots 2-many (4-9) unequal. Fronds broadly ovate-obovate, orbicular, dark green above, purple-red beneath, 5-15 nerved.

Flowering & Fruiting: Not seen.

Common in ponds and ditches.

Athar 624, Jhalu.

3. Welfia Horkel ex Schied, nom. cons.


Lemna arrhiza Linn. Lant. Pl. 2:294, 1767.

Free floating, aquatic plants. Roots nono. Fronds ovoid, hemispherical, nearly flat above, convex beneath.

Flowering & Fruiting: Not seen.

Often found associated with Azolla.

Athar 672, Barrage Head.
CXVIII. ALISMATACEAE

Segittaria Linn.

Key to species:

Leaves triangular in outline, sagittate at the base; petiole stout keeping the leaves high above the water surface; wing of the seeds entire or suberenate .......... 1. S. sagittifolia

Leaves elliptic in outline, cordate at the base; petiole long slender; leaves floating; wing of the seeds toothed .......... 2. S. guayanensis

sep. Ispula


A stoloniferous, aquatic or marshy herb. Leaves hastate or sagittate; petiole triquetrous. Flowers unisexual; the female ones occupying lower position on the scape and sessile, while the male ones occupy upper position and pedicelled, white in colour, usually 3-4 in a whorl. Stamens 20-24; anthers sagittate. Carpels many free on globose terete. Ashenes obliquely obovate, compressed and winged.

Flowering & Fruiting: January-May.

Abundant on the banks of the Ganges and in nearby areas.

Ather 229, Raddi Ghat.


**Lophocarpus guayanensis** var. leppula (D. Don) Buchen. Pfreich, 16:36, 1903.


Flowering & Fruiting: August-December.

Often found in paddy fields and stagnant water bodies.

Author 579, Near Nareraipur.
POTAMOGETONACLAE

POTAMOGETON Linn.


A hydrophyte with creeping root stock. Stem cylindrical, green or purplish. Leaves dimorphic, submerged leaves, thin, long; floating leaves thicker and shorter, elliptic-lanceolate, oblong, acute to obtuse. Spikes dense, rising above the water surface. Druplets small, oblique, shortly beaked.

Flowering & Fruiting: August-November.

Common in ponds and road side ditches.

Ather 330, Muzaffar Nagar Road.
COK- ZANNICHELLIACEAE

Zannichellia Linn.


Flowering & Fruiting: September-March.

Found in ditches and depressions near the Canals.

Ather 594, Hansawar.
Eriocaulon Linn.


A small erect annual. Stem none. Leaves many, radical, linear. Scapes many bearing a single globular head at the tip. Heads blackish-white. Involucral bracts oblong-ovate, glabrous. Female flowers shortly pedicelled, outer perianth segments 2-3 inner 2, style 3-fid. Male flowers often in the centre of the head.

Flowering & Fruiting: September-November.

Not uncommon, found in sugarcane fields.

Athar 595, Bijnor.
CXII- CYPERACEAE

Key to genera:

Florets bisexual.

Fertile glumes distichous ..................... 1. *Syrurus*

Fertile glumes spirally arranged.

Style base constricted or
artculated above the nut.

Leaves none; bristles present .... 2. *Eleocharis*

Leaves present.

Style flat, hairy; usually
persistent ......................... 3. *Fimbriphyllis*

Style linear, glabrous and
usually deciduous ............... 4. *Bulboscyllis*

Style base neither constricted
nor articulated; bristles filiform
not scale like ....................... 5. *Scirpus*

Florets unisexual; nut enclosed in a
utricule ..................................... 6. *Carex*

1. *Syrurus* Linn.

Key to species:

Spikelets in globose compact heads.

Heads brown-red, 1–2 sessile heads
surrounded by 3–several peduncled
heads ........................................ 1. *C. difformis*

Heads whitish, sessile.
Plant non stoloniferous.
Terminal cluster consists of three distinct heads, cluster some what triangular in outline; bracts 3-4 ................. 2. C. triceps
Terminal cluster uniform, globular; bracts 5-7 ............. 3. C. pygmaeus
Plant stoloniferous ..................... 4. C. brevifellius
Spikelets not in compact heads.
Spikelets digitate; sessile.
Plant with creeping rhizome;
perennial; several stem bases
forming a straight file; spikes
white; glumes 3-5 nerved on
either side of the keel .............. 5. C. niveus
Plant without creeping rhizome;
spikes yellowish brown; glume
with a single nerve close to keel
on either side or nerveless ......... 6. C. sanguinolentus
Spikelets spicate.
Spikes digitate borne on rays
(raya divided or undivided) ............ 7. C. tenuispica
Primary rays not divided (spikelets
arranged in the fashion of leaflets
of a unipinnately compound leaf).
Glume with a conspicuous recurved muco; inflorescence
compact .................................... 8. C. aristatus
Glume without any macro; inflorescence lax .................. 9. C. rotundus

Primary rays divided (at least some spikelets arranged in the fashion of leaflets of a bipinnate compound leaf) spikelets nearly at right angle to the rachis.

Glume with a broad green keel .... 10. C. iria

Glume with a narrow keel ........ 11. C. compactus

Spikelets nearly appressed to the rachis, numerous and forming dense terminal clusters ......................... 12. C. euleusinoides


An erect leafy herb, 25-45 cm high. Leaves shorter than the stem 0.2-0.3 cm broad, glabrous; sheath not fibrous, reddish, mouth oblique, margins of the mouth hayline. Spikes in brown-red globose, compact heads; heads sessile as well as peduncled (on rays), rays up to 2 cm long; bracts leafy 2-3, longest up to 20 cm long. Glumes obovate or broadly ovate, obtuse, shortly mucronate. Stamens 1-2, nut trigonous, obovate.

Flowering & Fruiting: August-December.

Commonly found in paddy fields and sometimes near ponds. Athar 404, Jalalpur.


A tufted non stoloniferous, small herb upto 15 cm high. Leaves shorter or longer than the stem, somewhat falcate, 0.1-0.2 cm broad. Bracts leafy 2-4, the longest upto 7 cm long; terminal head consists of three spikes, the central one being largest. Spikelets white. Stamens 2, nut grey, oblong, spiculate.

Flowering & Fruiting: July-November.

Abundant in grass lands.

Athar 240, Bijnor Inter College, Bijnor Play Ground.


A tufted annual herb with fibrous roots. Leaves shorter than the stem, rarely one or two leaves may exceed; sheath purple tinged, membranous, mouth oblique, usually with a V-shaped cleft on one side. Spikelets in a compact, uniform, globular head; subtended by
5-7 bracts, longest upto 7 (-8) cm long. Glumes nearly 16-18 in a 
spike, shortly mucronate; keel obtuse, 2-3 nerved on either sides 
of the keel. Nut ellipsoid, yellowish-white.

Flowering & Fruiting: July-December.

Common on edges of ponds and ditches.

Ather 334, Hemrajpur.

Kük. Pfreich. 101:600, 1936; Kern. Fl.ales. 1. 7(3):656, 1974; 
HFDD. 554. 1977; Verma and Misra, Ind. Jour. For. 5(3):226-238, 
1982.

*Kyllinga brevifolia* Reutb. Descr. Ic. 13. t. 4, f. 3, 1773; FBI. 

An annual herb with long stolons and deep root. Stolon covered with 
purple coloured long scales with oblique mouth; average length of 
the internode 2.5 cm. Aerial stems 5-25 cm high (only head bearing 
stems taken into consideration). Leaves shorter than the stem, 0.2- 
0.4 cm broad; sheath loose fitting, not fibrous, purple in colour, 
obliquely mouthed. Head uniform, globular or oblong in outline; 
bracts 3-4, unequal, longest upto 8.0 cm long. Spikelets numerous, 
greenish white; glumes acute, keel scabrid in lower part, 3-4 nerved 
on either side of the keel.

Flowering & Fruiting: July-November.

Common along water channels, "Goels" of the tubewells and on the 
edges of paddy fields.

Ather 463, Chitawan.
Cyperus triceps and *C. brevifolius* are sometimes confused with each other. However, following table may be of some help to distinguish between them:

<table>
<thead>
<tr>
<th>S.H.</th>
<th><em>C. triceps</em></th>
<th><em>C. brevifolius</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Non stoloniferous.</td>
<td>Stoloniferous.</td>
</tr>
<tr>
<td>3</td>
<td>Spikes dirty white.</td>
<td>Spikes greenish white.</td>
</tr>
<tr>
<td>4</td>
<td>Keel narrow.</td>
<td>Keel broad, green.</td>
</tr>
<tr>
<td>5</td>
<td>Keel not scabrid in the lower part.</td>
<td>Keel scabrid in the lower part.</td>
</tr>
<tr>
<td>6</td>
<td>Spike composed of three distinct units.</td>
<td>Spike a single unit.</td>
</tr>
</tbody>
</table>


A perennial herb with a woody and creeping rhizome. Roots comparatively tougher than other species of *Cyperus*. Sheath not fibrous. Leaves shorter than the stems. Spikelets 5-15 in a terminal digitate cluster, white. Bracts 2-4, exceeding the spikelets, the longest up to 6 cm long. The anthers undergo torsion after dehiscence and assume a rope like shape. Nut triquetrous, white.

Flowering & Fruiting: March-June.

Rare, occasionally found among the undergrowth in mango orchards and among the vegetation in the flood plains of Ganga.

Athal 283, Jalaipur.


A tufted annual non stoloniferous herb. Roots slender not tough. Leaves shorter than the stem; sheath loose fitted, mouth truncate. Spikelets 10-12 in a cluster, dirty-white, bracts 2-3, longest upto 3 cm long. Glumes acute, nerveless or with one nerve on either side of the glume, close to it. Nut dark-brown.

Flowering & Fruiting: July-December.

Common in paddy fields and along water channels.

Athat 431, Hemrajpur.


*Cyperus flavidus* auct. pl. (non Retz. 1789); FBI. 6:600, 1893; FUGP. 2:382, Repr. ed. 1960.

A small herb without woody base or rhizome, upto 20 cm high. Roots fibrous. Leaves longer or shorter than the stem, 0.1-0.2 cm broad. Spikelets digitate on umbellate rays, occasional rays may be divided. Primary rays upto 3.5 cm (-4.0 cm) long, basal sheath membranous, loose fitting and oblique mouthed. Spikelets 3-7 in a cluster, upto 0.5 cm long, green. Glumes ovate-oblong, obtuse, wings of the glume red tinged in lower part. Nut white, 3-genous, finely reticulate.
Flowering & Fruiting: July-November.

Common in paddy fields.

Ather 414, Muzaffar Nagar Road.


A slender annual herb. Leaves shorter than the stem, 0.1-0.2 cm broad, whole plant not more than 15 cm high. Spikelets arranged in spicate manner, usually one cluster sessile and rest rayed; rays up to 3.0 cm long. Bracts 2-3, up to 6.0 cm long. Glumes boat shaped, wings 5-nerved on either side of the narrow keel, yellow-brown or red-brown, apex with a long recurved awn. Stamen 1. Nut pale-brown.

Flowering & Fruiting: July-November.

Common among the grasses on the edges of ditches and paddy fields.

Ather 115, Jhalu.


A perennial herb. Rhizome woody, clothed with fibrous remains of leaf sheaths. Stem base swollen; 10-70 cm high. Leaves shorter than or equal to the stem, 0.3-0.5 cm broad. Spikelets arranged spicately, 5-10 in a spike. Bracts 3, unequal, up to 45.0 cm long. Spikelets red-brown. Glumes ovate, obtuse, decurrent on the rachilla. Stamine 3. Nut dark-brown.
Flowering & Fruiting: January-December.

Abundant in nearly all types of localities.

Athar 296, Bijner.


A non rhizomatous herb. Leaves nearly equalling the stem; upto 0.4 cm broad; sheath reddish, not fibrous. Have upto 10, very unequal longest upto 15 cm long, branched in upper part. Bracts 4-8, longest upto 40 (-45) cm long. Glumes upto 15 in a spikelet, boat shaped, apex retuse, brown, keel broad and green. Stamen 1. Nut obovoid, brown, smooth.

Flowering & Fruiting: July-November.

Common in rice fields, along drains and edges of ditches.

Athar 114, Hamrajpur.


*Cyperus dilutus* Vahl, Enum. Pl. 2:357, 1806.

Erect perennial herb. Stem longitudinally striated. Leaves usually equal to the stem, margins and keel more or less scabrid, upto 0.5 cm broad. Spikelets on branched rays; primary rays upto 10.

Glumes 3-12 in a spikelet; lowest two glumes small; reddish, acute, 2-3 nerved on either side of the narrow green keel. Nut dirty white, trigonous, acutely beaked.

Flowering & Fruiting: July-November.

Common along water channels.

Ather 467, Vidur Kuti.


A large perennial herb, upto 100 cm tall. Leaves equal to or longer than the stem, 0.5-0.6 cm broad. Inflorescence a compound umbel with numerous pale-golden spikelets crowded towards the ends of the rays. Rays upto 15 and longest upto 22 (25) cm long. Bracts 3-7, scabrid on the margins. Nut trigonous, dark-brown.

Flowering & Fruiting: July-November.

Common in paddy fields.

Ather 345, Near Khari.

2. Eleocharis H. Br. (= Haleocharis Lestib.)

A tufted stoloniferous herb; roots fibrous, black when dry. Leaves none. Sheaths red tinged, loose fitting, membranous, striated, mouth usually truncate, the sheaths are distinctly red punctate, near the mouth the punctae are more dense to form a narrow band encircling the mouth; maximum breadth of the stem 0.2 cm. Spikelets upto 0.4 cm broad and 1.0 cm long, ovate-acute; lowest two glumes very large, broadly keeled and look as the continuation of the stem. Fertile glumes smaller, obtuse, brown tinged; keel narrow, green; margins hyaline. Bristles 4-6, retrorsely scabrid. Nut biconvex, pale, tipped by the broadly conical style base.

Flowering & Fruiting: September-February.

Found in marshy places.

Ather 210, Jalalpur.


Key to species:

Spikelets single, terminal.

Bracts none; nut biconvex, reticulate ........................................ 1. *F. schoenoides*

Bracts present (usually 2), nut trigonous, tubercled ....................... 2. *F. ovata*

Spikelets numerous; in branched, umbellate cymes.

Bracts (not bracteoles) reaching nearly to the top of the inflorescence or exceeding it.
Spikelets over 0.5 cm long;
bracts leafy; nut obovoid,
white or light straw coloured,
with transverse markings ................ 3. *F. dichotoma*
Spikelets not more than 0.5 cm.
Style 2-fid; nut with
transverse markings ..................... 4. *F. bisemibellata*
Style 3-fid; nut tubercled .......... 5. *F. quinquangularis*

Bracts reaching hardly upto the
middle of inflorescence.

Spikelets globose ...................... 6. *F. miliacea*
Spikelets linear-lanceolate ........... 7. *F. tenera*

1. *Fimbristylis schoenoides* (Retz.) Vahl, Enum. Pl. 2:236, 1806;


A tufted non rhizomatous herb, upto 25 (-30) cm high. Leaves fili-
form, shorter than the stem, upto 0.1 cm broad. Spikelets solitary
(occasionally paired) terminal, upto 1.2 cm long, ovate, acute;
bracts none. Glumes broadly ovate-rounded; shortly mucronate, upto
0.4 cm long and 0.3 cm broad; margins hyaline. Rachilla chaffy,
after the fall of glumes. Nut biconvex, obovate, stipitate and
reticulate.

**Flowering & Fruiting:** August-November.

Common along the edges of water bodies and paddy fields.
Ather 420, Muzaffar Nagar Road.


*Fimbristylium monostachya* (Linn.) Hassk Pl. Jav. Rar. 61, 1846.

*Cyperus monostachyes* Linn. Lant. 180, 1768.

A non stoloniferous, tufted herb. Leaves filiform slightly scabrid towards the apex. Spikelets upto 2 cm long; lowest two glumes often different, long mucronate; remaining glumes acute, shortly mucronate. Nut trigonous, tubercled, iacchilla chaffy after the fall of glumes and nuts; the scales broader than those of *F. schoenoides*.

Flowering & Fruiting: August–November.

Often grows in association with *F. schoenoides*.

Athar 111, Muzaffar Nagar Road.


*Scirpus dichotomus* Linn. Sp. Fl. 1:50, 1753.


An erect, tufted annual. Leaves shorter than the stem; some of them falcate, margins scabrid in upper part; thickened, upto 0.3 cm broad. Flowering stem upto 45,0 cm high, with spikelets in terminal umbel.
Primary bracts 3–5, not very long but at least one of them always exceeding the inflorescence. Rays 5–8 (in my specimens). Spikelets upto 1.5 cm long, ovate, acute; there is a red ring at the junction of spikelet and the peduncle. Glumes ovate rounded, obtuse, shortly, mucronate, chestnut brown; margins hyaline; base obliquely truncate. Nut obvoid, straw-coloured; minutely tubercled, tubercles arranged in longitudinal rows.

Flowering & fruiting: July–November.

Common in grassy localities near water bodies and paddy fields.

Athar 462, Hemrajpur.


A small tufted; non rhizomatous annual, upto 25.0 cm high. Leaves linear, falcate (particularly in dwarf specimens), upto 0.2 cm broad; margins of the leaf sheath membranous, golden-brown, red punctate (the character has been found to be more prominent in dwarf specimens, though, quite evident in tall ones as well). Flowering stems upto 20. Primary bracts unequal, at least one overtopping the inflorescence or nearly equalling. Spikelets ovoid-ellipsoidal, acute upto 0.5 cm long. Glumes ovate, mucronate, glabrous, keeled; keel green. Nut resembles that of *F. dichotoma* but smaller in size.
Flowering & Fruiting: July-December.

Commonly found in cultivated fields and on dry bed of the Ganges.

Ather 260, Mandawar.


*Scirpus quinquangularis* Vahl, Enum. Pl. 2:279, 1806.


An annual tufted herb, upto 60.0 cm high. *Leaves* linear, upto 2.5 cm broad, shorter than or equal to the stem. *Flowering stem* 1-many (upto 20 in my specimens). *Bracts* usually filiform, shorter than the inflorescence; scabrid. *Rays* di-trichotomously divided; there being a sessile spikelet at the point of division. *Spikelets* brown-red; glumes acute, keeled. *Nut* obtusely trigonous, tubercled, minutely red blotched.

Flowering & Fruiting: July-December.

Common in paddy fields.

Ather 383, Dheram Negri.


*Scirpus miliiaca* Linn. Syst. Nat. ed. 10. 866, 1759 (excl. determinations 'miliiaca').

This taxon much resembles with *F. quinquangularis* but can be distinguished with the help of following table.

<table>
<thead>
<tr>
<th>S.N.</th>
<th><em>F. miliacea</em></th>
<th><em>F. quinquangularis</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Leaves usually longer than the stem.</td>
<td>Leaves shorter than or equal to the stem.</td>
</tr>
<tr>
<td>2</td>
<td>Leaves without a distinct midrib.</td>
<td>Leaves with a keel like midrib.</td>
</tr>
<tr>
<td>3</td>
<td>Leaves with 3-12 parallel nerves.</td>
<td>Nerves obscure, except the midrib.</td>
</tr>
<tr>
<td>4</td>
<td>Spikelet globose.</td>
<td>Spikelet lanceolate.</td>
</tr>
<tr>
<td>5</td>
<td>Nut white with raised, prominent tubercles.</td>
<td>Nut dirty or red-white, tubercles depressed.</td>
</tr>
</tbody>
</table>


A non rhizomatous, tufted herb. Leaves linear, shorter than the stem, falcate, with one or two prominent nerves. Sheath red punctate. **Flowering stems 5-15** (sometimes even less than 5). **Primary bracts** filiform, shorter than the inflorescence. **Primary rays** divided only once or twice. **Spikelets** brown-red, linear lanceolate; rachilla ragged with scales. Nut obtusely trigonous, tubercled.

**Flowering & Fruiting:** July-November.
Occasionally found in paddy fields.

Athar 399, Tajpur.

4. **Bulboestylis Kunth, nom. cons.**


**Scirpus barbatus** Rotth. Progr. 27, 1972.

A non rhizomatous, tufted annual herb with fibrous roots. Stem striate. Leaves filiform; margins thickened; midrib prominent; sheath with ciliate mouth. Spikelets 3-15 in terminal or pseudo-lateral digitate clusters, sessile, light-brown in colour. Glumes boat shaped, keeled, nerveless; wings puberulous. Nut trigonous, whitish, minutely tubercled; apex with a knob.

Flowering & Fruiting: July-November.

Common in sandy soil.

Athar 398, Najibabad Road.

5. **Scirpus Linn.**

Key to species:

Plant leafless.

Stem sharply triquetrous; each face
0.3-0.3 cm broad; spikelets in
clusters of 3-6, clusters sessile .......... 1. *S. mucronatus*
Stem not sharply triquetrous, each face
0.1-0.2 cm broad; spikelets in clusters
of 4-10, some clusters on short rays ...... 2. *S. lateriflorus*
Plant leafy.

Spikelets cottony; plant scabrid ........... *S. comosus*

Spikelets not cottony; plant smooth ...... *S. maritimus*


A perennial, tufted herb. Rhizome short. Root fibrous. Stem sharply
triangular, striate, green. Leaves none. Sheaths obliquely mouthed,
brownish when dry, microscopically red; punctate between the nerves.
Spikelets 3-6 in sessile clusters close to the apex. Glumes ovate,
many nerved, mucronate. Stamina 3, anthers yellow, apiculate, longer
than the filament. After the fruit setting the filaments elongate
and become flattened, single nerved and brown, almost equalling the

Flowering & Fruiting: July-November.

Common in marshy localities.

Athan 263, Hemrajpur.

2. *Scirpus lateriflorus* Gmelin, Syst. Nat. 2, 1:127, 1791; Kern,

*Scirpus supinus* Linn. var. lateriflorus (Gmel.) Koyama, Journ. Fac.

*Scirpus supinus* acut. pl. non Linn. 1753; FUG. 2:410, Repr. ed.
   1960.

*Babu (1977) has treated this taxon as a variety of *S. supinus* Linn.*

Flowering & Fruiting: July–November.

Common in paddy fields.

Athal 410, Fuzafar Nagar Road.


A perennial, tufted herb. Root stock thick, stems striated or rather grooved. Leaves nearly equalling the stems, scabrid on margins. Spikelets ellipsoid, narrow, cottony, in terminal compound umbel. Glumes acute, boat shaped, with a single nerve. Nut fusiform, light brownish; supported by many basal hairs which impart cottony appearance to the spikelet, longer than the nut.

Flowering & Fruiting: July–December.

Here, occasionally found on the walls of very old buildings.

Athal 321, Mandawar.

A tall, stelechiferous, marshy herb. Stolons covered with fibrous sheaths; stem base nodose. All the lower parts usually black when dry. Leaves longer than or equaling the stem, upto 0.7 cm broad. Midrib keeled abaxially and lateral nerves prominent adaxially. Spikelets in terminal umbellate clusters. Rays upto seven in a single inflorescence, divided or undivided, each ray bears 1-3 spikelets; rays upto 5.0 cm long and spikelets upto 2.0 cm; brown-red in colour, oblong-lanceolate, acute. Glumes shallowly concave, ovate, bifid at the apex, keels extending beyond the apex as short macro. Stamens 3, anthers longer than the filaments. Bristles 3-6, retrorsely scabrid. Nut not seen.

Flowering & Fruiting: October-February.

Common in paddy fields.

Athar 422, Mohammadpur.


An erect rhizomatous, marshy herb, upto 75.0 cm high. Leaves basal, equal to the stem, upto 0.3 cm broad; margins smooth; midrib keeled abaxially; sheath breaking up into fibres, fibres appearing like
feathers. Spikelets racemose, each spikelet borne on a short peduncle in the axil of a bract. Female spikelets 2-5 towards the base while male ones 3-6 towards the apex. Lowermost bract the longest, up to 45.0 cm long, bracts subtending male spikelets shorter than the corresponding spikelet. Achenes elliptic elongate, 3-gonous, enclosed in pubescent perigynium.

Flowering & Fruiting: January-April.

Often found in road-side ditches and on the banks of rivers and canals.

Ather 297, Muzaffar Nagar Road.
Grasses, perhaps the most embarrassing group of plants from identification point of view, pose further problems when a single key is provided consisting of all the tribes and subtribes. Therefore, I have adopted the traditional method of assigning a specimen first to a group, then to a tribe and finally to genus and species. This renders the keys less confusing and easy to follow. The keys to groups, tribes and to genera of tribe Paniceae are after Bör (1960).

Key to groups:

Spikelets 2-flowered, falling entire at maturity, usually with the upper floret hermaphrodite and the lower male or barren and if the latter, often reduced to lemma or rarely the lemma entirely absent, all alike or more often varying in size, shape and structure, frequently dorsally compressed ........................ Panicoideae

Spikelets one to many flowered, breaking up above the more or less persistent glumes, or if falling entire then not 2-flowered with the lower floret male or barren and the upper hermaphrodite, usually more or less laterally compressed or terete or if 2-flowered and falling entire, the glumes and lemmas all membranous and with a globose wrinkled seed which splits the palea when mature ............... Pooidae
Key to the tribes of Panicoideae:

Male and female spikelets in separate inflorescences or in different parts of the same inflorescence and of different appearance; lemmas hyaline or membranous and thinner than the glume ........................................... 1. Leydeae

Spikelets all hemaphrodite, or with male or barren and hemaphrodite spikelets mixed in the same inflorescence and so arranged that a male or barren spikelet is near a hemaphrodite spikelet, or if unisexual then the lemma of the fertile floret indurated.

Spikelets often paired, with one sessile and the other pedicelled, those of each pair similar or more often dissimilar, rarely solitary and all alike, glumes as long as the spikelet and enclosing the florets, more or less rigid and firmer than the lemmas which are both hyaline or membranous, upper lemma usually awned ........................................... 2. Andropogoneae

Spikelets solitary or paired, more or less similar; glumes usually membranous, the lower usually smaller or sometimes suppressed; lower lemma mostly resembling the upper glume in texture; upper lemma papery to very tough and rigid, usually awnless ........................................... 3. Paniceae
Key to the tribes of Poaceae:

Spikelets borne in open or contracted spike-like panicles, less often in raceme or spikes.

Fertile florets 2 or more in a spikelet,
if one then sterile florets above it.
Lemma and rachilla glabrous or hairy,
but the hairs never envelop the
lemma, or if so then the lemma with
a geniculateawn.

Glumes shorter than the lowest
floret and the upper floret
distinctly exerted.

Lemmas 3-many nerved, awn-
less, or ifawned theawn
simple; stigmas 2; ovary
glabrous at the apex, or
if hairy at least without
a hairy appendage; lemmas
dull, membranous to cori-
aceous, exerted from the
glumes, glumes 2 or 1 ........... 4. Festucaceae
Lemmas 1-3 nerved; inflor-
escence of panicles or
racemes.

Inflorescencea panicle
or if raceme or spike
then the spikelets not
second .................... 5. Bresuntesce
Inflorescence a raceme or panicle, spikelets preceded 6. Chlorideae
Glumes longer than or equal to the lowest floret, often as long as the spikelet and enclosing the spikelet; lemma awnless or awned from the back; awn usually knobbed; ligules membranous 7. Avenaceae
Lemma and rachilla joints bearing long silky hairs which envelop the lemma, tall grasses 8. Arundinaceae
Fertile floret one in a spikelet with or without, often much reduced, one or two male or barren florets below it.
Glumes minute (usually represented by two semicircular inconspicuous lips); fertile lemma and palea very similar in shape and texture 9. Cynoseae
Glumes well developed; fertile lemma and palea not similar.
Spikelets with 3-florets, lower florets well developed, never transversely rugose or flanged 10. Phalaridaceae
(37. Phalaris)
Spikelets with one fleret; rachilla disarticulating above the more or less persistent glumes; leaf blade linear, sessile.

Spikelets very rarely falling entire and then with firmly membranous to coriaceous,awned or 5-nerved lemmas; lemma hyaline or membranous.

Lemma 3-5 nerved, frequently awned; glume longer and firmer than the hyaline lemma ................. 11. Agrostideae
Lemma 1-3 nerved, awnless; glumes and lemmas very similar in texture .......... 12. Sporoboleae

(Sporobolus)

Spikelets falling entire at maturity, spikelets solitary; glumes awned; awns bluish .... 13. Pooideae

(Poaceae)

Spikelets sessile on opposite sides of the rachis of solitary spike or spike like raceme; ovary hairy; grain longitudinally furrowed, lodicules hairy; lemmas 3-5 or many nerved .................................................. 14. Triticeae
1. Tribe - Maydeae

Key to genera:

Male and female spikelets in the same inflorescence; female spikelet single, enclosed in a very hard globose involucre ............... 1. Coix

Male and female spikelets in separate inflorescence; male inflorescence terminal, female in lower axils; female spikelets numerous on a thick axis, covered by spathes ............... 2. Zea

2. Tribe - Andropogoneae

Key to genera:

Plant more than 1.0 m tall.

Inflorescence, when mature, silky or cottony.

Spikelets awned ........................................ 3. Erianthus

Spikelets awnless ....................................... 4. Saccharum

Inflorescence not cottony or silky.

Panicle leafy.

Inflorescral spikelets covered with tubercled-based bristles;

Sessile spikelets awned; own nearly 4-5 cm long ............... 5. Themeda

Inflorescral spikelets glabrous;

Sessile spikelets awnless or very shortly awned ............... 6. Apluda

Panicle not leafy.
Panicle contracted; lower
glumes tubercled ..................... 7. *Vetiveria*
Panicle open; lower glumes not

tubercled ............................. 8. *Sorghum*

Plants not more than 50–60 cm tall.

Nodes with a ring of hairs.

Inflorescence cylindric; cottony
when mature ............................. 9. *Imperata*

Inflorescence consisting of sub-
digitately arranged racemes, not
cottony ................................. 10. *Dichanthium*

Nodes without any ring of hairs.

Vegetative parts glabrous, or if
hairy then the hairs not tubercled

Plant ascending, rooting at the
lower nodes; inflorescence
reddish; spikelets shortly pedi-
celled ................................. 11. *Chrysopegon*

Plants erect, not rooting at lower
nodes; spikelets sessile or long
pedicelled.

Spikelets long pedicelled .... 12. *Capillipedium*

Spikelets sessile.

Lower glume with trans-
verse ridges; spike
symmetrical; awns spreading

..................................... 13. *Jechenium*
Lower glume without
ridges; spikelets second;
some twisted around each
other like a rope ........ 14. Heteropogon

Vegetative parts with tubercle
based hairs; spikes several in
a group and axillary, giving a
beaded appearance ..................... 15. Hackelochlea

3. Tribe - Panicaceae

Key to genera:

Spikelets arranged in more or less open panicles, or with the panicles contracted and
spike like.

Spikelets not subtended by bristle like
branches; upper glumes as long as the
spikelets .................................. 16. Panicum

Spikelets subtended by bristle like
branches which remain after the spike-
lets have fallen; upper lemmas often
transversely rugose ..................... 17. Setaria

Spikelets arranged in 1-sided spikes or
spike like racemes; spikes or racemes
digitate or scattered, rarely solitary.

Leaves of upper flowes more or less
crumose or cariaceous usually with
narrow inrolled margins exposing much
of the palea.
Lower glume and the lowest internode of the rachilla not forming a swollen callus at the base of spikelet.

Lower glume, when present, turned away from the rachis of the racemes or spikes; the back of the upper lemma facing it i.e., spikelet abaxial.

Lower glume usually absent; spikelets plane-convex ........ 16. Paspalum

Lower glume present.

Glumes acuminate or awned, rarely only acute; upper lemma not mucronate.
Leaf blades linear; racemes dense; culms erect or suberect .... 19. Echinochloa

Leaf blades, lanceolate to ovate; racemes loose to moderately dense; culms creeping and ascending ........... 20. Oplismenus

Glumes awnless, if acuminate then with upper lemma mucronate.
Upper lemma acute not mucronate ............... 21. Paspalidium
Upper lemma obtuse, mucronate or very shortly awned ……… 22. Uroclysm
Lower glume turned towards the rachis; the back of the upper lemma turned away from it i.e.
spikelets adaxial ………. 23. Brachiaria
Lower glume and lowest internode of rachilla forming a swollen callus at the base of the spikelet; upper lemma mucronate or short awned ………... 24. Eriochloe
Lemma of the upper floret thinly cartilagenous, usually with flat hyaline margins ………… 25. Digitaria

4. Tribe - Festuceae

Key to genera:

Spikelets awnless, in panicles …………………… 26. Poe
Spikelets awned in simple racemes ……………… 27. Lolium

5. Tribe - Eragrostis

Key to genera:

Spikelets pedicelled, in panicles; lemma 3-nerved ………………………………………………………… 28. Eragrostis
Spikelets sessile, in second spikes.
   Spikes arranged digitately or sub-digitately, spiculate …………………… 29. Pastistioctenium
Spikes arranged pinnately, acute ............ 30. Desmostachya

6. Tribe - Chlorideae

Key to genera:

Spikelets armed ........................................ 31. Chloris
Spikelets unarmed ........................................ 32. Cynodon

9. Tribe - Cymbidae

Key to genera:

Leaves broad, sheath inflated ...................... 35. Cymbopogon
Leaves narrow, sheath not inflated .............. 36. Cryza

11. Tribe - Agrostideae

Key to genera:

Panicle slender, compact; glumes unarmed ...... 39. Alopecurus
Panicle broad, loose; glumes armed ............. 39. Polypogon

14. Tribe - Triticaceae

Key to genera:

Spikelets normally solitary at each node,
more than 2-flowered; glumes more than
1-nerved, glumes and lemmas keeled at the
back ............................................................. 42. Triticum
Spikelets more than one at each node;
spikelets 1-flowered ................................. 43. Hordeum
1. *Ceix* Linn.

*Ceix* *lacrasta-jobi* Linn. Sp. Pl. 972, 1753; FBl. 7:100, 1896; Reizada et al. Ind. For. Rec. (ii. 3.) Bot. 4:175, 1957; CECIP. 254, 1960; IFAD. 593, 1977.

Often found in marshy places.

Athar 397, Jalalpur.

2. *Zea* Linn.

*Zea* *mays* Linn. Sp. Pl. 971, 1753; FBl. 7:102, 1896; Reizada et al. Ind. For. Rec. (ii. 3.) Bot. 4:175, 1957; CECIP. 270, 1960; IFAD. 654, 1977.

Cultivated as grain and forage crop. Locally called as "Maika".


*Andropogon* *ravenna* Linn. Sp. Pl. ed. 2:1481, 1763.

*Erianthus elephantinus* Hook. f. FBl. 7:122, 1896.

Commonly found along railway tracks, edges of cultivated fields and near abandoned brick klin.

Athar 401, Jhalu.

*Bor (1960) recognised four varieties subordinate to this species. The specimens collected from Bijnor are referable to typical variety because of their ovoid, hard and polished involucre.
4. Saccharum Linn.

Key to species:

Stem not more than 1.0 cm in diameter, without sugary juice.

Sheath glabrous ............................................. 1. S. spontaneum

Sheath silky hairy ........................................... 2. S. bengalense

Stem upto 2.0 (-2.5) cm in diameter, filled with sugary juice ........................................... 3. S. officinarum


Very common on the dry beds of the Ganges and in adjoining areas.

Ather 466, Rawli.


Saccharum arundinaceum How. f. Fbl. 7:119, 1896, pro parte (non Retz. 1789).


Common on dry river beds and on the edges of cultivated fields.

Locally called as "Moonj" and the fibres extracted from the leaves are used to make ropes.

Ather 400, Near Khari.

This species locally called as “Janna” or “Ikh” constitutes the most important cash crop of the area.


Occasionally found in fallow lands.

Ather 508, Jalalpur.


*Apluda mutica* Linn. Sp. Pl. 82, 1753; GGCBP. 93, 1960.

*Apluda varia* suct. FBI. 7:150, 1896.

Found, occasionally, near the villages.

Ather 297, Jalalpur.


Often found near villages on field edges. Locally called as "Khas", Athar 464, Naga Ka Tajpur.

9. Sorghum "Leench"

Key to species:

Leaves linear, narrow; panicle open ............. 1. S. halopense
Leaves broad; panicle close and dense ............ 2. S. vulgare


Haleus sorghum Linn. Sp. Pl. 1047, 1753.

Cultivated as grain and forage crop. Locally called as "Jewar" or "CHIAR".
Imperata cylindrica (Linn.) P. Beauv.

Note Characteristic white, cottony and cylindric panicles.
Athar 396, Bijnor.

9. *Imperata* Cyr.


Very common in lawns during winter.

Athar 389, Bijnor.


Abundant in lawns, waste places, on road sides and often on wells.

Athar 261, Bijnor.


*Chrysopogon aciculatus* (Retz.) Trin. *Fund. Agrost.* 188, 1820;

Not uncommon. Found in fallow lands.

Athal 440, Jalalpur.

12. **Capillipedium** Stapf


**Andropogon assimilis** Steud. in Zoll. Syst. Verz. 88, 1854; Syn.

1:397, 1854; FBI. 7:1791, pro parte.

Sometimes found among dense vegetation.

Athal 446, Tajpur.

13. **Ischaemum** Linn.


Very common in damp places, particularly on the edges of road side ditches.

Athal 379, Muzaffar Nagar Road.

14. **Heteropogon** Pers.

*Heteropogon contortus* (Linn.) P. Beauv. ex Reem. & Schult. Syst.


Found in damp and shady places.

Athal 419, Mandawar.

15. **Hackelochloë** O. Kuntze, nom. cons. prop.


**Cenchrus granularis** Linn. Mant. Pl. 2:575, 1771.


Occasionally found in damp places.

Athal 584, Near Mandawar.

16. **Paniceum** Linn.

Key to species:

Leaves with cilia on surface as well as margins ........................................ 1. *P. tryphonum*

Leaves without any cilia ........................................ 2. *P. paludosum*


Commonly found in grassy localities and cultivated fields.

Athal 377, Bijnor.

*Panicum proliferum* auct. pl. (non Linn. 1797); FBI. 7:50, 1896.

Common on the edges of ditches and on marshy land.

Athan 320, Hemrajpur.


Key to species:

Involucral bristles retrorsely barbed ........... 1. *S. verticillata*

Involucral bristles antroserly barbed ........... 2. *S. glauca*


*Panicum verticillatum* Linn. Sp. Pl. ed. 2. 82, 1762.

Very common in shady and damp places.

Athan 376, Aijnor.


Commonly found in sandy places.

Athan 369, Bagawala.

18. *Paspalum* Linn.

Key to species:

Spikelets nearly orbicular, whitish; rachis with prominent mid-rib and faint lateral nerves; whole plant turns brown when dry ...... 1. *P. setaceum*
Spikelets acute, lanceolate; rachis with mid-rib and lateral nerves nearly similar; the plant remains green when dry .................. 2. P. distichum


Atha 359, near A.J.P. Inter College.


Found associated with P. scrobiculatum.

Atha 359, Wijner.


Found on the edges of cultivated fields and ditches.

Atha 357, Near Rawli.


Key to species:

Leaves smaller; ligule hairs not exerted;
spikes dense; rachis hairy ...................... 1. O. bursarum

Leaves larger; ligule hairs exerted;
spike lax; rachis glabrous .................... 2. O. compositus


Grows in shady places.

Ather 444, Bijnor.


Very common in mango orchards where it forms a thick vegetation.

Ather 435, Mandawar.

21. Paspalidium Stapf


Common on road sides, fields and in waste land.

Ather 351, Ganj.


*Panicum javanicum* Hook. f. FAL. 7:35, 1896, pro parte.

Often found in sandy soil.
Ather 427, Jhalra.

23. Brachiaria C. Griseb.


*Panicum ramosum* Linn. Cont. Fl. 1:29, 1767; Fl. 7:36, 1896; pro parte.

Common on road sides, cultivated fields and lawns etc.

Ather, 429, Bijnor.

24. Eriochloa Kunth

Key to species:

1. Spikelets acute, appressed thinly hairy, often with reddish tinge

2. Spikelets shortly awned, hairs spreading, not with reddish tinge


Very common in damp places.

Ather 417, Bijnor.


Found in agricultural fields and other moist localities.
Athar 411, Bijnor.

23. *Digitaria* Heist. ex Fabricius


Not common, found in the areas near the Ganges.

Athar 406, Bari.


Abundant in lawns, on the edges of fields and other damp places.

Athar 336, Bijnor.

27. *Lolium* Linn.


Often found in lawns.

Athar 421, Bijnor.


Key to species:

Pedicels of the spikelets less than 2.0 mm long.

- Nodes of the central axis with long hairs; spikelets white with pinkish tinge, upto 7-flowered

1. *E. coeretata*
Nodes of the central axis without long hairs; spikelets reddish not more than 5-flowered .......................... 2. *E. japonica*

Pedicels of the spikelets 2.0 mm or more long.

Spikelets lanceolate (broadest in the middle).

Pedicel in most of the cases shorter than or equal to the spikelet.

Pedicel with a gland above the middle .......................... 3. *E. paucicostata*

Pedicel without a gland above the middle .......................... 4. *E. atrovirens*

Pedicel in most of the cases longer than the spikelet, nodes without hairs or rarely with 1-2 bristles ............. 5. *E. gangetica*

Spikelets ovate (broadest at the base) tinged with red .......................... 6. *E. unicolorata*


Occasionally found on dried bed of Ganga and in adjoining areas. Athar 330, Rawli Ghat.


Eragrostis interrumpia var. tenuissima Stapf ex Hook. f. FBI. 7:316, 1896.

In dry paddy fields, road side ditches and other marshy localities.

Athar 326, Jalalpur.


Pea eragrostis Linn. Sp. Fl. 63, 1733.

Eragrostis minor Host Cram. Austr. 4:15, 1809, nom. inval.; FBI.

7:321, 1896.

Common in the flood plains of Ganga and other sandy localities.

Athar 423, Jalalpur.


Often found near water bodies and marshy places.

Athar 405, Jalalpur.


3:4, 39, 1851, pro parte; FBI. 7:318, 1896, pro parte.
Common in sandy soil.

Athar 595, Bijner.


*Poa unioloides* Netz. *Observ.* Bot. 5:19, 1769.


Found in cultivated fields.

Athar 100, Near Jalalpur.


*Cynosurus aegyptius* Linn. *Sp.* Pl. 72, 1753.


A common grass of grasslands and lawns.

Athar 401, Bijner.


Bragg—tyn—yyoid^g (H«ts«) P. a«aiiv» £••« ^rost* 162» l@13| rex. 7t324» ISM,
[73x629]Athar 99| GanJ«
[510x568]406.
[75x542]19601 ri-yy. 993» IfHl Ii*« 2?3, 19?0.
[72x508]M6Aica ilicjitata l^osb* Fl« Zii<^ @d* Csssy & JaU* f i328» ie20»
[72x473]2P» ^t tS20.
[73x420]Atliar 2&t» Clijnor*
[73x389]^* “^^^
[73x389].iieh* in
[73x389]Pm:&m§ n&j»
[73x356]Cynodon dactylon (t4nn*) Pexa, ^yn* ^« e&« ISOdf s-ai« *7t2^« 1f$6|
[73x331]GBCXP. 469 19601
[73x331]Wm*
[73x331]998» 1977t ri^^'« S75« 1978.

Eragrostis cyneovertoides (Hetz.) P. Beauv. Ess. Agrost. 162, 1812;
FBl. 7:324, 1896.
Not uncommon, found in wastelands, prefers sandy soil.

Athar 99, Ganj.

31. Chloris Sw.

Chloris delichostachya Lagasca, Gen. Sp. Pl. 5, 1816; GBCIF. 466,

Chloris incompleta Roth, Nov. Fl. Sp. 60, 1820.
Common in agricultural fields.

Athar 251, Bijnor.


Cynodon dactylon (Linn.) Pers. Syn. Pl. 85, 1805; FBl. 7:298, 1896;

Paniceum dactylon Linn. Sp. Pl. 58, 1753.

Very common in the area.

Athar 428, Bijnor.

33. Avena Linn.

Key to species:

All the lemmas with a thickened callus
and densely bearded with golden hairs
at the base .................................................. 1. A. fatua
Only the lowest lemmas with a thickened callus, lemmas glabrous except a few hairs at the base. 2. A. sativa x sterilis


Often found in sandy soil.

Athar 586, Landewar.


Cultivated as food grain crop.

34. *Arundo* Linn.


Found along water courses.

Athar 552, Bijnor.

35. *Hygrocybe* Nees


*Leersia aristata* (Metz.) comb. Pl. Ind. ed. 2. 2:207, 1832.

*Zizania aristata* (Metz.) Kunth Rev. Gram. 1:8, 1829.


Naro, found floating in ditches and ponds.

Athen 349, Near Khari.

36. Cryza Linn.


Extensively cultivated in the area.

37. Thalaris Linn.


Commonly found in wheat fields and on road sides.

Athen 346, Bijnor.

38. Alopecurus Linn.


Found in marshy places.

Athen 302, Hemrajpur.


Alopecurus arensi Linn. Sp. Pl. 61, 1753.

Common in damp localities.

Ather 591, Vidurkuti Road.

40. Sporobolus R.Br.


Agrostis diandra Betz. Observ. Doct. 3:19, 1789.

Found on saline soil and river beds.

Ather 509, Hanrajpur.

41. Pterotis Ait.


Anthoxanthera indica Linn. Sp. Pl. 28, 1753.

A very beautiful grass of sandy soil.

Ather 670, Near Jalalpur.

42. Triticum Linn.


Triticum sativum Lamk. Fl. Frac. 3:625, 1778.


Extensively cultivated in the area.
43. *Hordeum* Linn.


*Cultivated as grain crop.*