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FLORISTIC STUDIES OF ANGIOSPERMS OF RAWALAKOT AZAD JAMMU AND KASHMIR PAKISTAN

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ABSTRACT

Flora of Rawalakot is under immense pressure after earthquake 2005. The present study was conducted to provide a check list of angiosperms for plant conservation. A total of 381 species of angiosperms belonging to 78 families and 238 genera were recorded from Rawalakot. The dominant families were Asteraceae with 38 species, Poaceae with 37 species, Papilionaceae with 26 species, Rosaceae with 22 species, Lamiaceae with 20 species, Brassicaceae and Cyperaceae with 12 species each and Polygonaceae with 10 species. In this check list 61 species were designated as rare. Some of important species *Ulmus wallichiana*, *Melia azedarach*, *Celtis eriocarpa*, *Bauhinia variegata*, *Grewia eriocarpa*, *Populus alba*, *Acer caesium*, *Sapindus mukorossi*, *Albizia odoratissima*, *Debregeasia salicifolia*, *Hypericum oblongifolium*, *Zanthoxylum armatum*, *Astragalus psilocentros*, *Cydonia oblonga*, *Cotoneaster microphyllus*, *C.roseus*, *Buddleja asiatica*, *Calotropis procera* and *Vitex negundo* are very important from conservation point of view. This study also indicated that deforestation and poplar industry along habitat loss, over grazing, unawareness, annual fire practices and exploitation of medicinal plants were the major threats to the angiosperms of Rawalakot. It is now realized that strengthening of laws is an immediate need at local and national level for conservation of floral diversity.

Key words: Floristic, flora, Rawalakot, Himalaya, angiosperms.

INTRODUCTION

The diverse physiogeographical and climatic attributes of Himalaya make it emporium of biodiversity. Traditionally Himalayas have been variously divided by number of workers into Western Himalaya, Central Himalaya and Eastern Himalaya with varied climatic zones ranging from subtropical to alpine zone on the basis of elevation (Rana *et al*., 2010). Azad Kashmir located in the foothills of Western Himalaya with an area of 13,269 Km^2 can be divided into two distinct geographical zones; North and East are mostly hilly and mountainous while South and West are valleys and plains. Extensive topographical variations in the area support variety of plant species ranging from subtropical flora of plains and alpine flora of higher altitude (Afshan *et al*., 2011). The Western Himalaya is identified as global center of plant diversity and endemism. About 80 % of endemic taxa of Pakistan are confined to Northern and Western mountains and Kashmir (Ali, 2008). A few taxonomic studies were reported from study area. Stewart (1972) conducted vegetation surveys of Pakistan including Poonch district of Azad Kashmir and catalogued vascular plants of the area. Bhopal and Chaudhri (1977) revised flora of Pothohar and adjoining areas including Azad Kashmir. E. Nasir and S. I. Ali; S. I. Ali and Y. J. Nasir; S. I. Ali and M. Qaiser edited and published 215 volumes of Flora of Pakistan in which they described 4758 vascular plant species of Pakistan and Azad Kashmir (Ali, 2008). But these studies are outdated and need to be revised. Most of the studies from the study area are based on ethnobotanical surveys. Gorsi and Shahzad (2002) documented the ethno medicinal importance of plants from Dirkot district Poonch Azad Kashmir. Qureshi *et al.* (2007) reported 33 medicinal plants from Sudhan Gali and Ganga Chotti Hills, district Bagh, Azad Kashmir. Khan *et al.* (2010) conducted ethnobotanical studies of Poonch and reported 169 species. Shaheen *et al*. (2012) collected 71 herbs from alpine pastures of district Bagh Azad Kashmir and revealed that 45 herbs had medicinal value. There are several other ethnobotanical reports from the study area and its adjoining area (Khan, 1996; Sadiq, 1996; Shehzad *et al.*, 1999; Dastagir, 2001; Shehzad and Qureshi, 2001; Ishtiaq *et al.*, 2006; Khan, *et al.*, 2012; Shaukat *et al.*, 2012 and Bano *et al.*, 2013). Although area is floristically rich and has number of host plants (Afshan *et al*., 2011). Many of the areas are still underexplored taxonomically. Rawalakot is one of those areas which are also underexplored taxonomically and ethno-botanically. To fill this lacuna, a detailed botanical exploration was undertaken during 2009-2012.

MATERIALS AND METHODS

Study Area: Rawalakot (33º 51´ N, 73º 45´ E) is one of the tehsil of district Poonch of Azad Kashmir (Fig. 01). It occupies an area of about 382 Km^2 at the elevation ranges

of 1067 m to 2652 m above the sea level. Indian occupied Kashmir lies to the East, Rawalpindi district to the West, district Hawaili to the East-North, district Bagh to the North and district Sudnuti lies to the South of Rawalakot. The study area is hilly and mountainous. Average rain fall is about 55.08 inches and average maximum temperature of summer is about 27-29ºC. January and February are the coldest months of the year with average minimum temperature 3ºC. The climate of the area is subtropical humid to humid temperate type. Subtropical areas are dominated by *Pinus roxburghii*, *Olea ferruginea*, *Dodonaea viscosa*, *Justicia adhatoda* and *Punica granatum* and temperate areas are dominated by *Pinus wallichiana*, *Populus ciliata*, *Robinia pseudo-acacia*, *Berberis lycium* and *Elaeagnus umbellata*. Due to cool and humid conditions for most of year, the vegetation in the area comprises a wide diversity of angiosperms.

Data Collection: The study was conducted during 2009-2012; different localities of Rawalakot were frequently visited for plant collection.

Abundance: The abundance of each species was recorded on the basis of population size during field surveys and given the status as 'D' (a species dominates the area), 'A' (a species very common in several areas with large population), 'F' (a species with small population in several areas), 'O' (a species with very small population in few areas) and 'R' (a species with few individuals in one area or few areas).

Identification: The collected specimens were dried, identified and preserved by using standard herbarium techniques. Identification of plants was done by comparing with authorized herbarium specimens at Quaid-e-Azam University Islamabad; by comparing with taxonomic keys with Flora of Pakistan (Nasir and Ali, 1970-1979; Nasir and Ali, 1980-1989; Ali and Nasir, 1989-1992; Ali and Qaiser, 1993-1995; Ali and Qaiser, 2000-2008). All the specimens were deposited in the herbarium of Department of Botany Azad Kashmir University (HAJKU) Muzaffarabad.

RESULTS

The floristic of angiosperm flora of Rawalakot was represented by 381 species belonging to 238 genera and 78 families (Table 01) of which 306 were dicots and 75 were monocots. The dominant families were Asteraceae with 38 species and Poaceae with 37 species followed by Papilionaceae with 26 species, Rosaceae with 22 species, Labiatae with 20 species, Brassicaceae and Cyperaceae with 12 species each and Polygonaceae with 10 species (Figure 04). These eight families constitute about 46% of entire angiospermic flora of Rawalakot. Life form comprised of 273 (71.9 %) herbs' 45 (11.81%) shrubs, 44 (11.54%) trees, 12 (3.14%) subshrubs and 07 (1.83%) lianas (fig.02). In the study area woody flora was represented by 89 species (45 shrubs and 44 trees). The abundance category of flora of Rawalakot showed that there were 34 (8.92 %) dominant species, 94 (24.93 %) abundant, 83 (21.52 %) frequent, 109 (28.70 %) occasional, and 61 (16.27%) rare species (fig. 03).

Table 01. Table showing floristic of angiosperms of Rawalakot with Habit, Flowering period, Abundance and voucher number, species are arranged alphabetically.

	Species	Family	Habit	Flowering period	Ab	V. #
	Dicots					
1.	*Acacia modesta* Wall.	Mimosaceae	Tree	April-May	O	822
2.	*Acer caesium* Wall. ex Brandis	Aceraceae	Tree	May-June	R	1132
3.	*Achillea millefolium* L.	Asteraceae	PH	June-October	O	1177
4.	*Achyranthes aspera* L.	Amaranthaceae	PH	June-September	F	688
5.	*A. bidentata* Blume	Amaranthaceae	PH	June-September	F	992
6.	*Aeschynomene indica* L.	Papilionaceae	SS	August-September	F	332
7.	*Aesculus indica* Wall ex Camb.	Hippocastanaceae	Tree	April-May	D	1070
8.	*Ailanthus excelsa* Roxb.	Simaroubaceae	Tree	March-April	A	475
9.	*Ajuga bracteosa* Wall. ex Benth.	Lamiaceae	AH	April-October	A	974
10.	*Albizia odoratissima* (L.f.) Benth.	Mimosaceae	Tree	April-May	R	1314
11.	*Alcea rosea* L.	Malvaceae	AH	July- September	O	236
12.	*Alternanthera pungens* Kunth	Amaranthaceae	PH	May-September	F	527
13.	*Amaranthus hybridus* L.	Amaranthaceae	AH	May-September	O	526
14.	*A. lividus* L.	Amaranthaceae	AH	May-September	F	724
15.	*A. viridus* L.	Amaranthaceae	AH	May-September	F	1532
16.	*Anagallis arvensis* L.	Primulaceae	AH	June-August	O	1531
17.	*Anaphalis kashmiriana* P.C. Pant. Rao and Garg.	Asteraceae	PH	May-June	A	1400
18.	*A. triplinervis* (Sims) Sims ex C.B. Clarke.	Asteraceae	PH	June-July	O	339
19.	*A. virgata* Thomson ex C.B. Clarke.	Asteraceae	PH	May-June	O	765

20.	*Androsace rotundifolia* Hardw.	Primulaceae	PH	May-September	O	99
21.	*Arabidopsis wallichii* (Hook.f. and Thomson) N. Bush	Brassicaceae	AH	April-June	R	437
22.	*Aristolochia punjabensis* Lace	Aritolochiaceae	SS	July	R	412
23.	*Artemisia amygdalina* Decne.	Asteraceae	PH	May-August	O	1534
24.	*A. indica* Willd.	Asteraceae	PH	May-August	F	1636
25.	*A. scoparia* Waldst. and Kitam.	Asteraceae	PH	May-August	O	1099
26.	*A. vestita* Wall.ex Bess.	Asteraceae	PH	May-August	O	316
27.	*A. vulgaris* L.	Asteraceae	PH	May-August	O	493
28.	*Astragalus amherstianus* Benth.	Papilionaceae	PH	April-May	R	731
29.	*A. psilocentros* Fisch.	Papilionaceae	Shrub	April-May	R	1165
30.	*Barleria cristata* L.	Acanthaceae	Shrub	June-September	R	1712
31.	*Bauhinia variegata* L.	Caesalpiniaceae	Tree	May	R	1263
32.	*Berberis lycium* Royle	Berberidaceae	Shrub	April-May	F	251
33.	*Bergenia ciliata* Sternb.	Saxifragaceae	PH	April-May	R	1127
34.	*B. stracheyi* (Hook. f. and Thomson) Engl.	Saxifragaceae	PH	April-May	R	289
35.	*Bidens pilosa* L.	Asteraceae	PH	May-August	D	496
36.	*Boerhavia procumbens* Banks ex. Roxb.	Nyctaginaceae	PH	August-September	O	529
37.	*Brassica napus* L.	Brassicaceae	AH	April-June	A	1355
38.	*B. rapa* subsp. *campestris* (L.) Clapham	Brassicaceae	AH	April-June	A	824
39.	*Broussonetia papyrifera* (L.) L'Hér. ex Vent.	Moraceae	Tree	April-June	O	707
40.	*Buddleja asiatica* Lour.	Buddlejaceae	Shrub	March-June	R	860
41.	*Bupleurum lanceolatum* Wall. ex DC.	Apiaceae	PH	June-July	O	429
42.	*Calamintha debilis* (Bunge) Benth.	Lamiaceae	AH	May-August	A	975
43.	*Calotropis procera* (Aiton) Dryand.	Asclepiadaceae	Shrub	August-September	R	1107
44.	*Cannabis sativa* L.	Cannabaceae	AH	July-September	D	1995
45.	*Capsella bursa-pastoris* (L.) Medik.	Brassicaceae	AH	April-June	A	359
46.	*Capsicum annuum* L.	Solanaceae	AH	July-August	A	1306
47.	*C. frutescens* L.	Solanaceae	AH	July-August	A	318
48.	*Carpesium cernuum* L.	Asteraceae	PH	May-August	A	1536
49.	*Cedrela serrata* Royle	Meliaceae	Tree	April-July	O	213
50.	*Celtis eriocarpa* Decne.	Ulmaceae	Tree	February-March	R	1240
51.	*Centaurea cyanus* L.	Asteraceae	AH	April-May	D	1209
52.	*C. iberica* Trevir.	Asteraceae	AH	April-May	D	1544
53.	*Cerastium dahuricum* Fisch.	Caryophyllaceae	PH	May-August	F	1726
54.	*C. dichotomum* L.	Caryophyllaceae	PH	May-August	F	540
55.	*C. fontanum* Baumg	Caryophyllaceae	PH	May-August	F	1676
56.	*C. glomeratum* Thuill.	Caryophyllaceae	AH	May-August	F	937
57.	*Chenopodium album* L.	Chenopodiaceae	AH	July-September	F	533
58.	*C. botrys* L.	Chenopodiaceae	AH	July-September	O	222
59.	*Cichorium intybus* L.	Asteraceae	PH	June-August	O	673
60.	*Cirsium falconeri* (Hook.f.)Petr.	Asteraceae	PH	June-September	A	767
61.	*Citrullus lanatus* (Thunb.) Matsum. and Nakai	Cucurbitaceae	AH	August-September	A	1828
62.	*Clematis gouriana* Roxb. ex DC.	Ranunculaceae	Liana	August-September	F	1238
63.	*C. montana* buch. –Ham. ex DC.	Ranunculaceae	Liana	June-July	O	455
64.	*Clinopodium umbrosum* (M. Bieb.) Kuntze	Lamiaceae	AH	May-August	O	1395
65.	*Colebrookea oppositifolia* Sm.	Lamiaceae	Shrub	Feburary-May	F	1035
66.	*Convolvulus arvensis* L.	Convolvulaceae	PH	June-August	A	233
67.	*Conyza bonariensis* (L.) Cronquist	Asteraceae	PH	April-October	D	691
68.	*C. canadensis* (L.) Cronquist	Asteraceae	AH	April-August	F	672
69.	*C. japonica* (Thunb.)Less. ex DC.	Asteraceae	AH	April-August	A	1955
70.	*Coriandrum sativum* L.	Apiaceae	AH	May-June	A	1562
71.	*Coronopus didymus* (L.) Sm.	Brassicaceae	AH	April-June	A	783
72.	*Cortusa brotheri* Pax ex Lipsky	Primulaceae	PH	July-August	O	266
73.	*Cotoneaster microphyllus* Wall. ex Lind.	Rosaceae	Shrub	July	R	1358
74.	*C. roseus* Edgew.	Rosaceae	Shrub	April-May	R	372
75.	*Crotalaria medicaginea* var. *luxurians* (Benth.) Baker	Papilionaceae	PH	June-August	R	727
	C. medicaginea var. *medicaginea* Lam.	Papilionaceae	PH	June-August	O	281
76.	*Cucubalus baccifer* L.	Caryophyllaceae	PH	June-July	R	532
77.	*Cucumis sativus* L.	Cucurbitaceae	AH	August-September	A	1868
78.	*Cuscuta reflexa* Roxb.	Cuscutaceae	AH	July-September	D	230
79.	*Cydonia oblonga* Mill.	Rosaceae	Shrub	April	R	322

80.	*Cynoglossum glochidiatum* Wall. ex Benth.	Boraginaceae	BH	July-August	O	1299
81.	*C. lanceolatum* Forssk.	Boraginaceae	PH	July-August	A	410
82.	*Dalbergia sissoo* Roxb. ex DC.	Papilionaceae	Tree	April-May	D	1256
83.	*Datura stramonium* L.	Solanaceae	AH	July-October	O	859
84.	*Daucus carota* L.	Apiaceae	BH	July-August	A	1309
85.	*Debregeasia salicifolia* (D.Don) Rendle	Urticaceae	Shrub	April-May	R	1050
86.	*Desmodium elegans* DC.	Papilionaceae	Shrub	May-September	A	280
87.	*D. laxiflorum* DC.	Papilionaceae	SS	May-September	A	284
88.	*Dicliptera bupleuroides* Nees	Acanthaceae	AH	June-September	F	1291
89.	*Diospyros kaki* Thunb.	Ebenaceae	Shrub	June-July	R	722
90.	*D. lotus* L.	Ebenaceae	Tree	June-July	F	721
91.	*Dodonaea viscosa* Jacq.	Sapindaceae	Shrub	April-May	D	881
92.	*Duchesnea indica* (Andrews) Focke	Rosaceae	PH	April-September	O	726
93.	*Echinops echinatus* Roxb. Hort.	Asteraceae	AH	June-September	A	1628
94.	*Elaeagnus angustifolia* L.	Elaeagnaceae	Shrub	May-June	O	686
95.	*E. umbellata* Thunb.	Elaeagnaceae	Shrub	May-June	D	1074
96.	*Erigeron annuus* (L.) Pers.	Asteraceae	AH	June-August	A	1854
97.	*E. multiradiatus* (Lindl. ex DC.) Benth. ex C.B. Clarke	Asteraceae	PH	June-August	A	663
98.	*Eruca sativa* Mill.	Brassicaceae	AH	April-June	A	1524
99.	*Euphorbia helioscopia* L.	Euphorbiaceae	AH	July-August	O	466
100.	*E. hirta* L.	Euphorbiaceae	AH	May-October	A	1160
101.	*E. prostrata* Aiton	Euphorbiaceae	AH	May-October	A	923
102.	*Ficus carica* L.	Moraceae	Tree	April-September	R	795
103.	*F. johannis* Boiss.	Moraceae	Shrub	April-September	R	1983
104.	*F. palmata* Forssk.	Moraceae	Tree	April-September	F	1684
105.	*Foeniculum vulgare* Mill.	Apiaceae	PH	April-September	R	827
106.	*Fragaria nubicola* (Hook.f.) Lindl. Ex Lacaita	Rosaceae	PH	April-May	A	1222
107.	*F. vesca* L.	Rosaceae	PH	April-May	O	432
108.	*Galium aparine* L.	Rubiaceae	AH	April-July	F	704
109.	*G. asperuloides*	Rubiaceae	AH	April-July	A	222
110.	*Gentiana capitata* Buchanan-Hamilton ex D. Don, Prodr.	Gentianaceae	AH	March-april	O	1020
111.	*G. prostrata* Haenke	Gentianaceae	AH	March-april	O	725
112.	*Geranium collinum* Stephan ex Willd.	Geraniaceae	PH	May-August	O	1258
113.	*G. lucidum* L.	Geraniaceae	AH	May-August	F	505
114.	*G. ocellatum* Cambess	Geraniaceae	AH	May-August	O	358
115.	*G. rotundifolium* L.	Geraniaceae	AH	May-August	O	906
116.	*G. rubifolium* Lindl.	Geraniaceae	PH	May-August	O	457
117.	*Gerbera gossypina* (Royle) Beauvered	Asteraceae	PH	June-July	R	1398
118.	*Gnaphalium affine* D.Don	Asteraceae	AH	April-May	O	208
119.	*Grewia eriocarpa* Juss.	Tiliaceae	Tree	March-April	R	1265
120.	*Hedera nepalensis* K.Koch.	Araliaceae	Liana	September-October	O	1665
121.	*Helianthus annuus* L.	Asteraceae	AH	August-September	O	995
122.	*H. tuberosus* L.	Asteraceae	PH	August-September	O	1624
123.	*Hibiscus rosa-sinensis* L.	Malvaceae	Shrub	July- September	O	1136
124.	*Hypericum oblongifolium* Choisy	Guttiferae	Shrub	April-August	R	780
125.	*H. perforatum* L.	Guttiferae	PH	June-August	R	832
126.	*Impatiens balsamina* L.	Balsaminaceae	AH	July-August	A	474
127.	*I. brachycentra* Kar. and Kir.	Balsaminaceae	AH	July-August	F	1570
128.	*I. edgeworthii* Hook. f.	Balsaminaceae	AH	July-August	A	1349
129.	*I. scabrida* DC.	Balsaminaceae	AH	July-August	A	709
130.	*Indigofera heterantha* Wall. ex Brandis	Papilionaceae	Shrub	May-September	A	525
131.	*I. trifoliata* L.	Papilionaceae	SS	May-September	O	376
132.	*Ipomoea eriocarpa* R.Br.	Convolvulaceae	AH	August-September	A	1162
133.	*I. hederacea* Jacq.	Convolvulaceae	AH	August-September	A	1016
134.	*I. purpurea* (L.) Roth.	Convolvulaceae	AH	August-September	A	773
135.	*Jasminum humile* L.	Oleaceae	Shrub	May-June	F	1645
136.	*J. officinale* L.	Oleaceae	Shrub	May-June	A	423
137.	*Juglans regia* L.	Juglandaceae	Tree	April-May	O	1083
138.	*Justicia adhatoda* L.	Acanthaceae	Shrub	July-September	F	220
139.	*J. japonica* Thunb.	Acanthaceae	PH	July-September	A	1711

140.	*Lagenaria siceraria* (Molina) Standl.	Cucurbitaceae	AH	August-September	A	575
141.	*Lamium album* L.	Lamiaceae	PH	June-July	D	968
142.	*Lantana camara* L.	Verbenaceae	Shrub	May-October	A	1751
143.	*Lathyrus aphaca* L.	Papilionaceae	AH	May-June	O	275
144.	*L. odoratus* L.	Papilionaceae	AH	May-June	R	1511
145.	*Leonurus cardiaca* L.	Lamiaceae	PH	June-July	A	519
146.	*Lepidium perfoliatum* L.	Brassicaceae	AH	April-June	F	506
147.	*L. pinnatifidum* Ledeb.	Brassicaceae	AH	April-June	A	483
148.	*L. virginicum* L.	Brassicaceae	AH	April-June	A	1303
149.	*Lespedeza juncea* (L.f.) Pers.	Papilionaceae	Shrub	August-September	A	235
150.	*Leucas cephalotes* (Roth) Spreng.	Lamiaceae	AH	July-September	A	762
151.	*L. mollissima* Wall. ex Benth.	Lamiaceae	PH	July-September	A	761
152.	*Lonicera quinquelocularis* Hard.	Caprifoliaceae	Shrub	April-June	F	1200
153.	*Lotus corniculatus* L.	Papilionaceae	PH	April	A	333
154.	*L. schimperi* Steud.	Papilionaceae	PH	April	A	778
155.	*Luffa cylindrica* (L.)M. Roem.	Cucurbitaceae	AH	August-September	A	935
156.	*Lycopersicon esculentum* Mill.	Solanaceae	AH	July-August	F	320
157.	*Lysimachia japonica* Thunb.	Primulaceae	PH	July-August	F	390
158.	*L. prolifera* Klatt	Primulaceae	AH	July-August	F	1328
159.	*Mallotus philippensis* (Lam.) Müll. Arg.	Euphorbiaceae	Shrub	March-September	O	920
160.	*Malus baccata* (L.) Borkh.	Rosaceae	Tree	April	R	1513
161.	*M. pumila* Mill.	Rosaceae	Tree	April	A	871
162.	*Malvastrum coromandelianum* (L.) Grarcke.	Malvaceae	SS	July- September	O	1216
163.	*Medicago falcata* L.	Papilionaceae	PH	May-June	O	374
164.	*M. minima* (L.) L.	Papilionaceae	AH	May-June	A	873
165.	*M. polymorpha* L.	Papilionaceae	AH	May-June	O	329
166.	*Melia azedarach* L.	Meliaceae	Tree	March-April	R	473
167.	*Melilotus indica* (L.) All.	Papilionaceae	AH	May-August	A	729
168.	*Mentha arvesis* L.	Lamiaceae	PH	April-October	D	583
169.	*M. longifolia* (L.) L.	Lamiaceae	PH	April-October	D	218
170.	*M. spicata* L.	Lamiaceae	PH	April-October	A	1595
171.	*Micromeria biflora* (Buch.-Ham. ex D.Don) Benth.	Lamiaceae	SS	May-October	F	1396
172.	*Mirabilis jalapa* L.	Nyctaginaceae	PH	September-October	O	934
173.	*Momordica dioica* Roxb. ex Willd.	Cucurbitaceae	AH	August-September	A	631
174.	*Morus alba* L.	Moraceae	Tree	April-May	O	669
175.	*M. nigra* L.	Moraceae	Tree	April-May	O	847
176.	*Myriactis nepalensis* Lees.	Asteraceae	PH	June-August	A	1097
177.	*M. africana* L.	Myrsinaceae	Shrub	May-June	O	982
178.	*Nasturtium officinale* W.T.Aiton	Brassicaceae	PH	May-August	D	830
179.	*Nepeta erecta* (Royle ex. Benth.) Benth.	Lamiaceae	PH	June-September	O	763
180.	*Nerium oleander* L.	Apocynaceae	Shrub	May-August	F	415
181.	*Oenothera rosea* L'Hér. ex Aiton	Onagraceae	PH	May-August	O	271
182.	*Olea ferruginea* Wall. ex Aitch.	Oleaceae	Tree	April-May	D	865
183.	*Origanum vulgare* L.	Lamiaceae	PH	May-September	A	585
184.	*Otostegia limbata* (Benth.) Boiss.	Lamiaceae	Shrub	May-June	A	966
185.	*Oxalis corniculata* L.	Oxalidaceae	AH	March-April	O	356
186.	*Oxytropis mollis* Royle ex Benth.	Papilionaceae	PH	May-August	R	325
187.	*Parthenium hysterophorus* L.	Asteraceae	AH	April-October	D	303
188.	*Persicaria amplexicaulis* D.Don	Polygonaceae	PH	May-September	F	787
189.	*P. hydropiper* (L.) Delarbre	Polygonaceae	AH	May-September	F	576
190.	*P. lapathifolia* (L.) Delarbr	Polygonaceae	AH	May-September	F	984
191.	*P. maculosa* Gray	Polygonaceae	AH	May-September	F	1574
192.	*P. nepalensis* (Meisn) H. Gross	Polygonaceae	PH	May-September	F	1679
193.	*Phlomis bracteosa* Royle ex Benth.	Lamiaceae	PH	June-September	R	210
194.	*P. spectabilis* Falc. ex Benth.	Lamiaceae	PH	June-September	O	759
195.	*Pimpinella acuminata* (Edgew.) C.B. Clarke	Apiaceae	PH	May-June	O	1321
196.	*P. diversifolia* DC.	Apiaceae	AH	May-June	A	484
197.	*Plantago lanceolata* L.	Plantaginaceae	PH	June-September	F	408
198.	*P. major* L.	Plantaginaceae	PH	June-September	F	1298
199.	*Plectranthus barbatus* Andrews	Lamiaceae	PH	June-August	A	1599
200.	*Podophyllum emodi* Wall. ex Hook. F. and Thomson	Berberidaceae	PH	May-June	R	1037
201.	*Polygonum aviculare* L.	Polygonaceae	AH	May-September	O	792

202.	*P. plebejum* R.Br., Prodr.	Polygonaceae	AH	May-September	O	389
203.	*Populus alba* L.	Salicaceae	Tree	April-May	R	1230
204.	*P. ciliata* Wall. ex Royle	Salicaceae	Tree	April-May	D	1526
205.	*P. nigra* L.	Salicaceae	Tree	April-May	A	1223
206.	*Potentilla atrosanguinea* Lodd., G. Lodd. and W. Lodd.	Rosaceae	PH	April-August	O	1270
207.	*P. reptans* L.	Rosaceae	PH	April-June	O	378
208.	*Prenanthes alba* L.	Asteraceae	PH	June-August	D	1181
209.	*P. altissima* L.	Asteraceae	PH	June-July	O	1635
210.	*Prunella vulgaris* L.	Lamiaceae	PH	July-September	F	1030
211.	*Prunus armeniaca* L.	Rosaceae	Tree	April	A	321
212.	*P. domestica* L.	Rosaceae	Tree	April	A	1561
213.	*P. persica* (L.) Stokes	Rosaceae	Tree	April	A	816
214.	*Punica granatum* L.	Punicaceae	Shrub	April-May	F	733
215.	*Pyrus communis* L.	Rosaceae	Tree	April	A	322
216.	*P. pashia* Buch.-Ham. ex D.Don.	Rosaceae	Tree	April	A	331
217.	*P. pyrifolia* (Burm. F.) Nakai	Rosaceae	Tree	April	R	377
218.	*Quercus baloot* Griff	Fagaceae	Tree	April-May	F	187
219.	*Q. dilatata* Royle	Fagaceae	Tree	April-May	O	237
220.	*Q. glauca* Thunb.	Fagaceae	Tree	April-May	O	995
221.	*Q. incana* W. Bartram	Fagaceae	Tree	April-May	O	718
222.	*Q. semecarpifolia* Sm.	Fagaceae	Tree	April-May	O	260
223.	*Ranunculus arvensis* L.	Ranunculaceae	AH	March-April	O	1337
224.	*R. hirtellus* Royle	Ranunculaceae	PH	June-July	O	253
225.	*R. laetus* Wall. ex Hook. f. and J. W. Thomson	Ranunculaceae	PH	March-April	O	297
226.	*R. muricatus* L.	Ranunculaceae	AH	March-April	F	352
227.	*Raphanus raphanistrum* L.	Brassicaceae	AH	April-June	A	326
228.	*R. sativus* L.	Brassicaceae	AH	April-June	A	1219
229.	*Rhamnus purpurea* Edgew.	Rhamnaceae	Tree	May-June	O	469
230.	*Ricinus communis* L.	Euphorbiaceae	Shrub	May-September	F	1351
231.	*Robinia pseudo-acacia* L.	Papilionaceae	Tree	April-May	D	1616
232.	*Rosa brunonii* Lindl.	Rosaceae	Shrub	March-September	O	821
233.	*R. chinensis* Jacq.	Rosaceae	Shrub	March-September	A	1359
234.	*Rubia cordifolia* L.	Rubiaceae	AH	May-July	O	1744
235.	*R. himalayensis* Klotzsch in Klotzsch and Garcke	Rubiaceae	AH	May-July	O	223
236.	*Rubus fruticosus* L.	Rosaceae	Shrub	May-June	R	777
237.	*R. ellipticus* Sm.	Rosaceae	Shrub	May-June	A	426
238.	*R. niveus* Thunb.	Rosaceae	Shrub	May-June	F	823
239.	*R. ulmifolius* Schott.	Rosaceae	Shrub	May-June	F	1799
240.	*Rumex acetosa* L.	Polygonaceae	PH	May-September	O	1336
241.	*R. hastatus* D.Don	Polygonaceae	SS	May-September	O	560
242.	*R. nepalensis* Spreng.	Polygonaceae	AH	May-September	O	1782
243.	*Sagina saginoides* (L.) H. Karst.	Caryophyllaceae	PH	June-July	F	1724
244.	*Salix alba* L.	Salicaceae	Tree	April-May	D	488
245.	*S. babylonica* L.	Salicaceae	Tree	April-May	O	535
246.	*S. caprea* L.	Salicaceae	Tree	April-May	O	367
247.	*S. denticulata* Andersson	Salicaceae	Tree	April-May	O	434
248.	*Sanicula elata* Buch.-Ham. ex D.Don	Apiaceae	BH	June-July	O	482
249.	*Sapindus mukorossi* Gaertn.	Sapindaceae	Tree	June-July	R	925
250.	*Sarcococca saligna* (D.Don) Müll . Arg.	Buxaceae	Shrub	Feburary-March	F	875
251.	*Saussurea heteromalla* (D.Don) Hand.-Mazz.	Asteraceae	AH	May-August	O	209
252.	*Scandix pecten-veneris* L.	Apiaceae	AH	April-May	O	382
253.	*Schefflera bengalensis* Gamble	Araliaceae	Liana	September-October	O	1667
254.	*Scrophulaira nodosa* L.	Scrophulariaceae	PH	May-June	O	278
255.	*S. lanceolata* Pursh.	Scrophulariaceae	PH	May-June	O	774
256.	*Scutellaria prostrata* Jacq. ex Benth.	Lamiaceae	SS	June-September	O	1213
257.	*Senecio nudicaulis* Buch. –Ham. exD.Don	Asteraceae	PH	June-August	A	1898
258.	*Silene conoidea* L.	Caryophyllaceae	AH	May-June	F	1818
259.	*Sisymbrium irio* L.	Brassicaceae	AH	April-June	O	1518
260.	*Solanum melongena* L.	Solanaceae	PH	July-August	A	1794
261.	*S. nigrum* L.	Solanaceae	AH	April-September	R	1010
262.	*S. surattense* Burm. f.	Solanaceae	AH	April-September	R	226

263.	*S. tuberosum* L.	Solanaceae	PH	July-August	A	1012
264.	*Solena amplexicaulis* (Lam.) Gandhi	Cucurbitaceae	AH	August-September	A	580
265.	*Sonchus arvensis* L.	Asteraceae	PH	April-August	A	1717
266.	*S. asper* (L.) Hill	Asteraceae	AH	April-August	O	224
267.	*S. oleraceus* L.	Asteraceae	AH	April-August	O	708
268.	*Strobilanthes urticifolia* Wall. ex Kuntze	Acanthaceae	SS	June-September	D	416
269.	*S. wallichii* Nees	Acanthaceae	PH	June-September	A	219
270.	*Swertia alata* C.B. Clarke	Gentianaceae	AH	April-May	R	1021
271.	*Tagetes minuta* L.	Asteraceae	AH	August-September	D	1893
272.	*Taraxacum officinale* Webb.	Asteraceae	PH	March-April	F	1703
273.	*Thalictrum minus* L.	Ranunculaceae	PH	July-August	R	1238
274.	*Trichodesma indicum* (L.) Lehm.	Boraginaceae	PH	July-August	R	714
275.	*Trifolium dubium* Sibth.	Papilionaceae	AH	May	O	667
276.	*T. repens* L.	Papilionaceae	PH	May	D	719
277.	*Trigonella fimbriata* Royle ex Benth.	Papilionaceae	AH	May	F	237
278.	*Ulmus villosa* Brandis ex Gamble	Ulmaceae	Tree	February-March	O	1138
279.	*U. wallichiana* Planch.	Ulmaceae	Tree	February-March	R	259
280.	*Urtica ardens* Link	Urticaceae	AH	May-August	R	202
281.	*U. dioica* L.	Urticaceae	AH	May-June	R	801
282.	*Valeriana jatamansi* Jones	Valerianaceae	PH	March-June	F	1757
283.	*V. officinalis* L.	Valerianaceae	PH	March-April	D	1758
284.	*V. pyrolifolia* Decne.	Valerianaceae	PH	March-April	A	863
285.	*Verbascum thapsus* L.	Scrophulariaceae	AH	July-August	R	1793
286.	*Verbena officinalis* L.	Verbenaceae	PH	April-August	O	1105
287.	*V. tenuisecta* Briq.	Verbenaceae	PH	March-April	D	414
288.	*Veronica arvensis* L.	Scrophulariaceae	AH	April-May	D	1593
289.	*V. hederifolia* L.	Scrophulariaceae	AH	April-May	A	867
290.	*V. melissifolia* Desf. ex Poir.	Scrophulariaceae	PH	May-June	A	815
291.	*V. persica* Poir.	Scrophulariaceae	AH	April-May	A	1117
292.	*Viburnum cotinifolium* D.Don.	Caprifoliaceae	Shrub	Feburary-March	F	1760
293.	*V. grandiflorum* Wall. ex DC.	Caprifoliaceae	Shrub	Feburary-March	A	421
294.	*Vicia monantha* Retz.	Papilionaceae	AH	May-June	O	732
295.	*V. sativa* L.	Papilionaceae	AH	May-June	A	779
296.	*Viola odorata* L.	Violaceae	PH	March-April	A	381
297.	*Vitex negundo* L.	Verbenaceae	Shrub	May-June	R	717
298.	*Vitis jacquemontii* R. Parker	Vitaceae	Liana	May-June	O	1654
299.	*V. vinifera* L.	Vitaceae	Liana	May-June	O	470
300.	*Withania somnifera* (L.) Dunal	Solanaceae	SS	July-August	O	228
301.	*Xanthium strumarium* L.	Asteraceae	SS	April-July	D	446
302.	*Youngia japonica* (L.) DC.	Asteraceae	AH	April-June	R	1397
303.	*Zanthoxylum armatum* DC.	Rutaceae	Shrub	April-May	R	465
304.	*Ziziphus jujuba* Mill.	Rhamnaceae	Shrub	June-July	A	921
305.	*Z. nummularia* (Burm.f.) Wight and Arn.	Rhamnaceae	Shrub	April-June	O	519
306.	*Z. spina-christi* (L.) Desf.	Rhamnaceae	Shrub	June-July	O	1613
		Monocots				
307.	*Acorus calamus* L.	Araceae	PH	July-August	O	509
308.	*Agave americana* L.	Asparagaceae	PH	Not seen	R	1989
309.	*Agrostis stolonifera* L.	Poaceae	PH	July-August	F	374
310.	*Allium cepa* L.	Amaryllidaceae	PH	July-September	A	656
311.	*A. sativum* L.	Amaryllidaceae	PH	July-September	A	606
312.	*Apluda mutica* L.	Poaceae	PH	July-August	O	363
313.	*Arisaema flavum* (Forssk.) Schott	Araceae	PH	July-August	D	1908
314.	*A. jacquemontii* Blume	Araceae	PH	July-August	A	962
315.	*Aristida cyanantha* Steud.	Poaceae	PH	July-August	F	345
316.	*Arthraxon lancifolius* (Trin.) Hochst.	Poaceae	AH	August-September	R	348
317.	*A.prionodes* (Steud.) Dandy	Poaceae	PH	August-September	R	352
318.	*Arum jacquemontii* Blume	Araceae	PH	July-August	O	1907
319.	*Arundo donax* L.	Poaceae	PH	July-August	O	327
320.	*Asparagus racemosus* Willd.	Asparagaceae	SS	July-August	R	610
321.	*Brachiaria distachya* (L.) Stapf	Poaceae	AH	June-August	F	384
322.	*Brachypodium distachyon* (L.) P. Beauv.	Poaceae	AH	June-August	F	344
323.	*B. sylvaticum* (Huds.)P.Beauv.	Poaceae	PH	June-July	F	298

324.	*Bromus japonicus* Thunb.	Poaceae	AH	June-July	A	372
325.	*B. oxyodon* Schrenk	Poaceae	AH	June-July	A	374
326.	*B. pectinatus* Thunb.	Poaceae	AH	July-August	A	373
327.	*Carex brunnea* Thunb.	Cyperaceae	PH	May-August	F	254
328.	*C. cruciata* Wahlenb.	Cyperaceae	PH	May-August	F	1640
329.	*C. decaulescence* V.I.Krecz.	Cyperaceae	PH	May-August	F	852
330.	*C. filicina* Nees	Cyperaceae	PH	May-August	F	798
331.	*Chrysopogon gryllus* (L.) Trin.	Poaceae	PH	July-August	F	380
332.	*Colchicum luteum* Baker	Colchicaceae	PH	Feburary	F	1852
333.	*Commelina benghalensis* L.	Commelinaceae	PH	July-August	D	1585
334.	*Cynodon dactylon* (L.) Pers.	Poaceae	PH	April-October	D	321
335.	*Cyperus cyperoides* (L.) Kuntze	Cyperaceae	PH	May-August	F	553
336.	*C. esculentus* L.	Cyperaceae	PH	May-August	F	955
337.	*C. iria* L.	Cyperaceae	AH	May-August	F	851
338.	*C. niveus* Retz.	Cyperaceae	PH	May-August	F	504
339.	*C. rotundus* L.	Cyperaceae	PH	May-August	F	603
340.	*Dichanthium annulatum* (Forssk.) Stapf	Poaceae	PH	July-August	A	315
341.	*Digitaria ciliaris* (Retz.) Koeler	Poaceae	AH	July-August	A	303
342.	*D. sanguinalis* (L.) Scop.	Poaceae	AH	July-August	F	304
343.	*Echinochloa crus-galli* (L.) P. Beauv	Poaceae	AH	June-August	F	300
344.	*Eleusine indica* (L.) Gaertn.	Poaceae	AH	April-June	F	316
345.	*Eragrostis cilianensis* (All.) Janch.	Poaceae	AH	May-September	O	346
346.	*E. minor* Host	Poaceae	AH	May-September	F	347
347.	*Erioscirpus comosus* (Nees) Palla	Cyperaceae	PH	May-August	F	255
348.	*Fuirena pubescens* (Poir.) Kunth	Cyperaceae	PH	May-August	F	454
349.	*Gagea elegans* Wall. ex G.Don	Liliaceae	AH	April-May	F	217
350.	*Habenaria digitata* Lindl.	Orchidaceae	PH	July-August	R	256
351.	*H. intermedia* D.Don, Prodr.	Orchidaceae	PH	July-August	R	1901
352.	*Helictotrichon junghuhnii* (Buse)Henrard	Poaceae	PH	July-August	O	314
353.	*Imperata cylindrica* (L.) Raeusch.	Poaceae	PH	May-August	F	367
354.	*Iris kashmiriana* Baker	Iridaceae	PH	May-June	A	510
355.	*Juncus articulatus* L.	Juncaceae	PH	July-September	O	554
356.	*J. inflexus* L.	Juncaceae	PH	July-September	O	1801
357.	*Lolium perenne* L.	Poaceae	PH	May-June	D	383
358.	*L. persicum* Boiss. and Hohen.	Poaceae	AH	May-June	D	384
359.	*L. temulentum* L.	Poaceae	PH	May-June	A	385
360.	*Maianthemum purpureum* (Wall.) La.	Asparagaceae	PH	May-June	R	1850
361.	*Oplismenus compositus* (L.) P.Beauv.	Poaceae	PH	August-September	O	375
362.	*O. undulatifolius* (Ard.) Roem. and Schult.	Poaceae	PH	August-September	F	376
363.	*Pennisetum flaccidum* Griseb	Poaceae	PH	July-September	F	323
364.	*P. orientale* Nees ex Steud.	Poaceae	PH	July-September	F	334
365.	*Poa annua* L.	Poaceae	AH	February-March	D	136
366.	*Polygonatum multiflorum* (L.) All.	Asparagaceae	PH	May-June	R	1793
367.	*Polypogon fugax* Nees ex Steud.	Poaceae	AH	June-September	F	312
368.	*P. monspeliensis* (L.) Desf.	Poaceae	AH	June-September	A	313
369.	*Sauromatum venosum* (Aiton) Kunth	Araceae	PH	July-August	O	1004
370.	Schoenocaulon sp.	Melanthiaceae	PH	June-July	R	660
371.	*Schoenoplectus corymbosus* (Roth ex Roem. and Schult.) J. Roynal	Cyperaceae	PH	May-August	F	503
372.	*Scilla griffithii* Hochr	Asparagaceae	PH	April-May	O	662
373.	*Setaria pumila* (Poir.) Roem. and Schult	Poaceae	AH	June-October	O	322
374.	*Smilax aspera* L.	Smilacaceae	Liana	September-October	R	353
375.	*S. glaucophylla* Klotzsch	Smilacaceae	PH	September-October	R	1887
376.	*Sorghum halepense* (L.) Pers.	Poaceae	PH	May-October	F	360
377.	*Spiranthes sinensis* (Pers.) Ames	Orchidaceae	PH	July-August	R	954
378.	*Sporobolus helvolus* (Trin.) T.Durand and T. Schinz	Poaceae	PH	May-June	O	364
379.	*Themeda anathera* (Nees ex Steud.)Hack.	Poaceae	PH	May-August	D	366
380.	*Tulipa clusiana* DC.	Liliaceae	PH	April-May	F	605
381.	*Zeuxine strateumatica* (L.) Schlechter	Orchidaceae	PH	July-August	A	1944

Key: AH= Annual herb PH= Perennial herb BH= Biennial herb SS= Subshrub Ab= Abundance D= Dominant
F= Frequent A= Abundant O= Occasional R= Rare

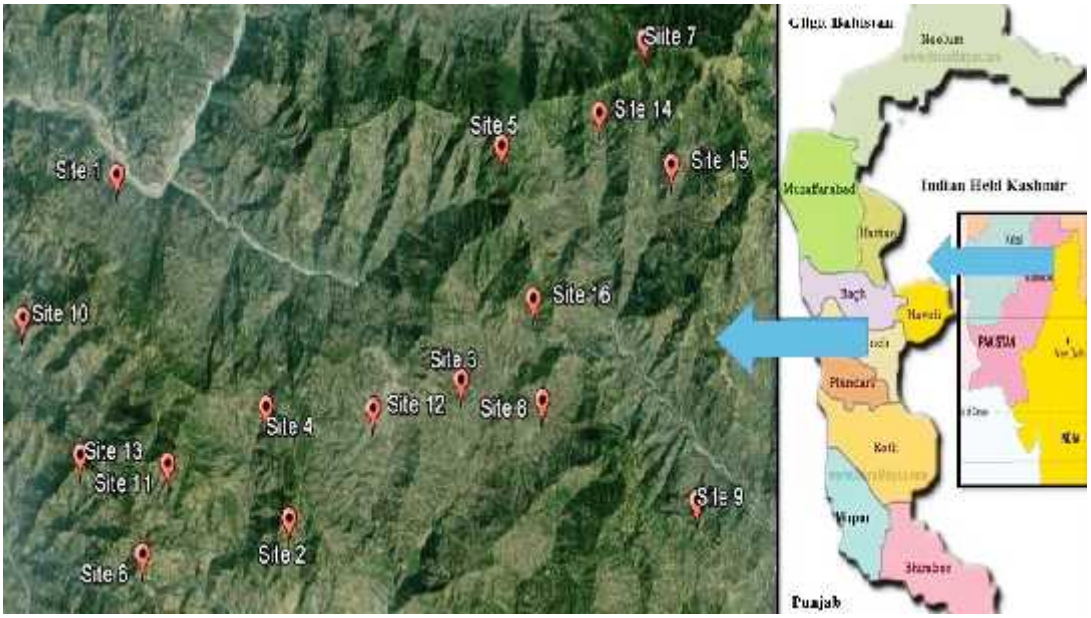

Figure 01. Geographic location of study area (Right) and satellite imagery of sampling sites (Left): Site 1 Bangoin, Site 2 Rehara, Site 3 Rawalakot, Site 4 Hurnamera, Site 5 Singola, Site 6 Thorar, Site 7 Danna, Site 8 Dhamni, Site 9 Dothan, Site 10 Tain, Site 11 Pachiot, Site 12 Drake, Site 13 Datote, Site 14 Pakhar, Site 15 Ali soujal, Site 16 Khai Gala.

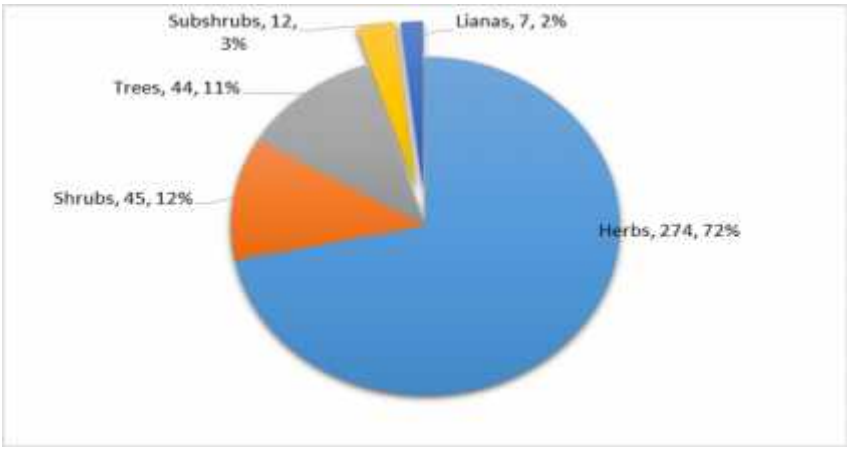

Figure 02. Life forms in the Flora of Rawalakot

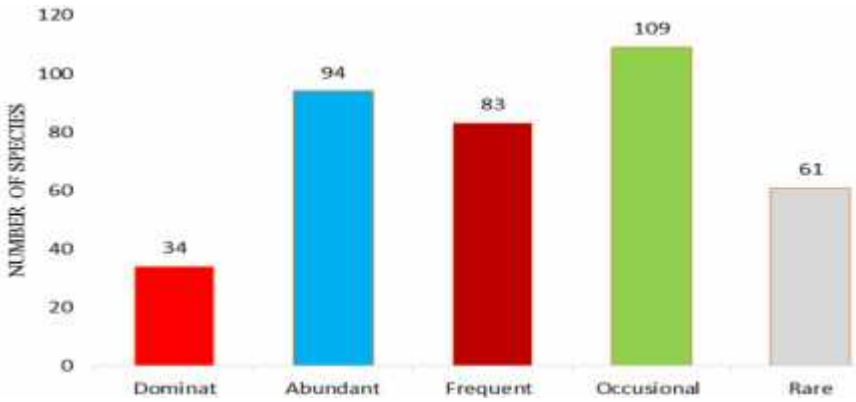

Figure 03: Abundance of Different Species in Rawalakot

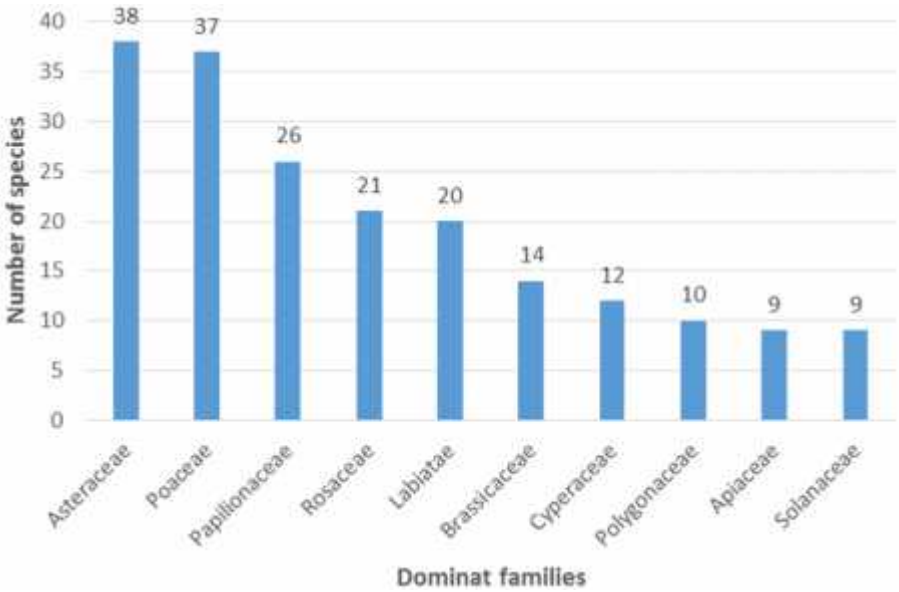

Figure 04. Dominant Families in the Flora of Rawalakot

a: *Aristolochia punjabensis* Lace

b: *Crotalaria medicaginea* Lam.

c: *Hypericum oblongifolium* Choisy

d: *Polygonatum multiflorum* (L.) All.

e: *Vitex negundo* L.

f: *Podophyllum emodi* Wall. ex Hook. F. and Thomson

DISCUSSION

Rawalakot a Western Himalayan region has rich floral diversity. The total number of angiosperms species reported from study area of about 382 Km^2 is 381 which is about 6.35% of total angiosperm diversity in Pakistan. Flora is dominated by 273 (71.9 %) herbaceous species followed by 45 shrubs (11.81%), 44 trees (11.54%), 12 subshrubs (3.14%) and 7 lianas (1.83%). The abundance category of flora of Rawalakot showed that there are 34 dominant species, 94 abundant, 83 frequent, 109 occasional and 61 species are rare. Similar studies were also conducted by Haq *et al*. (2010) from Western Himalayan region Nandiar Valley District Battgram and recoded 402 species of 110 families. The life form data showed that out of 402 species 271 were herbs, 71 shrubs, 68 trees, 6 climbing shrubs, 18 climbers and 3 epiphytes. Rana *et al.* (2010) conducted vegetation surveys of Tons Valley, Garhwal Himalaya India and identified 761 species of Phanerogams belonging to 480 genera and 132 families and concluded that flora of Tons valley has affinities with flora of neighbouring regions. Present study can also be compared with Qureshi *et al*. (2011) and Standen *et al*. (2013). Woody flora is very important because variations in woody flora influences species composition and distribution. A total of 44 (11.54%) tree species belonging to 27 genera and 18 families were recorded from Rawalakot. Two species *Dalbergia sissoo* and *Olea ferruginea* were dominating in areas with lower altitude like Hellann, Tainn, Lower Paniola, Dar and Androot and four species *Populus ciliata, Salix alba, Aesculus indica* and *Robinia pseudo-acacia* were dominating in areas located at higher altitude like Rawalakot city, Bunjosa, Paniola, Drake and Hussain kot. But increasing demands for fuel wood decreasing population of these species. As stated by Hosier (1993) in Pakistan consumption of wood exceeds its production resulting declining of woody biomass at a rate of 4-6% per year. He concluded that Pakistan woody biomass could by totally consumed with in 10-15 years.

Himalaya a young mountain system connects mountains of near East and Central Asia with East Asia being situated between Indian subcontinent and central Asia. Phyto geographically Himalayan flora is a transition zone between palaeotropic and Holarctic kingdoms (Rana *et al*., 2010). The native flora of Himalaya not only greatly modified but also came in contact with Eurasian and northern African flora and rest of the world (Puri *et al*., 1983). Rawalakot, integral part of Western Himalaya also have number of species from the surrounding areas. The introduction of foreign plants and animal species for food, fuel wood, timber and fodder has a long history in Pakistan (Shinwari *et al*., 2006). The number of alien species in Pakistan is about 700 (Hussain and Zarif, 2003) of these about 100 species have become naturalized and 20 species are invasive. Six species i.e., *Prosopis juliflora Broussonetia papyrifera, Parthenium hysterophorus, Lantana camara, Eichhornia crassipes* and *Salvinia molesta* are graded as highly invasive (Shinwari *et al*., 2010). The alien invasive species is one of the major threats to biodiversity that could eliminate native taxa from their natural habitat. Because when an alien species flourish in a new land it compete with native taxa for nutrients, space and water causing elimination of rare taxa (Khan *et al*., 2010). In Rawalakot 9 species viz., *Conyza bonariensis, C. canadensis, Parthenium hysterophorus, Xanthium strumarium, Tagetes minuta, Broussonetia papyrifera, Robinia pseudo-acacia, Lantana camara* and *Cannabis sativa* can be graded as highly invasive. Three species *Broussonetia papyrifera, Parthenium hysterophorus, Lantana camara* also categorized as highly invasive species of Pakistan. *Parthenium hysterophorus* recently introduced in the area approaching higher altitude

dominates along the road sides which connect Rawalakot to Rawalpindi District of Pakistan. *Tagetes minuta* and *Cannabis sativa* mostly dominate along roads, disturbed sites around the waste places of town area. *Xanthium strumarium* and *conyza* spp are the invasive weeds of crop field. As a result many of the previously crop field are now converted into waste land. Two fuel wood species *Broussonetia papyrifera* and *Robinia pseudo-acacia* are cultivated for fuel purposes. *Robinia Pseudo-acacia* dominates above 1300 m and *Broussonetia papyrifera* cultivated below 1300 m along the road sides for fuel and ornamental purposes. Present study can be compared with Sekar (2012) who reported 190 invasive alien species of 112 genera and 47 families from Indian Himalayan region and proposed that invasive species cause biodiversity loss including extinction of native species. Thus, it is concluded that invasive exotic species are serious threats to biodiversity of native species. Therefore there is an urgent need of effective plan of management for the conservation of invasive species and endemic taxa of the study area.

The flora of Rawalakot is under enormous biotic pressure. The earthquake 2005 has resulted in habitat loss, deforestation, cultivation of commercial trees, overgrazing, medicinal plants collection, unawareness and poor implementation of conservation policies. These factors have resulted in decline of species and genetic diversity. Mora and Sale (2011) stated that human have direct effect on about 80% of land of earth surface. As a result of this misuse of land leads to more species threatened by extinction. If present notion of biodiversity loss continue, one fifth of total existing taxa may become extinct or genetically eroded (Wilson, 1992). As proposed by Meyer and Turner (1992) that anthropogenic activities has directly altered the land cover, as these activities disturbed the natural habitat, leaving less place for native species as a result the number of native species may also reduce. In Rawalakot, out of 381 species recoded during this study 61 (16%) species were placed in rare category, which were threatened. Tree flora is represented by 12 rare species of which *Ulmus wallichiana* is declared endangered species of Pakistan. Wood is used as fuel and timber and leaves are highly palatable. As a result population of this species is reduced to alarming level. Two villages of Rawalakot, Drake and Kharikk were named on basis of previously dominant population of *Melia azedarach* (local name: Drake) and *Celtis eriocarpa* (local name: Kharikk) but both were so exploited for fuel that their population is now reduced to few. Other rare species of the area were *Ficus carica, Bauhinia variegata, Grewia eriocarpa, Populus alba, Acer caesium, Sapindus mukorossi* and *Albizia odoratissima*. Shrubs of the area were represented by 45 species belonging to 35 genera and 24 families. Shrub flora includes 14 rare species which were used for multiple purposes. Most important from the conservation point of view were *Debregeasia salicifolia, Zanthoxylum armatum, Hypericum oblongifolium, Astragalus psilocentros, Cotoneaster microphyllus, C. roseus, Cydonia oblonga, Buddleja asiatica, Calotropis procera* and *Vitex negundo*. Flora of Rawalakot also include 26 herbaceous, one liana and two subshrubs which were rare. Bano *et al*. (2013) conducted ethnobotanical and conservation status of 168 species of flora of Azad Kashmir and allied area and concluded that 33 species are rare and important from conservation point of view. They proposed that in-situ and ex-situ conservation and training of community could be fruitful for protecting medicinal plant resource. Rawalakot is rich in floral diversity and is not explored fully from taxonomic and ethnobotanical point of view. Anthropogenic activities like unwise extraction of medicinal plants, deforestation, door to door road construction, annual fire practices, illegal trade of medicinal plants and unawareness are the factors which deteriorate flora. Therefore awareness programs and coordination among local communities, research institutes and forest department is urgently needed for conservation of flora of Rawalakot.

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