

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 phenological 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 Larga 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 phenological 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. Phenological 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	<i>Acacia modesta</i> Wall.	-	-	-	V	Fl	Fr	-	-	-	Pr	-	-
2	<i>Acacia nilotica</i> (L.) Wid. ex Delile	-	-	-	-	V	-	-	Fl	Fr	-	Pr	-
3	<i>Albizia lebbeck</i> (L.) Benth.	-	-	-	V	Fl	Fr	-	-	-	Pr	-	-
4	<i>Bombix ceiba</i>	-	-	-	V	Fl	Fr	-	-	-	Pr	-	-
5	<i>Buxus wallichiana</i> Baill.	-	-	-	V	Fl	Fr	-	-	-	Pr	-	-
6	<i>Citrus medica</i>	-	Fl	Fr	-	-	-	Pr	-	-	-	-	V
7	<i>Cordia myxa</i> L.	-	-	-	V	Fl	Fr	-	-	-	Pr	-	-
8	<i>Dalbergia sissoo</i> Roxb.	-	V	-	Fl	Fr	-	-	-	-	-	Pr	-
9	<i>Ehrctia obtusifolia</i>	-	-	-	V	Fl	Fr	-	-	-	Pr	-	-
10	<i>Eucalyptus globulus</i> Labill.	-	V	Fl	Fr	-	-	-	-	-	Pr	-	-
11	<i>Eucalyptus lanceolatus</i>	-	V	Fl	Fr	-	-	-	-	-	Pr	-	-
12	<i>Mengifera indica</i>	-	-	-	V	Fl	Fr	-	-	-	Pr	-	-
13	<i>Morus alba</i> L.	-	V	Fl	Fr	-	-	-	-	-	Pr	-	-
14	<i>Moru snigra</i> L.	-	V	Fl	Fr	-	-	-	-	-	Pr	-	-
15	<i>Phoenix dactylifera</i> L.	-	-	-	Fl	-	-	Fr	-	-	Pr	-	V
16	<i>Populus alba</i> L.	-	-	-	V	Fl	Fr	-	-	-	Pr	-	-
17	<i>Prosopis farcta</i> (Banks & Sol.) Macbride.	-	-	V	-	Fl	-	Fr	-	-	-	-	Pr
18	<i>Psidium guajava</i>	-	-	-	V	Fl	Fr	-	-	-	Pr	-	-
19	<i>Punica granatum</i> L.	-	-	-	V	Fl	Fr	-	-	-	Pr	-	-
20	<i>Monotheca buxifolia</i> (Falc.) A. DC.	-	-	V	-	Fl	Fr	-	-	-	Pr	-	-
21	<i>Musa paradisiaca</i> L.	-	-	-	V	Fl	Fr	-	-	-	Pr	-	-
22	<i>Syzygium cuminii</i> (L.) Skeels	-	-	-	V	Fl	Fr	-	-	-	Pr	-	-
23	<i>Tamarix aphylla</i> (L.) Karst.	-	-	-	V	-	-	-	Fl	-	Fr	-	Pr
24	<i>Zizyphus mauritiana</i> Lam.	-	-	-	Fr	-	Pr	-	V	-	Fl	-	-
B. Shrubs													
1	<i>Aerva javanica</i> (Burm.f.) Juss. Ex Schult.	-	-	V	-	-	Fl	-	-	Fr	-	-	Pr
2	<i>Abelmoschus esculentus</i> (L.)	-	-	V	-	-	Fl	Fr	-	-	-	-	Pr
3	<i>Calotropis procera</i> sub sp. <i>Hamiltonii</i> (Wight)	-	-	V	-	Fl	-	-	Fr	-	-	-	Pr
4	<i>Calotropis Gigantea</i> L. R.Br	-	-	V	-	Fl	-	-	Fr	-	-	-	Pr
5	<i>Cannabis sativus</i> L.	-	-	V	-	Fl	-	-	Fr	-	-	-	Pr
6	<i>Capsicum annum</i> L.	-	-	V	-	Fl	-	-	Fr	-	-	-	Pr
7	<i>Calligonum polygonoides</i> L.	-	-	-	-	-	Fl	-	-	Fr	-	-	Pr

S. No	Species	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
8	<i>Capparis spinosa</i> L.	-	-	V	-	-	Fl	-	-	Fr	-	-	Pr
9	<i>Datura innoxia</i>	-	-	-	Fl	-	Fr	-	-	-	-	-	Pr
10	<i>Dodonaea viscosa</i> (L.) J acq.	-	-	V	Fl	-	Fr	-	-	-	-	-	Pr
12	<i>Ficus palmate</i> L.	-	-	V	-	-	Fl	Fr	-	-	Pr	-	-
13	<i>Helianthus annuus</i> L.	-	-	V	Fl	-	Fr	-	-	-	-	-	Pr
14	<i>Hyoscyamus squarrosus</i> Griffith.	-	-	V	Fl	-	Fr	-	-	-	-	-	Pr
15	<i>Hibiscus trionum</i>	-	-	V	Fl	-	Fr	-	-	-	-	-	Pr
16	<i>Melia azedarach</i> L.	-	-	V	-	Fl	-	-	Fr	-	-	-	Pr
17	<i>Mirabilis jalapa</i> L.	-	-	V	Fl	-	Fr	-	-	-	-	-	Pr
18	<i>Nannorrhops ritchiana</i> H. Wendl.	-	-	-	V	-	-	-	-	-	-	-	-
19	<i>Nerium indicum</i> Mill.	-	-	V	Fl	-	Fr	-	-	-	Pr	-	-
20	<i>Ocimum basilicum</i> L.	-	-	V	Fl	-	Fr	-	-	-	Pr	-	-
21	<i>Olea ferruginea</i> Royle.	-	-	V	Fl	-	Fr	-	-	-	Pr	-	-
22	<i>Periploca aphylla</i> Decne.	-	-	-	-	-	-	-	Fl	Fr	-	-	Pr
23	<i>Rhazya stricta</i> Decne.	-	-	V	-	-	-	Fl	Fr	-	-	-	Pr
24	<i>Ricinus communis</i>	-	-	Fl	-	Fr	-	Pr	-	-	V	-	-
25	<i>Rosa indica</i> L.	-	-	Fl	-	Fr	-	Pr	-	-	V	-	-
26	<i>Salvadora oleoides</i> Decne.	-	-	-	-	-	-	Fl	-	Fr	-	Pr	-
27	<i>Suaeda fruticosa</i> Forssk. ex J. F. Gmelin	-	V	-	-	-	-	-	Fl	Fr	-	-	Pr
28	<i>Tamarix dioica</i> Roxb. ex Roth.	-	-	-	V	-	-	-	Fl	-	Fr	-	Pr
29	<i>Vitex negundo</i> L.	-	-	-	-	-	-	Fl	-	Fr	-	Pr	-
30	<i>Vites vinifera</i> L.	-	-	-	-	-	-	-	Fl	-	Fr	-	Pr
31	<i>Withania coagulans</i> (Stocks) Dunal	-	-	-	V	-	-	-	Fl	Fr	-	-	Pr
32	<i>Withania somnifera</i> (L.) Dunal.	-	-	-	V	-	-	-	Fl	Fr	-	-	Pr
33	<i>Zizyphus nummularia</i> (Burm. f.) Wight & Arn.	-	-	-	-	V	-	Fl	-	Fr	-	-	Pr
34	<i>Zizyphus oxyphylla</i> Edge	-	-	-	-	V	-	Fl	-	Fr	-	-	Pr
C. Herbs													
1	<i>Adiantum capillusveneris</i> L.	-	-	V	-	-	-	-	Fl	-	Fr	-	Pr
2	<i>Achyranthes aspera</i> L.	-	-	V	-	-	-	-	Fl	-	Fr	-	Pr
3	<i>Achyranthus biclentata</i>	-	-	V	-	-	-	-	Fl	-	Fr	-	Pr
4	<i>Agaricus campestris</i> L.	-	-	-	-	-	-	-	-	-	Fr	-	Pr
5	<i>Allium cepa</i> L.	-	-	Fl	-	Fr	-	Pr	-	-	V	-	-
6	<i>Allium sativum</i> L.	-	-	Fl	-	Fr	-	Pr	-	-	V	-	-
7	<i>Amaranthus viridis</i> L.	-	-	-	-	V	-	Fl	Fr	-	Pr	-	-
8	<i>Anagallis arvensis</i> L.	-	-	-	V	Fl	Fr	-	-	-	-	Pr	-
9	<i>Aristida adscensionis</i> L.	-	-	-	-	-	V	-	Fl	Fr	-	-	Pr
10	<i>Aristida cyanantha</i> Nees ex Steud.	-	-	V	Fl	Fr	-	-	-	-	Pr	-	-
11	<i>Astragalus psilocentros</i> Frisch.	-	-	Fl	Fr	-	-	Pr	-	-	-	V	-
12	<i>Asparagus gracilis</i> Royle.	-	-	V	-	-	-	-	Fl	-	-	-	Pr
13	<i>Asphodelus tenuifolius</i> L.	-	-	Fl	Fr	-	-	Pr	-	-	-	V	-

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14	<i>Apluda mutica</i>	-	-	V	Fl	Fr	-	-	-	-	-	-	Pr
15	<i>Arabidopsis thaliana</i>	-	-	-	-	-	V	-	Fl	Fr	-	-	Pr
16	<i>Argyrolobium roseum</i>	-	-	-	-	-	V	-	Fl	Fr	-	-	Pr
17	<i>Amdu dedonix</i>	-	-	-	-	-	V	-	Fl	Fr	-	-	Pr
18	<i>Artemisia scorparaia</i> . Waldst & Kitam	-	-	V	-	-	-	-	Fl	Fr	-	-	Pr
19	<i>Avena sativa</i> L.	-	-	Fl	Fr	-	Pr	-	-	-	-	V	-
20	<i>Brassica napus</i> L.	-	Fr	Pr	-	-	-	-	-	-	V	-	Fl
21	<i>Brassica oleraceae</i> L.	-	-	Fl	-	Fr	-	Pr	-	-	V	-	-
22	<i>Brassica campestris</i>	-	Fr	Pr	-	-	-	-	-	-	V	-	Fl
23	<i>Brachiaria ramose</i>	-	-	-	-	-	-	-	Pr		Fl	Fr	-
24	<i>Brachiaia reptans</i>	-	-	-	-	-	V	-	Fl	Fr	-	-	Pr
25	<i>Bromus japonica</i> Thunb.	-	-	-	-	-	V	-	Fl	Fr	-	-	Pr
26	<i>Caralluma tuberculata</i> N. E. Brown	-	-	V	-	-	-	-	-	-	-	-	-
27	<i>Carthamus oxycantha</i> Bieb	-	-	V	Fl	-	Fr	-	-	-	-	-	Pr
28	<i>Celosia cristata</i> Linn.	-	-	-	-	-	V	-	Fl	Fr	-	-	Pr
29	<i>Cenchrus ciliaris</i> L.	-	-	V	Fl	Fr	-	-	-	-	Pr	-	-
30	<i>Cucumis sativus</i> Linn.	-	-	V	-	-	-	Fr	-	-	-	-	Pr
31	<i>Cacumis propheterum</i>	-	-	V	Fl	Fr	-	-	-	-	Pr	-	-
32	<i>Chenopodium album</i> L.	-	-	Fl	Fr	-	-	Pr	-	-	-	-	V
33	<i>Chenopodium ambrosioides</i> L.	-	-	Fl	Fr	-	-	Pr	-	-	-	-	V
34	<i>Chenopodium murale</i> L.	-	-	-	-	-	V	Fl	-	Fr	-	-	Pr
35	<i>Chenopodium nepalense</i> Colla	-	-	-	-	-	V	Fl	-	Fr	-	-	Pr
36	<i>Cicer arietinum</i> L.	-	Fl	Fr	-	Pr	-	-	-	-	V	-	-
37	<i>Cistinche tubelosa</i>	-	-	V	Fl	-	Pr	-	-	-	-	-	-
38	<i>Cleome brachycarpa</i> Vahl ex DC.	-	Fr	-	-	-	-	Pr	-	V	-	-	Fl
39	<i>Convolvulus arvensis</i> L.	-	-	Fl	Fr	-	-	Pr	-	-	-	-	-
40	<i>Convolvulus prostrates</i> Forssk.	-	-	-	V	-	-	-	Fl	Fr	-	-	Pr
41	<i>Conyza bonariensis</i>	-	-	V	-	Fl	Fr	-	-	-	Pr	-	-
42	<i>Conyza canadensis</i> (L.) Cronquist	-	-	V	-	Fl	Fr	-	-	-	Pr	-	-
43	<i>Coriandrium sativum</i> L.	-	-	V	Fl	-	Fr	-	-	Pr	-	-	-
44	<i>Coronopus didymus</i> (L.) Smith	-	-	V	Fl	-	Fr	-	-	-	Pr	-	-
45	<i>Cucurbita maxima</i>	-	-	V	-	Fl	-	Fr	-	-	-	-	Pr
46	<i>Cucurbita pepo</i>	-	-	V	-	Fl	-	Fr	-	-	-	-	Pr
47	<i>Cuscuta reflexa</i> Roxb.	-	-	Fl	-	Fr	-	-	-	-	Pr	-	-
48	<i>Cymbopogon jwarancusa</i> (Jones) Schult.	-	V	-	Fl	-	Fr	-	-	-	-	Pr	-
49	<i>Cynoglossum lanceolatum</i> Forssk.	-	-	-	-	V	Fl	-	-	Fr	-	-	Pr
50	<i>Cynodon dactylon</i> (L.) Pers.	-	-	Fl	Fr	-	Pr	-	-	-	-	-	-
51	<i>Cyprus elumoids</i> L.	-	-	V	Fl	Fr	-	-	-	-	Pr	-	-
52	<i>Cyprus rotundus</i> L.	-	Fr	-	-	-	-	Pr	-	-	V	-	Fl

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53	<i>Dactyloctenium carstatum</i>	-	-	V	-	Fl	Fr	-	-	-	Pr	-	-
54	<i>Dactyloctenium aegyptium</i> (L.) Willd.	-	-	V	-	Fl	Fr	-	-	-	Pr	-	-
55	<i>Daucus carota</i> L.	-	Fl	Fr	-	Pr	-	-	-	-	V	-	-
56	<i>Datura alba</i> Nees	-	-	-	Fl	-	Fr	-	-	-	-	-	Pr
57	<i>Desmostachya bipinnata</i> (L.) Stap f.	-	-	-	-	-	Fl	-	Fr	-	-	-	Pr
58	<i>Dichanthium annulatum</i> (Forssk.) Stap f.	-	-	Fr	-	-	-	Pr	-	-	V	-	Fl
59	<i>Dicleptera bupleuroides</i>	-	V	-	Fl	-	Fr	-	-	-	-	-	Pr
60	<i>Digeria muricata</i>	-	V	-	Fl	-	Fr	-	-	-	-	-	Pr
61	<i>Dinebra retroflora</i>	-	V	-	Fl	-	Fr	-	-	-	-	-	Pr
62	<i>Disteria cilians</i>	-	V	-	Fl	-	Fr	-	-	-	-	-	Pr
63	<i>Echinochloa colona</i> (L.) Link.	-	-	Fr	-	-	-	Pr	-	-	V	-	Fl
64	<i>Echinops echinatus</i> D.C	-	-	Fr	-	-	-	Pr	-	-	V	-	Fl
65	<i>Eleocharis palustris</i>	-	-	V	Fl	-	-	Pr	-	-	-	-	Fl
66	<i>Eragrostis minor</i> Host	-	-	V	-	-	Fl	-	Fr	-	-	-	Pr
67	<i>Equisetum arvense</i> L.	-	-	-	Fr	-	-	Pr	-	-	-	-	-
68	<i>Euphorbia helioscopia</i> L.	-	-	Fl	Fr	-	-	Pr	-	-	-	-	V
69	<i>Euphorbia hirta</i>	-	-	-	-	V	-	Fl	-	Fr	Pr	-	-
70	<i>Euphorbia prostrata</i> Ait.	-	-	-	-	V	-	Fl	-	Fr	Pr	-	-
71	<i>Fagonia indica</i> var. <i>Schwein furthii</i> Hadidi	-	-	-	-	V	-	Fl	-	Fr	Pr	-	-
72	<i>Filago arenaria</i> (Smoljan) Chrtek & Holub	-	-	V	-	Fl	-	-	Fr	-	Pr	-	-
73	<i>Filago huncularica</i>	-	-	V	-	Fl	-	-	Fr	-	Pr	-	-
74	<i>Foeniculum vulgare</i> Mill.	-	-	V	-	Fl	-	-	Fr	-	Pr	-	-
75	<i>Fumaria indica</i> (Hauskn) Pugsley	-	-	Fl	Fr	-	-	Pr	-	-	-	V	-
76	<i>Galium aparine</i>	-	-	Fl	Fr	-	-	Pr	-	-	-	V	-
77	<i>Galium tricorne</i>	-	-	Fl	Fr	-	-	Pr	-	-	-	V	-
78	<i>Heliotropium ellipticum</i> Ledeb.	-	-	-	-	V	-	Fl	-	Fr	Pr	-	-
79	<i>Heliotropium europaeum</i> L.	-	-	Fl	Fr	-	-	Pr	-	-	-	V	-
80	<i>Hordeum vulgare</i> L.	-	-	Fl	Fr	-	-	Pr	-	-	-	V	-
81	<i>Hyosyamus niger</i>	-	-	V	Fl	-	Fr	-	-	-	-	Pr	-
82	<i>Hyosyamus insanus</i>	-	-	V	Fl	-	Fr	-	-	-	-	Pr	-
83	<i>Imperata cylindrica</i> L.	-	-	-	-	V	-	Fl	-	Fr	Pr	-	-
84	<i>Iphiaea scabra</i> DC.k	-	-	Fl	-	Fr	-	-	-	-	V	-	Pr
85	<i>Kickxia incana</i> (Wall) Penn.	-	-	Fl	-	-	-	Pr	-	-	V	-	Fl
86	<i>Lactuca serriola</i> L.	-	-	Fl	Fr	-	-	Pr	-	-	-	-	V
87	<i>Lactuca sativa</i> L.	-	-	Fl	Fr	-	-	Pr	-	-	-	-	V
88	<i>Launaea nudicaulis</i> (L.) Hook. f.	-	-	-	-	V	-	Fl	-	Fr	Pr	-	-
89	<i>Launaea procumbens</i> Roxb.	-	-	-	-	V	-	Fl	-	Fr	Pr	-	-
90	<i>Lepidium draba</i>	-	-	Fr	-	-	-	Pr	-	-	V	-	Fl
91	<i>Lindenbergia indica</i>	-	-	Fr	-	-	-	Pr	-	-	V	-	Fl

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92	<i>Lolium temulentum</i> Linn.	-	-	Fr	-	-	-	Pr	-	-	V	-	Fl
93	<i>Luffa cylindrica</i> (L.) Roem	-	-	Fr	-	-	-	Pr	-	-	V	-	Fl
94	<i>Lycopersicon esculentum</i> Mill.	-	-	Fr	-	-	-	Pr	-	-	V	-	Fl
95	<i>Malcolmia scorpioides</i> (Bunge) Boiss.	-	Fl	-	Fr	-	-	Pr	-	-	-	V	-
96	<i>Malcolmia africana</i> (L.) R. Br.	-	-	Fl	Fr	-	-	Pr	-	-	-	-	V
97	<i>Malvastrum coromandelianum</i> (L.) Garcke	-	-	Fl	Fr	-	-	Pr	-	-	-	-	V
98	<i>Medicago laciniata</i> (L.) Mill.	-	-	Fl	Fr	-	-	Pr	-	-	-	-	V
99	<i>Melilotus indica</i> (L.) All.	-	-	Fl	Fr	-	-	Pr	-	-	-	-	V
100	<i>Melilotus longifolia</i> Desr.	-	-	Fl	Fr	-	-	Pr	-	-	-	-	V
101	<i>Mentha arvensis</i> L.	-	-	-	Fl	Fr	-	-	Pr	-	-	-	V
102	<i>Mentha longifolia</i> (L.)	-	-	-	Fl	Fr	-	-	Pr	-	-	-	V
103	<i>Morchella esculenta</i> Fries	-	-	-	V	Fr	-	-	Pr	-	-	-	-
104	<i>Oligomeris linifolia</i> (Vahl.) Macbride	-	-	Fl	Fr	-	-	Pr	-	-	-	-	V
105	<i>Oryza sativa</i> L.	-	-	V	-	-	-	Fl	Fr	-	Pr	-	-
106	<i>Parthenium hysterophorus</i> L.	-	V	Fl	Fr	-	-	Pr	-	-	-	-	-
107	<i>Papaver somniferum</i> L.	-	-	V	-	-	-	Fl	Fr	-	Pr	-	-
108	<i>Peganum harmala</i> L.	-	V	Fl	-	Fr	-	Pr	-	-	-	-	-
109	<i>Pennisetum orientale</i> L.	-	-	V	-	-	-	Fl	Fr	-	Pr	-	-
110	<i>Portulaca quadrifida</i> L.	-	V	Fl	Fr	-	-	Pr	-	-	-	-	-
111	<i>Phalaris minor</i> Retz.	-	V	-	Fl	Fr	-	Pr	-	-	-	-	-
112	<i>Phragmites karka</i> (Retz.) Trin. ex. Steud.	-	-	-	V	-	-	-	Fl	Fr	-	-	Pr
113	<i>Plantago lanceolata</i> L.	-	-	V	-	Fl	Fr	-	-	-	Pr	-	-
114	<i>Plantago major</i> L.	-	-	V	-	Fl	Fr	-	-	-	Pr	-	-
115	<i>Polypogon monspeliensis</i> (L.) Desf.	-	V	Fl	Fr	-	-	Pr	-	-	-	-	-
116	<i>Poa annua</i> L.	-	Fr	-	-	-	-	Pr	-	-	-	V	Fl
117	<i>Poa infirma</i> H. B. K.	-	Fr	-	-	-	-	Pr	-	-	-	V	Fl
118	<i>Polygonum plebejum</i> R. Br.	-	Fr	-	-	-	-	Pr	-	-	-	V	Fl
119	<i>Pulicaria crispa</i> (Forssk.) B. H.	-	-	V	-	Fl	Fr	-	-	-	Pr	-	-
120	<i>Raphanus sativus</i> L.	-	Fr	-	-	-	-	Pr	-	-	-	V	Fl
121	<i>Ranunculus muricatus</i> L.	-	-	V	-	Fl	Fr	-	-	-	Pr	-	-
122	<i>Reseda odorata</i> L.	-	Fr	-	-	-	-	Pr	-	-	-	V	Fl
123	<i>Rumex dentatus</i> L.	-	V	Fl	Fr	-	-	Pr	-	-	-	-	-
124	<i>Rumex hastatus</i>	-	V	Fl	Fr	-	-	Pr	-	-	-	-	-
125	<i>Saccharum munja</i> Roxb.	-	V	Fl	Fr	-	-	-	-	-	-	-	Pr
126	<i>Saccharum bengalense</i> Retz	-	V	-	Fl	-	Fr	-	-	-	Pr	-	-
127	<i>Salvia aegyptiaca</i> L.	-	-	V	Fl	-	Fr	-	Pr	-	-	-	V
128	<i>Saponaria vaccaria</i>	-	-	V	Fl	-	Fr	-	Pr	-	-	-	V
129	<i>Saussurea heteromalla</i> (D.	-	-	V	Fl	-	Fr	-	Pr	-	-	-	V

S. No	Species	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
	<i>Don.) Hand</i>												
130	<i>Setaria vercillata (L.)</i>	-	-	-	-	Fl	-	-	-	-	Pr	V	Fl
131	<i>Sisymbrium irio L.</i>	-	-	V	Fl	-	Fr	-	Pr	-	-	-	-
132	<i>Solanum melangena</i>	-	-	V	Fl	-	Fr	-	Pr	-	-	-	-
133	<i>Solanum surattense</i> Burm. f.	-	-	-	-	V	Fl	-	Fr	-	-	-	Pr
134	<i>Solanum tuberosum</i>	-	-	V	Fl	-	Fr	-	Pr	-	-	-	-
135	<i>Sonchus asper (L.) Hill</i>	-	-	Fl	Fr	-	-	Pr	-	-	-	-	V
136	<i>Sonchus oleraceus L.</i>	-	-	Fl	Fr	-	-	Pr	-	-	-	-	V
137	<i>Sorghum vulgare (L.) Pers.</i>	-	-	Fl	Fr	-	-	Pr	-	-	-	-	V
138	<i>Stellaria media L. Vill</i>	-	-	Fl	Fr	-	-	Pr	-	-	-	-	V
139	<i>Taraxacum officinale F.H. Wigg.</i>	-	-	Fl	Fr	-	-	Pr	-	-	-	-	-
	<i>Thymelaea passerine</i>												
140	<i>Torilis japonica (Houtt.) DC.</i>	-	-	V	Fl	Fr	-	Pr	-	-	-	-	-
141	<i>Trianthema portulacastrum L.</i>	-	-	V	-	Fl	Fr	-	-	-	Pr	-	-
142	<i>Tribulus terrestris L.</i>	-	-	-	-	V	Fl	-	Fr	-	-	-	Pr
143	<i>Trifolium alexandrianum L.</i>	-	-	-	Fl	Fr	Pr	-	-	-	V	-	-
144	<i>Trigonella mcisa</i>	-	-	V	Fl	Fr	-	Pr	-	-	-	-	-
145	<i>Triticum aestivum L.</i>	-	-	Fl	Fr	-	Pr	-	-	-	-	V	-
146	<i>Typhalatifolia L.</i>	-	-	V	-	Fl	-	-	Fr	-	-	-	Pr
147	<i>Typha minima Funck er Hoppe</i>	-	-	V	-	Fl	-	-	Fr	-	-	-	Pr
148	<i>Utrica pilulifera L.</i>	-	-	V	Fr	-	Pr	-	-	-	-	Pr	-
149	<i>Verbena hybrid</i>	-	V	Fl	Fr	-	-	Pr	-	-	-	-	-
150	<i>Verbena officinale</i>	-	V	Fl	Fr	-	-	Pr	-	-	-	-	-
151	<i>Veronica aqutica Bern.</i>	-	V	Fl	Fr	-	-	Pr	-	-	-	-	-
152	<i>Vicia sativa L.</i>	-	-	Fl	Fr	-	-	Pr	-	-	-	-	V
153	<i>Xanthium strumarium L.</i>	-	-	Fl	Fr	-	-	Pr	-	-	-	-	V
154	<i>Zea mays L.</i>	-	-	-	-	V	-	Fl	Fr	-	Pr	-	-
155	<i>Zelays petendra (L.) C. Jeffery</i>	-	-	-	-	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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