**Phenology of plant species of Subtropical hills of Darazinda, Takht-e Suleman Range F.R D.I. Khan, Pakistan**

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**Abstract:** The major bulk of the flora showed that total 189 species (88.7%) were in vegetative phase. March with 59 (27.6%) followed by April 42 (19.7%) species. Flowering Seasons extended from February to August and 22 plants flowered in October and December. Spores are produce by *Equisetum arvense*. The month of March had the high flowering season, 51 species (24%) were blossomed. Fruiting species showed that from April to June 70 species (32.8%) fruiting stage, while 49 species (23%) were from August to October and fruits produced in various months of the year were 47 species (22%). June month with high fruiting plants species with 36 (17%) followed by April with 34 (16%) species.

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**Key words:** Phenology, Fruit phase, Vegetative phase, Flowering phase

**Introduction:**

The seasonal occurrence of developmental such as bud break, autumn leaf drop or life cycle events, such as flowering is called Phenology (Kafak *et al*., 2009). Climate change effect the length of growing period (Singh & Kushwaha, 2005). Similar studies were carried out by Malik *et al*., (2007) who stated that July and August were high flowering months. Golluscio *et al*., (2005) stated that phonological activity of grasses were higher in autumn and winter. Yadav and Yadav*et al*., (2008) observed during September woody species in majority have fruiting. Jadeja & Nakar (2010) reported that 50% species produce fruits in the month of December. Nath *et al.,* (2008) stated that climatic and biotic factors were important factors in plant phenologies.

**Materials and Methods:**

Darazinda is a small Frontier Region of Khyber Pakhtunkhwa, Pakistan. The area is also known as Largha Shirani. This area is located between North latitude 31-30° and 31-34° and West longitudes 69.55° and 70.24°. Total area of this region is 3,229 square kilometers. On the North it is bounded by South Waziristan Agency, on the east by Kulachi, on the South by Musa Khel and Dera Ghazi khan (Punjab) and on West by Zhob (Baluchistan). In this tribal area, there are no urban localities.

**Results and Discussion:**

**Flowering phase:**

Flowering Seasons extended from February to August and 22 plants flowered in October and December. Spores are produce by *Equisetum arvense*. Tables 4 & 5 showed that out of total the month of March had the high flowering season, 51 species (24%) were blossomed. During April, May, June, July, August, October and December the flowering species percentage was 42 (19.7%), 32 (15%), 10 (4.6%), 07 (8%), 22 (10.3%), 02 (1%) and 20 (9.3%) respectively.

**Fruiting phase:**

Fruiting species showed that from April to June 70 species (32.8%) fruiting stage, while 49 species (23%) were from August to October and fruits produced in various months of the year were 47 species (22%). June month with high fruiting plants species with 36 (17%) followed by April with 34 (16%) species. The percentage of fruiting species in February 9 (4.2%), March 11 (5.1%), May 14 (6.5%), July 5 (2.3%), August 21 (9.8%), September 28 (13.1%), October 07 (3.2%) and in November 1 (0.4%), While January and December have no fruiting plants.

**Vegetative phase:**

The major bulk of the flora showed that total 189 species (88.7%) were in vegetative phase. March with 59 (27.6%) followed by April 42 (19.7%) species. The 6 species (2.8%) seedlings including *Convolvulus arvensis, Cynodon dactylon, Taraxacum officinale, Datura alba, Desmostachya bipinata* and *Urtica pilulifera* were seen throughout the year. *Collegonum polygonoides, Periploca aphylla, Vitex negundo* and *Equisetum arvensis* etc. were not observed in seedling stage. February with 22 (10.3%), April 24 (11.2%), October 21 (9.8%), December 24 (11.2%) species were present. The remaining 39 (18.3%) were vegetative species in the other months of the year.Similar results were carried out by Malik *et al*., (2007) who stated that July and August were high flowering months. Golluscio *et al*., (2005) stated that phonological activity of grasses were higher in autumn and winter. Yadav and Yadav *et al*., (2008) observed during September woody species in majority have fruiting. Jadeja & Nakar (2010) reported that 50% species produce fruits in the month of December. Nath *et al.,* (2008) stated that climatic and biotic factors were important factors in plant phenologies. Singh & Kushwaha, (2005) stated that climate change effect the length of growing period.

**Table 1. Phenolgical study of Darazinda during 12 months of the year**

| **S. No** | **Species** | **Jan** | **Feb** | **Mar** | **Apr** | **May** | **Jun** | **July** | **Aug** | **Sep** | **Oct** | **Nov** | **Dec** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A .Trees** | | | | | | | | | | | | | |
| **1** | *Acacia modesta* Wall. | - | - | - | V | Fl | Fr | - | - | - | Pr | - | - |
| **2** | *Acacia nilotica* (L.) Wid. ex Delile | - | - | - | - | V | - | - | Fl | Fr | - | Pr | - |
| **3** | *Albizia lebbeck* (L.) Benth. | - | - | - | V | Fl | Fr | - | - | - | Pr | - | - |
| **4** | *Bombix ceba* | - | - | - | V | Fl | Fr | - | - | - | Pr | - | - |
| **5** | *Buxus wallichiana Baill.* | - | - | - | V | Fl | Fr | - | - | - | Pr | - | - |
| **6** | *Citrus medica* | - | Fl | Fr | - | - | - | Pr | - | - | - | - | V |
| **7** | *Cordia myxa L* | - | - | - | V | Fl | Fr | - | - | - | Pr | - | - |
| **8** | *Dalbergia sissoo* Roxb. | - | V | - | Fl | Fr | - | - | - | - | - | Pr | - |
| **9** | *Ehrctia obtusifolia* | - | - | - | V | Fl | Fr | - | - | - | Pr | - | - |
| **10** | *Eucalyptus globulus*Labill. | - | V | Fl | Fr | - | - | - | - | - | Pr | - | - |
| **11** | *Eucalyptus lanceolatus* | - | V | Fl | Fr | - | - | - | - | - | Pr | - | - |
| **12** | *Mengifera indica* | - | - | - | V | Fl | Fr | - | - | - | Pr | - | - |
| **13** | *Morus alba*L. | - | V | Fl | Fr | - | - | - | - | - | Pr | - | - |
| **14** | *Moru snigra*L. | - | V | Fl | Fr | - | - | - | - | - | Pr | - | - |
| **15** | *Phoenix dactylifera*L. | - | - | - | Fl | - | - | Fr | - | - | Pr | - | V |
| **16** | *Populus alba* L. | - | - | - | V | Fl | Fr | - | - | - | Pr | - | - |
| **17** | *Prosopis farcta* (Banks & Sol.) Macbride. | - | - | V | - | Fl | - | Fr | - | - | - | - | Pr |
| **18** | *Psidium guajava* | - | - | - | V | Fl | Fr | - | - | - | Pr | - | - |
| **19** | *Punica granatum L* | - | - | - | V | Fl | Fr | - | - | - | Pr | - | - |
| **20** | *Monotheca buxifolia* (Falc.) A. DC. | - | - | V | - | Fl | Fr | - | - | - | Pr | - | - |
| **21** | *Musa paradisiaca L.* | - | - | - | V | Fl | Fr | - | - | - | Pr | - | - |
| **22** | *Syzygium cuminii* (L.) Skeels | - | - | - | V | Fl | Fr | - | - | - | Pr | - | - |
| **23** | *Tamarix aphylla* (L.) Karst. | - | - | - | V | - | - | - | Fl | - | Fr | - | Pr |
| **24** | *Zizyphusmauritiana*Lam. | - | - | - | Fr | - | Pr | - | V | - | Fl | - | - |
| **B . Shrubs** | | | | | | | | | | | | | |
| **1** | *Aerva javanica* (Burm.f.) Juss. Ex Schult. | - | - | V | - | - | Fl | - | - | Fr | - | - | Pr |
| **2** | *Abelmoschus esculentus* (L.) | - | - | V | - | - | Fl | Fr | - | - | - | - | Pr |
| **3** | *Calotropis procera*subsp. *Hamiltonii* (Wight) | - | - | V | - | Fl | - | - | Fr | - | - | - | Pr |
| **4** | *Calotropis Gigantea* L. R.Br | - | - | V | - | Fl | - | - | Fr | - | - | - | Pr |
| **5** | *Cannabis sativus* L*.* | - | - | V | - | Fl | - | - | Fr | - | - | - | Pr |
| **6** | *Capsicum annum L.* | - | - | V | - | Fl | - | - | Fr | - | - | - | Pr |
| **7** | *Calligonumpolygonoides* L. | - | - | - | - | - | Fl | - | - | Fr | - | - | Pr |
| **8** | *Capparis spinosa L* | - | - | V | - | - | Fl | - | - | Fr | - | - | Pr |
| **9** | *Datura innoxia* | - | - | - | Fl | - | Fr | - | - | - | - | - | Pr |
| **10** | *Dodonaea viscose* (L.) J acq. | - | - | V | Fl | - | Fr | - | - | - | - | - | Pr |
| **12** | *Ficuspalmate*L. | - | - | V | - | - | Fl | Fr | - | - | Pr | - | - |
| **13** | *Helianthus annus L* | - | - | V | Fl | - | Fr | - | - | - | - | - | Pr |
| **14** | *Hyoscyamus squarrosus Griffith.* | - | - | V | Fl | - | Fr | - | - | - | - | - | Pr |
| **15** | *Hibiscus trionum* | - | - | V | Fl | - | Fr | - | - | - | - | - | Pr |
| **16** | *Melia azedarach L.* | - | - | V | - | Fl | - | - | Fr | - | - | - | Pr |
| **17** | *Mirabilis jalapa L.* | - | - | V | Fl | - | Fr | - | - | - | - | - | Pr |
| **18** | *Nannorrphs ritchiana* H. Wendl. | - | - | - | V | - | - | - | - | - | - | - | - |
| **19** | *Neriumindicum*Mill. | - | - | V | Fl | - | Fr | - | - | - | Pr | - | - |
| **20** | *Ocimum bascillicum L.* | - | - | V | Fl | - | Fr | - | - | - | Pr | - | - |
| **21** | *Olea ferruginea* Royle. | - | - | V | Fl | - | Fr | - | - | - | Pr | - | - |
| **22** | *Periploca aphylla* Decne. | - | - | - | - | - | - | - | Fl | Fr | - | - | Pr |
| **23** | *Rhazya stricta* Decne. | - | - | V | - | - | - | Fl | Fr | - | - | - | Pr |
| **24** | *Ricinus communis* | - | - | Fl | - | Fr | - | Pr | - | - | V | - | - |
| **25** | *Rosa indica* L. | - | - | Fl | - | Fr | - | Pr | - | - | V | - | - |
| **26** | *Salvadora oleoides* Decne. | - | - | - | - | - | - | Fl | - | Fr | - | Pr | - |
| **27** | *Suaeda fruticosa* Forssk. ex J. F. Gmelin | - | V | - | - | - | - | - | Fl | Fr | - | - | Pr |
| **28** | *Tamarix dioica* Roxb. ex Roth. | - | - | - | V | - | - | - | Fl | - | Fr | - | Pr |
| **29** | *Vitex negundo*L. | - | - | - | - | - | - | Fl | - | Fr | - | Pr | - |
| **30** | *Vites vinifera L.* | - | - | - | - | - | - | - | Fl | - | Fr | - | Pr |
| **31** | *Withania coagulans* (Stocks) Dunal | - | - | - | V | - | - | - | Fl | Fr | - | - | Pr |
| **32** | *Withania somnifera (L.) Dunal.* | - | - | - | V | - | - | - | Fl | Fr | - | - | Pr |
| **33** | *Zizyphus nummularia* (Burm. f.) Wight & Arn. | - | - | - | - | V | - | Fl | - | Fr | - | - | Pr |
| **34** | *Zizyphus oxyphylla* Edge | - | - | - | - | V | - | Fl | - | Fr | - | - | Pr |
| **C. Herbs** | | | | | | | | | | | | | |
| **1** | *Adiantum capillusveneris L* | - | - | V | - | - | - | - | Fl | - | Fr | - | Pr |
| **2** | *Achyranthesaspera* L. | - | - | V | - | - | - | - | Fl | - | Fr | - | Pr |
| **3** | *Achyranthus biclentata* | - | - | V | - | - | - | - | Fl | - | Fr | - | Pr |
| **4** | *Agaricus campestris* L. | - | - | - | - | - | - | - | - | - | Fr | - | Pr |
| **5** | *Allium cepa* L. | - | - | Fl | - | Fr | - | Pr | - | - | V | - | - |
| **6** | *Allium sativum* L. | - | - | Fl | - | Fr | - | Pr | - | - | V | - | - |
| **7** | *Amaranthus viridis* L. | - | - | - | - | V | - | Fl | Fr | - | Pr | - | - |
| **8** | *Anagallis arvensis* L. | - | - | - | V | Fl | Fr | - | - | - | - | Pr | - |
| **9** | *Aristida adscensionis* L. | - | - | - | - | - | V | - | Fl | Fr | - | - | Pr |
| **10** | *Aristida cyanantha* Nees ex Steud. | - | - | V | Fl | Fr | - | - | - | - | Pr | - | - |
| **11** | *Astragalus psilocentros Frisch.* | - | - | Fl | Fr | - | - | Pr | - | - | - | V | - |
| **12** | *Asparagus gracilis Royle.* | - | - | V | - | - | - | - | Fl | - | - | - | Pr |
| **13** | *Asphodelus tenufolius L.* | - | - | Fl | Fr | - | - | Pr | - | - | - | V | - |
| **14** | *Apluda mutica* | - | - | V | Fl | Fr | - | - | - | - | - | - | Pr |
| **15** | *Arabidoptis thaliana* | - | - | - | - | - | V | - | Fl | Fr | - | - | Pr |
| **16** | *Argyrolobium roseum* | - | - | - | - | - | V | - | Fl | Fr | - | - | Pr |
| **17** | *Arndu dedonix* | - | - | - | - | - | V | - | Fl | Fr | - | - | Pr |
| **18** | *Artemisia scoparaia. Waldst & Kitam* | - | - | V | - | - | - | - | Fl | Fr | - | - | Pr |
| **19** | *Avena sativa* L. | - | - | Fl | Fr | - | Pr | - | - | - | - | V | - |
| **20** | *Brassica napus L.* | - | Fr | Pr | - | - | - | - | - | - | V | - | Fl |
| **21** | *Brassica olaraceae* L. | - | - | Fl | - | Fr | - | Pr | - | - | V | - | - |
| **22** | *Brassica campestris* | - | Fr | Pr | - | - | - | - | - | - | V | - | Fl |
| **23** | *Brachiaria ramose* | - | - | - | - | - | - | - | Pr |  | Fl | Fr | - |
| **24** | *Brachiaia reptans* | - | - | - | - | - | V | - | Fl | Fr | - | - | Pr |
| **25** | *Bromus japonica* Thunb. | - | - | - | - | - | V | - | Fl | Fr | - | - | Pr |
| **26** | *Caralluma tuberculata* N. E. Brown | - | - | V | - | - | - | - | - | - | - | - | - |
| **27** | *Carthamus oxycantha Bieb* | - | - | V | Fl | - | Fr | - | - | - | - | - | Pr |
| **28** | *Celosia cristata Linn.* | - | - | - | - | - | V | - | Fl | Fr | - | - | Pr |
| **29** | *Cenchrus ciliaris* L. | - | - | V | Fl | Fr | - | - | - | - | Pr | - | - |
| **30** | *Cucumis sativus* Linn. | - | - | V | - | - | - | Fr | - | - | - | - | Pr |
| **31** | *Cacumis propheterum* | - | - | V | Fl | Fr | - | - | - | - | Pr | - | - |
| **32** | *Chenopodium album* L. | - | - | Fl | Fr | - | - | Pr | - | - | - | - | V |
| **33** | *Chenopodium ambrosioides* L. | - | - | Fl | Fr | - | - | Pr | - | - | - | - | V |
| **34** | *Chenopodium murale* L. | - | - | - | - | - | V | Fl | - | Fr | - | - | Pr |
| **35** | *Chenopodium nepalense* Colla | - | - | - | - | - | V | Fl | - | Fr | - | - | Pr |
| **36** | *Cicer arietinum* L. | - | Fl | Fr | - | Pr | - | - | - | - | V | - | - |
| **37** | *Cistinche tubelosa* | - | - | V | Fl | - | Pr | - | - | - | - | - | - |
| **38** | *Cleome brachycarpa* Vahl ex DC. | - | Fr | - | - | - | - | Pr | - | V | - | - | Fl |
| **39** | *Convolvulus arvensis* L. | - | - | Fl | Fr | - | - | Pr | - | - | - | - | - |
| **40** | *Convolvulus prostrates* Forssk. | - | - | - | V | - | - | - | Fl | Fr | - | - | Pr |
| **41** | *Conyza bonariensis* | - | - | V | - | Fl | Fr | - | - | - | Pr | - | - |
| **42** | *Conyza canadensis* (L.) Cronquist | - | - | V | - | Fl | Fr | - | - | - | Pr | - | - |
| **43** | *Coriandrium sativum* L*.* | - | - | V | Fl | - | Fr | - | - | Pr | - | - | - |
| **44** | *Coronopus didymus* (L.) Smith | - | - | V | Fl | - | Fr | - | - | - | Pr | - | - |
| **45** | *Cucurbita maxima* | - | - | V | - | Fl | - | Fr | - | - | - | - | Pr |
| **46** | *Cucurbita pepo* | - | - | V | - | Fl | - | Fr | - | - | - | - | Pr |
| **47** | *Cuscuta reflexa* Roxb. | - | - | Fl | - | Fr | - | - | - | - | Pr | - | - |
| **48** | *Cymbopogon jwarancusa* (Jones) Schult. | - | V | - | Fl | - | Fr | - | - | - | - | Pr | - |
| **49** | *Cynoglossum lanceolatum* Forssk. | - | - | - | - | V | Fl | - | - | Fr | - | - | Pr |
| **50** | *Cynodon dactylon* (L.) Pers. | - | - | Fl | Fr | - | Pr | - | - | - | - | - | - |
| **51** | *Cyprus elumoids* L. | - | - | V | Fl | Fr | - | - | - | - | Pr | - | - |
| **52** | *Cyprus rotundus* L. | - | Fr | - | - | - | - | Pr | - | - | V | - | Fl |
| **53** | *Dactyloctenium carstatum* | - | - | V | - | Fl | Fr | - | - | - | Pr | - | - |
| **54** | *Dactyloctenium aegyptium* (L.) Willd. | - | - | V | - | Fl | Fr | - | - | - | Pr | - | - |
| **55** | *Daucus carrota* L. | - | Fl | Fr | - | Pr | - | - | - | - | V | - | - |
| **56** | *Datura alba* Nees | - | - | - | Fl | - | Fr | - | - | - | - | - | Pr |
| **57** | *Desmostachya bipinnata* (L.) Stap f. | - | - | - | - | - | Fl | - | Fr | - | - | - | Pr |
| **58** | *Dichanthium annulatum* (Forssk.) Stap f. | - | - | Fr | - | - | - | Pr | - | - | V | - | Fl |
| **59** | *Dicleptera bupleuroides* | - | V | - | Fl | - | Fr | - | - | - | - | - | Pr |
| **60** | *Digeria muricata* | - | V | - | Fl | - | Fr | - | - | - | - | - | Pr |
| **61** | *Dinebra retroflora* | - | V | - | Fl | - | Fr | - | - | - | - | - | Pr |
| **62** | *Disteria cilians* | - | V | - | Fl | - | Fr | - | - | - | - | - | Pr |
| **63** | *Echinochloa colona* (L.) Link. | - | - | Fr | - | - | - | Pr | - | - | V | - | Fl |
| **64** | *Echinops echinatus D.C* | - | - | Fr | - | - | - | Pr | - | - | V | - | Fl |
| **65** | *Eleocharis palastris* | - | - | V | Fl | - | - | Pr | - | - | - | - | Fl |
| **66** | *Eragrostisminor* Host | - | - | V | - | - | Fl | - | Fr | - | - | - | Pr |
| **67** | *Equisetumarvense*L. | - | - | - | Fr | - | - | Pr | - | - | - | - | - |
| **68** | *Euphorbia helioscopia* L. | - | - | Fl | Fr | - | - | Pr | - | - | - | - | V |
| **69** | *Euphorbia hirta* | - | - | - | - | V | - | Fl | - | Fr | Pr | - | - |
| **70** | *Euphorbia prostrate* Ait. | - | - | - | - | V | - | Fl | - | Fr | Pr | - | - |
| **71** | *Fagonia indica* var*. schweinfurthii* Hadidi | - | - | - | - | V | - | Fl | - | Fr | Pr | - | - |
| **72** | *Filago arenaria* (Smoljan) Chrtek & Holub | - | - | V | - | Fl | - | - | Fr | - | Pr | - | - |
| **73** | *Filago hunclwarica* | - | - | V | - | Fl | - | - | Fr | - | Pr | - | - |
| **74** | *Foeniculum valgare* Mill. | - | - | V | - | Fl | - | - | Fr | - | Pr | - | - |
| **75** | *Fumaria indica* (Hausskn) Pugsley | - | - | Fl | Fr | - | - | Pr | - | - | - | V | - |
| **76** | *Galium aparine* | - | - | Fl | Fr | - | - | Pr | - | - | - | V | - |
| **77** | *Galium tricorne* | - | - | Fl | Fr | - | - | Pr | - | - | - | V | - |
| **78** | *Heliotropium elipticum* Ledeb. | - | - | - | - | V | - | Fl | - | Fr | Pr | - | - |
| **79** | *Heliotropium europaeum* L. | - | - | Fl | Fr | - | - | Pr | - | - | - | V | - |
| **80** | *Hordeum vulgare* L. | - | - | Fl | Fr | - | - | Pr | - | - | - | V | - |
| **81** | *Hyosyamus niger* | - | - | V | Fl | - | Fr | - | - |  | - | Pr | - |
| **82** | *Hyosyamus insanus* | - | - | V | Fl | - | Fr | - | - | - | - | Pr | - |
| **83** | *Imperata cylindrica* L. | - | - | - | - | V | - | Fl | - | Fr | Pr | - | - |
| **84** | *Iphiona scabra DC.k* | - | - | Fl | - | Fr | - | - | - | - | V | - | Pr |
| **85** | *Kickxia incana (Wall) Penn.* | - | - | Fl | - | - | - | Pr | - | - | V | - | Fl |
| **86** | *Lactuca serriola L.* | - | - | Fl | Fr | - | - | Pr | - | - | - | - | V |
| **87** | *Lactuca sativa L.* | - | - | Fl | Fr | - | - | Pr | - | - | - | - | V |
| **88** | *Launaea nudicaulis* (L.) Hook. f. | - | - | - | - | V | - | Fl | - | Fr | Pr | - | - |
| **89** | *Launaea procumbens* Roxb. | - | - | - | - | V | - | Fl | - | Fr | Pr | - | - |
| **90** | *Lepidium draba* | - | - | Fr | - | - | - | Pr | - | - | V | - | Fl |
| **91** | *Lindenbergia indica* | - | - | Fr | - | - | - | Pr | - | - | V | - | Fl |
| **92** | *Lolium temulentum* Linn. | - | - | Fr | - | - | - | Pr | - | - | V | - | Fl |
| **93** | *Luffa clyndrica* (L.) Roem | - | - | Fr | - | - | - | Pr | - | - | V | - | Fl |
| **94** | *Lycopersicom esculentum Mill.* | - | - | Fr | - | - | - | Pr | - | - | V | - | Fl |
| **95** | *Malcolmia scorpioides* (Bunge) Boiss. | - | Fl | - | Fr | - | - | Pr | - | - | - | V | - |
| **96** | *Malcolmia africana* (L.) R. Br. | - | - | Fl | Fr | - | - | Pr | - | - | - | - | V |
| **97** | *Malvastrum coromandelianum* (L.) Garcke | - | - | Fl | Fr | - | - | Pr | - | - | - | - | V |
| **98** | *Medicago laciniata* (L.) Mill. | - | - | Fl | Fr | - | - | Pr | - | - | - | - | V |
| **99** | *Melilotus indica* (L.) All. | - | - | Fl | Fr | - | - | Pr | - | - | - | - | V |
| **100** | *Melilotuslongifolia* Desr. | - | - | Fl | Fr | - | - | Pr | - | - | - | - | V |
| **101** | *Mentha arvensis L.* | - | - | - | Fl | Fr | - | - | Pr | - | - | - | V |
| **102** | *Mentha longifolia* (L.) | - | - | - | Fl | Fr | - | - | Pr | - | - | - | V |
| **103** | *Morchella esculenta* Fries | - | - | - | V | Fr | - | - | Pr | - | - | - | - |
| **104** | *Oligomeris linifolia* (Vahl.) Macbride | - | - | Fl | Fr | - | - | Pr | - | - | - | - | V |
| **105** | *Oryza sativa* L. | - | - | V | - | - | - | Fl | Fr | - | Pr | - | - |
| **106** | *Parthenium hysterophous L.* | - | V | Fl | Fr | - | - | Pr | - | - | - | - | - |
| **107** | *Papaver somniferum* L. | - | - | V | - | - | - | Fl | Fr | - | Pr | - | - |
| **108** | *Peganum harmala L.* | - | V | Fl | - | Fr | - | Pr | - | - | - | - | - |
| **109** | *Pennisetum oriantale* L. | - | - | V | - | - | - | Fl | Fr | - | Pr | - | - |
| **110** | *Portulaca quadrifida* L. | - | V | Fl | Fr | - | - | Pr | - | - | - | - | - |
| **111** | *Phalaris minor* Retz. | - | V | - | Fl | Fr | - | Pr | - | - | - | - | - |
| **112** | *Phragmites karka* (Retz.) Trin. ex. Steud. | - | - | - | V | - | - | - | Fl | Fr | - | - | Pr |
| **113** | *Plantago lanceolata* L. | - | - | V | - | Fl | Fr | - | - | - | Pr | - | - |
| **114** | *Plantago major* L. | - | - | V | - | Fl | Fr | - | - | - | Pr | - | - |
| **115** | *Polypogon monspeliensis* (L.) Desf. | - | V | Fl | Fr | - | - | Pr | - | - | - | - | - |
| **116** | *Poa annua* L. | - | Fr | - | - | - | - | Pr | - | - | - | V | Fl |
| **117** | *Poa infirma H. B. K.* | - | Fr | - | - | - | - | Pr | - | - | - | V | Fl |
| **118** | *Polygonum plebejum* R. Br. | - | Fr | - | - | - | - | Pr | - | - | - | V | Fl |
| **119** | *Pulicaria crispa* (Forssk.) B. H. | - | - | V | - | Fl | Fr | - | - | - | Pr | - | - |
| **120** | *Raphanus sativus L* | - | Fr | - | - | - | - | Pr | - | - | - | V | Fl |
| **121** | *Ranunculus muricatus* L. | - | - | V | - | Fl | Fr | - | - | - | Pr | - | - |
| **122** | *Reseda odorata* L. | - | Fr | - | - | - | - | Pr | - | - | - | V | Fl |
| **123** | *Rumex dentatus* L. | - | V | Fl | Fr | - | - | Pr | - | - | - | - | - |
| **124** | *Rumex hastatus* | - | V | Fl | Fr | - | - | Pr | - | - | - | - | - |
| **125** | *Saccharum munja* Roxb. | - | V | Fl | Fr | - | - | - | - | - | - | - | Pr |
| **126** | *Saccharum bengalense* Retz | - | V | - | Fl | - | Fr | - | - | - | Pr | - | - |
| **127** | *Salvia aegyptiaca L.* | - | - | V | Fl | - | Fr | - | Pr | - | - | - | V |
| **128** | *Saponaria vaccaria* | - | - | V | Fl | - | Fr | - | Pr | - | - | - | V |
| **129** | *Saussurea heteromalla (D. Don.) Hand* | - | - | V | Fl | - | Fr | - | Pr | - | - | - | V |
| **130** | *Setaria vercillata (L.)* | - | - | - | - | Fl | - | - | - | - | Pr | V | Fl |
| **131** | *Sisymbrium irio* L. | - | - | V | Fl | - | Fr | - | Pr | - | - | - | - |
| **132** | *Solanum melangena* | - | - | V | Fl | - | Fr | - | Pr | - | - | - | - |
| **133** | *Solanum surattense* Burm. f. | - | - | - | - | V | Fl | - | Fr | - | - | - | Pr |
| **134** | *Solanum tuberosum* | - | - | V | Fl | - | Fr | - | Pr | - | - | - | - |
| **135** | *Sonchus asper* (L.) Hill | - | - | Fl | Fr | - | - | Pr | - | - | - | - | V |
| **136** | *Sonchus oleraceus* L. | - | - | Fl | Fr | - | - | Pr | - | - | - | - | V |
| **137** | *Sorghum vulgare (L.) Pers.* | - | - | Fl | Fr | - | - | Pr | - | - | - | - | V |
| **138** | *Stellaria media L. Vill* | - | - | Fl | Fr | - | - | Pr | - | - | - | - | V |
| **139** | *Taraxacum officinale* F.H. Wigg. | - | - | Fl | Fr | - | - | Pr | - | - | - | - | - |
|  | *Thymelaea passerine* |  |  |  |  |  |  |  |  |  |  |  |  |
| **140** | *Torilis japonica* (Houtt.) DC. | - | - | V | Fl | Fr | - | Pr | - | - | - | - | - |
| **141** | *Trianthema portulacastrum* L. | - | - | V | - | Fl | Fr | - | - | - | Pr | - | - |
| **142** | *Tribulus terrestris* L. | - | - | - | - | V | Fl | - | Fr | - | - | - | Pr |
| **143** | *Trifolium alexandrianum* L. | - | - | - | Fl | Fr | Pr | - | - | - | V | - | - |
| **144** | *Trigonella mcisa* | - | - | V | Fl | Fr | - | Pr | - | - | - | - | - |
| **145** | *Triticum aestivum* L. | - | - | Fl | Fr | - | Pr | - | - | - | - | V | - |
| **146** | *Typhalatifolia* L. | - | - | V | - | Fl | - | - | Fr | - | - | - | Pr |
| **147** | *Typha minima Funck er Hoppe* | - | - | V | - | Fl | - | - | Fr | - | - | - | Pr |
| **148** | *Utrica pilulifera L.* | - | - | V | Fr | - | Pr | - | - | - | - | Pr | - |
| **149** | *Verbena hybrid* | - | V | Fl | Fr | - | - | Pr | - | - | - | - | - |
| **150** | *Verbena officinale* | - | V | Fl | Fr | - | - | Pr | - | - | - | - | - |
| **151** | *Veronica aqutica* Bern. | - | V | Fl | Fr | - | - | Pr | - | - | - | - | - |
| **152** | *Vicia sativa L.* | - | - | Fl | Fr | - | - | Pr | - | - | - | - | V |
| **153** | *Xanthium strumarium* L. | - | - | Fl | Fr | - | - | Pr | - | - | - | - | V |
| **154** | *Zea mays* L. | - | - | - | - | V | - | Fl | Fr | - | Pr | - | - |
| **155** | Zelays *petendra (L.) C. Jeffery* | - | - | - | - | V | - | Fl | Fr | - | Pr | - | - |

**Key: V= Vegetative stage; FL= Flowering stage; FR =Fruitingstage and PR = Post Reproductive stage**

**Table No 2. Summary of phenological events (Table 1) of flora of Darazinda F.R D.I Khan**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S. No** | **Phenological stage** | **Months** | | | | | | | | | | | |
| **Jan** | **Feb** | **Mar** | **Apr** | **May** | **June** | **July** | **Aug** | **Sep** | **Oct** | **Nov** | **Dec** |
| **1** | **Vegetative (V)** | - | 22 (10.3%) | 59 (27.6%) | 24 (11.2%) | 12 (5.6%) | 8 (3.7%) | 0 | 1 (0.4%) | 2 (1%) | 21 (9.8%) | 16 (7.5%) | 24 (11.2%) |
| **2** | **Flowering (FL)** | - | 04 (1.8%) | 51 (24%) | 42 (19.7%) | 32 (15%) | 10 (4.6%) | 17 (8%) | 22 (10.3%) | - | 2 (1%) | - | 20 (9.3%) |
| **3** | **Fruiting (FR)** | - | 09 (4.2%) | 11 (5.1%) | 34 (16%) | 14 (6.5%) | 36 (17%) | 05 (2.3%) | 21 (9.8%) | 28 (13.1%) | 07 (3.2%) | 01 (0.4%) | - |
| **4** | **Post Reproductive (PR)** | - | - | 02 (1%) | - | 02 (1%) | 05 (2.3%) | 62 (29.1%) | 10 (4.6%) | 12 (5.6%) | 55 (25.8%) | 09 (4.2%) | 62 (29.1%) |

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