



STUDIES ON THE WEED FLORA OF AGASTYAMUNI BLOCK, RUDRAPRAYAG DISTRICT, UTTARAKHAND

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Abstract: Weed commonly called ‘khar- kabad’ in Uttarakhand or ‘kharpatvar’ in India, and is one of the major biological constraints that limits crop productivity. The present communication pertains to survey and inventory of weed flora in Agastyamuni block of district Rudraprayag, Uttarakhand. The study was based on extensive and intensive field survey made during July 2018 to October 2019. During the study period the authors have reported a total 312 species belonging to 188 genera and 54 families from dicots, monocots and pteridophyta. Asteraceae was found to be the most dominant family followed by Poaceae, Lamiaceae and Fabaceae respectively. Survey results also revealed that most of the recorded species were annuals followed by perennials and biennials. Most abundant species were *Bidense pilosa*, *Chenopodium album*, *Erigeron canadensis*, *Cynodon dactylon*, *Gallinsogo parviflora*, *Eupatorium adenophorum*, *Oxalis corniculata*, *Parthenium hysterophorus*, *Lantana camara*, *Sonchus arvensis*, *Ageratum conyzoides*, *Plantago major*, *Ganaphallium lutealbum*, *Siegesbeckia orientalis*, *Youngia japonica*, *Amaranthus viridis*, *Stellaria media* and *Phalaris minor*. Many weeds are ethnobotanically important and utilized by the local community.

Key words: Weed Flora, Rabi and Kharif Crops, Diversity, Agastyamuni, Uttarakhand

Introduction

Vegetation is the most precious gift, nature has provide us for all kind of essential requirements in the form of food, fodder, fuel, medicine, timber, oil etc (Gaur,1999). The knowledge of the floristic composition of a plant community is the prerequisite to understand the overall structure and function of an ecosystem. The present study reveals the common weed of Rudraprayag District in Uttarakhand State.

Baker (1965) has defined that “a plant is a weed if any specified geographical area, its populations grow entirely or predominantly in situations markedly disturbed by man (without, of course being deliberately cultivated plants)”. Jethro Tull (1731) was the first person to use the term “weed” in literatures in his famous writing on ‘Horse

hoeing husbandry’. Weed is generally considered to be noxious if it is exotic (non-native), spread, easily, difficult to control, have negative impact on agriculture, navigation and is injurious to human health, livestock, wildlife, lake and other property (Larry et al. 1996). It decreases the yield of crops by competing for water, common nutrients, space, carbon dioxide and sunlight, act as alternate host for pathogens and other organisms (Peters, 1955). Moreover, the weeds mature ahead of crops so that their seeds get mixed with crop seed and replace or overlaps the endemic habitats weeds reduced the yield of wheat crop by 34.4% in India (Tiwari and Parihar 1993). Weeds differ from other plants in being more adaptive and having peculiar characteristic



that make them more competitive (Dangwal et al. 2010).

In view of importance of the problem, the present study was conducted to find out the Rabi and Kharif crops season weeds flora, which will further help in future in formulating a good weed control program.

Material and Methods

Study Area: Uttarakhand is well known for its biodiversity richness and diverse cultural mosaic. The state comprises of 13 district and lies between 28°43'-31°8' N and 77°35'-81°2' E. The study was carried out in Agastyamuni Block of Rudraprayag district which occupies an area of 2439 km². The district is located at 30.28°N, 78.98°E. It has an average elevation of 895 msl (2,936 feet).

Methodology

Survey and Collection: Extensive field surveys were undertaken in almost all parts of the Rudraprayag district from July 2018 to October 2019. The first step was the study of basic information about weed plants and involving question related the weed with local inhabitants. Field notes on some of the important characters like habit, habitat, shape and size, floral, fruit characters, season, ecological features and phytosociological association were instantly recorded. The kharif cropping season starts with the onset of monsoon, i.e., from mid June to October and mostly grows the paddy (*Oryza sativa*), maize (*Zea mays*), jhangora (*Echinochloa frumentacea*), finger millet (*Eleusine coracana*), soyabean and pulses. Rabi crops are known winter crops, grown in October - November and harvest in spring and summer, i.e., wheat (*Triticum*

aestivum) barley (*Hordeum vulgare*), mustard and pulses.

Identification: Each species was identified with the help of existing flora (Naithani, 1984-1985, Gaur, 1999). The specimens information of plants was collected, processed, documented and finally deposited in the herbarium of the department of Botany Govt. P.G. college Agastyamuni as reference material.

Results and Discussion

A total 312 species belonging to 188 genera and 54 families were identified from the Rudraprayag District. During the field study, the weed species sampled were belonging to dicot, monocot and pteridophyta. Asteraceae was found to be most dominant family followed by Poaceae, Lamiaceae and Fabaceae respectively. Survey results also revealed that most of the recorded species were annuals followed by perennials and biennials. There were 31 species which were abundantly found, whereas 50 species were commonly and 30 species were rare. Most abundant species were *Bidense pilosa*, *Chenopodium album*, *Erigeron canadensis*, *Cynodon dactylon*, *Gallinsogo parviflora*, *Eupatorium adenophorum*, *Oxalis conrniculata*, *Parthenium hysterophorus*, *Lantanacamara*, *Sonchus arvensis*, *Ageratum conozoides*, *Plantago major*, *Ganaphallium lutealbum*, *Siegesbeckia orientalis*, *Youngia japonica*, *Amaranthus virids*, *Stellaria media*, *Commelina benghalensis*, *Euphorbia heterophylla*, *Colebrookia oppositifolia*, *Rumex hastatus*, *Xanthium strumarium*, *Dactyloctenium aegyptium*, *Digitaria abyssinica*, *Setaria virids*, *Phalaris minor*, *Polypogon monspeliensis*, *Cyperus rotunds*, *Euphorbia heterophylla*, *Eleusine indica* and *Anagallis arvensis*.

**Table 1:** Botanical names, family, life form and voucher specimen of the weeds of Rudraprayag district, Uttarakhand

SN	Botanical Name	Family	Life form	Voucher No. of Specimen
1	<i>Ageratum conyzoides</i>	Asteraceae	Annual	1
2	<i>Ageratum houstonianum</i>	Asteraceae	Annual	2
3	<i>Anaphalis margaritaceae</i>	Asteraceae	Annual	3
4	<i>Anaphalis sp.</i>	Asteraceae	Annual	4
5	<i>Artemisia ludoviciana</i>	Asteraceae	Annual	5
6	<i>Artemisia vulgaris</i>	Asteraceae	Annual	6
7	<i>Arctium tementosus</i>	Asteraceae	Annual	7
8	<i>Blumea lacera</i>	Asteraceae	Annual	8
9	<i>Bidens pilosa</i>	Asteraceae	Annual	9
10	<i>Bidense bipinnata</i>	Asteraceae	Annual	10
11	<i>Bidense biternata</i>	Asteraceae	Annual	11
12	<i>Bellis perennis</i>	Asteraceae	Annual	12
13	<i>Bellis sp.</i>	Asteraceae	Annual	13
14	<i>Conyza japonica</i>	Asteraceae	Annual	14
15	<i>Conyza aegyptiaca</i>	Asteraceae	Annual	15
16	<i>Cirsium arvense</i>	Asteraceae	Perennial	16
17	<i>Cirsium wallichii</i>	Asteraceae	Perennial	17
18	<i>Cotula sp.</i>	Asteraceae	Annual	18
19	<i>Crepis foetida</i>	Asteraceae	Annual	19
20	<i>Carthamus oxycantha</i>	Asteraceae	Perennial	20
21	<i>Dichrocephala integrifolia</i>	Asteraceae	Annual	21
22	<i>Emilia sonchifolia</i>	Asteraceae	Annual	22
23	<i>Erigeron Canadensis</i>	Asteraceae	Annual	23
24	<i>Erigeron bonariensis</i>	Asteraceae	Annual	24
25	<i>Erigeron sp.</i>	Asteraceae	Annual	25
26	<i>Erigeron sp.</i>	Asteraceae	Annual	26
27	<i>Eupatorium adenophorum</i>	Asteraceae	Annual	27
28	<i>Ganaphallium luteoalbum</i>	Asteraceae	Annual	28
29	<i>Galinsoga parviflora</i>	Asteraceae	Annual	29
30	<i>Galinsoga quadriradiata</i>	Asteraceae	Annual	30
31	<i>Galinsoga sp.</i>	Asteraceae	Annual	31
32	<i>Hypochaeris maculate</i>	Asteraceae	Annual	32
33	<i>Parthenium hysterophorus</i>	Asteraceae	Annual	33
34	<i>Sonchus asper</i>	Asteraceae	Annual	34
35	<i>Sonchus arvensis</i>	Asteraceae	Annual	35
36	<i>Sonchus oleraceus</i>	Asteraceae	Annual	36
37	<i>Siegesbeckia orientalis</i>	Asteraceae	Annual	37
38	<i>Sphaeranthus indicus</i>	Asteraceae	Annual	38
39	<i>Sadilego sp.</i>	Asteraceae	Annual	39
40	<i>Senecio vulgaris</i>	Asteraceae	Annual	40
41	<i>Saussurea sp.</i>	Asteraceae	Annual	41
42	<i>Saussurea sp.</i>	Asteraceae	Annual	42
43	<i>Sclerocarpus africanus</i>	Asteraceae	Annual	43
44	<i>Synotis sp.</i>	Asteraceae	Annual	44



45	<i>Tridax procumbens</i>	Asteraceae	Annual	45
46	<i>Taraxacum officinale</i>	Asteraceae	Annual	46
47	<i>Tagetes minuta</i>	Asteraceae	Annual	47
48	<i>Tagetes erecta</i>	Asteraceae	Annual	48
49	<i>Vernonia sp.</i>	Asteraceae	Annual	50
50	<i>Xanthium strumarium</i>	Asteraceae	Annual	51
51	<i>Vicoa indica</i>	Asteraceae	Annual	52
52	<i>Youngia japonica</i>	Asteraceae	Annual	53
1	<i>Alternanthera sessilis</i>	Amaranthaceae	Annual	54
2	<i>Amaranthus viridis</i>	Amaranthaceae	Annual	55
3	<i>Amaranthus gracilis</i>	Amaranthaceae	Annual	56
4	<i>Amaranthus spinosus</i>	Amaranthaceae	Annual	57
5	<i>Amaranthus sp.</i>	Amaranthaceae	Annual	58
6	<i>Achyranthes aspera</i>	Amaranthaceae	Annual	59
7	<i>Achyranthus sp.</i>	Amaranthaceae	Annual	60
8	<i>Cyathula cylindrical</i>	Amaranthaceae	Annual	61
9	<i>Cyathula achyranthoides</i>	Amaranthaceae	Perennial	62
10	<i>Cyathula prostrate</i>	Amaranthaceae	Perennial	63
11	<i>Chenopodium album</i>	Amaranthaceae	Annual	64
12	<i>Dysphania ambrosiodes</i>	Amaranthaceae	Annual	65
13	<i>Digera muricata</i>	Amaranthaceae	Annual	66
14	<i>Gomphrena serrate</i>	Amaranthaceae	Annual	67
15	<i>Gomphrena celosioides</i>	Amaranthaceae	Annual	68
1	<i>Barleria cristata</i>	Acanthaceae		69
2	<i>Barleria prionitis</i>	Acanthaceae	Annual	70
3	<i>Barleria sp.</i>	Acanthaceae	Annual	71
4	<i>Blepharis sp.</i>	Acanthaceae	Annual	72
5	<i>Dicliptera bupleuroides</i>	Acanthaceae	Perennial	73
6	<i>Peristrophe paniculata</i>	Acanthaceae	Annual	74
7	<i>Strobilanthes wallichii</i>	Acanthaceae	Annual	75
1	<i>Agave sp.</i>	Asparagaceae	Perennial	76
2	<i>Asperagus racemosus</i>	Asparagaceae	Perennial	77
1	<i>Asplenium adiantum-nigrum</i>	Aspleniaceae	Annual	78
2	<i>Asplenium ceterach</i>	Aspleniaceae	Annual	79
3	<i>Asplenium trichomanes</i>	Aspleniaceae	Annual	80
1	<i>Cyclosporum leptophyllum</i>	Apiaceae	Annual	81
2	<i>Centella asiatica</i>	Apiaceae	Annual	82
3	<i>Lamium amplexicala</i>	Apiaceae	Annual	83
4	<i>Lamium sp.</i>	Apiaceae	Annual	84
5	<i>Senicula europaea</i>	Apiaceae	Annual	85
1	<i>Colocasia esculenta</i>	Aracaceae	Perennial	86
2	<i>Phoenix dactylifera</i>	Aracaceae	Perennial	87
1	<i>Hedera helix</i>	Araliaceae	Annual	88
2	<i>Hedera nepalensis</i>	Araliaceae	Annual	89
3	<i>Hedera sp.</i>	Araliaceae	Annual	90
1	<i>Trianthema portulaeastrum</i>	Aizoaceae	Annual	91



1	<i>Capsella bursa-pastoris</i>	Brassicaceae	Annual	92
2	<i>Coronopus didymus</i>	Brassicaceae	Annual	93
3	<i>Nasturtium officinale</i>	Brassicaceae	Annual	94
4	<i>Sinapis arvensis</i>	Brassicaceae	Annual	95
1	<i>Cynoglossum zeylanicum</i>	Boraginaceae	Annual	96
1	<i>Arenaria serpyllifolia</i>	Caryophyllaceae	Annual	100
2	<i>Drymaria cordata</i>	Caryophyllaceae	Annual	101
3	<i>Drymaria sp.</i>	Caryophyllaceae	Annual	102
4	<i>Stellaria neglecta</i>	Caryophyllaceae	Annual	103
5	<i>Stellaria media</i>	Caryophyllaceae	Annual	104
6	<i>Spergula arvensis</i>	Caryophyllaceae	Annual	105
1	<i>Cyperus difformis</i>	Cyperaceae	Annual	106
2	<i>Cyperus esculentus</i>	Cyperaceae	Annual	107
3	<i>Cyperus iria</i>	Cyperaceae	Annual	108
4	<i>Cyperus tenuispica</i>	Cyperaceae	Annual	109
5	<i>Cyperus rotundus</i>	Cyperaceae	Annual	110
6	<i>Cyperus kyllingia</i>	Cyperaceae	Annual	111
7	<i>Fimbristylis dichotoma</i>	Cyperaceae	Annual	112
8	<i>Juncus effuses</i>	Cyperaceae	Annual	113
1	<i>Cannabis sativa</i>	Cannabaceae	Annual	114
1	<i>Commelina benghalensis</i>	Commelinaceae	Annual	115
2	<i>Commelina communis</i>	Commelinaceae	Annual	116
3	<i>Commelina erecta</i>	Commelinaceae	Annual	117
4	<i>Commelina diffusa</i>	Commelinaceae	Annual	118
5	<i>Cynotis cristata</i>	Commelinaceae	Annual	119
1	<i>Cystopteris sp.</i>	Cystopteridaceae	Annual	120
1	<i>Convolvulus arvensus</i>	Convolvulaceae	Annual	121
2	<i>Pharbitis purpurea</i>	Convolvulaceae	Annual	122
1	<i>Coriaria nepalensis</i>	Coriariaceae	Annual	123
2	<i>Coriaria sp.</i>	Coriariaceae	Annual	124
1	<i>Companula sp.</i>	Companulaceae	Annual	125
1	<i>Cleome viscosa</i>	Cleomaceae	Annual	126
1	<i>Pteridium aquilinum</i>	Dennstaedtiaceae	Annual	127
2	<i>Pteridium caudatum</i>	Dennstaedtiaceae	Annual	128
1	<i>Euphorbia sp.</i>	Euphorbiaceae	Annual	129
2	<i>Euphorbia hirta</i>	Euphorbiaceae	Annual	130
3	<i>Euphorbia heterophylla</i>	Euphorbiaceae	Annual	131
4	<i>Euphorbia prostrate</i>	Euphorbiaceae	Annual	132
5	<i>Ricinus communis</i>	Euphorbiaceae	Perennial	133
1	<i>Elaeagnus parvifolia</i>	Elaeagnaceae	Annual	134
1	<i>Equisetum sp.</i>	Equisetaceae	Annual	135
1	<i>Crotalaria juncea</i>	Fabaceae	Annual	136
2	<i>Desmodium elegans</i>	Fabaceae	Annual	137
3	<i>Desmodium intortum</i>	Fabaceae	Annual	138
4	<i>Desmodium triflorum</i>	Fabaceae	Annual	139
5	<i>Desmodium incanum</i>	Fabaceae	Annual	140
6	<i>Desmodium sp.</i>	Fabaceae	Annual	141
7	<i>Desmodium grahamii</i>	Fabaceae	Annual	142



8	<i>Desmodium gangeticum</i>	Fabaceae	Annual	143
9	<i>Flemingia prostrate</i>	Fabaceae	Annual	144
10	<i>Indigofera grandiflora</i>	Fabaceae	Annual	145
11	<i>Indigofera cossioides</i>	Fabaceae	Annual	146
12	<i>Indigofera sp.</i>	Fabaceae	Annual	147
13	<i>Indigofera sp.</i>	Fabaceae	Annual	148
14	<i>Lathyrus aphaca</i>	Fabaceae	Annual	149
16	<i>Lathyrus sativus</i>	Fabaceae	Annual	150
17	<i>Medicago disciformis</i>	Fabaceae	Annual	151
18	<i>Medicago polymorpha</i>	Fabaceae	Annual	152
19	<i>Melilotus indica</i>	Fabaceae	Annual	153
20	<i>Medicago denticulate</i>	Fabaceae	Annual	154
21	<i>Senna tora</i>	Fabaceae	Perennial	155
22	<i>Trifolium repens</i>	Fabaceae	Annual	156
23	<i>Trifolium prantense</i>	Fabaceae	Annual	157
24	<i>Trigonella corniculata</i>	Fabaceae	Annual	158
25	<i>Vicia sativa</i>	Fabaceae	Annual	159
26	<i>Vicia hirsute</i>	Fabaceae	Annual	160
27	<i>Vicia sp.</i>	Fabaceae	Annual	161
1	<i>Geranium ocellatum</i>	Geraniaceae	Annual	162
1	<i>Gentiana acaulis</i>	Gentianaceae	Annual	163
1	<i>Deutzia staminea</i>	Hydrangeaceae	Annual	164
1	<i>Reinwardtia indica</i>	Linaceae	Perennial	165
1	<i>Ajuga bracteosa</i>	Lamiaceae	Annual	166
2	<i>Anisomeles india</i>	Lamiaceae	Annual	167
3	<i>Anisochilus cornosus</i>	Lamiaceae	Annual	168
4	<i>Colebrookea oppositifolia</i>	Lamiaceae	Annual	169
5	<i>Callicarpa macrophylla</i>	Lamiaceae	Annual	170
6	<i>Hyptis suaveolens</i>	Lamiaceae	Perennial	171
7	<i>Isodon coetsa</i>	Lamiaceae	Annual	172
8	<i>Leucas hyssopifolia</i>	Lamiaceae	Annual	173
9	<i>Leucas aspera</i>	Lamiaceae	Annual	174
10	<i>Leucas lanata</i>	Lamiaceae	Annual	175
11	<i>Leucus sp.</i>	Lamiaceae	Annual	176
12	<i>Lindera sp.</i>	Lamiaceae	Annual	177
13	<i>Mentha longifolia</i>	Lamiaceae	Annual	178
14	<i>Micromeria biflora</i>	Lamiaceae	Annual	179
15	<i>Nepeta leucophylla</i>	Lamiaceae	Annual	180
16	<i>Nepeta sp.</i>	Lamiaceae	Annual	181
17	<i>Nepeta sp.</i>	Lamiaceae	Annual	182
18	<i>Nepeta ciliaris</i>	Lamiaceae	Annual	183
19	<i>Ocimum teuniflorum</i>	Lamiaceae	Annual	184
20	<i>Pogostemon plectranthus</i>	Lamiaceae	Perennial	185
21	<i>Pogostemon benghalensis</i>	Lamiaceae	Perennial	186
22	<i>Pogostemon sp.</i>	Lamiaceae	Perennial	187
23	<i>Salvia plebeian</i>	Lamiaceae	Annual	188
24	<i>Scutellaria lateriflora</i>	Lamiaceae	Annual	189
25	<i>Scutellaria altissima</i>	Lamiaceae	Annual	190



26	<i>Scutellaria baicalensis</i>	Lamiaceae	Annual	191
27	<i>Scutellaria galericulata</i>	Lamiaceae	Annual	192
28	<i>Strobilanthes wallichii</i>	Lamiaceae	Annual	193
1	<i>Marselia quadrifolia</i>	Marsileaceae	Annual	194
1	<i>Malvastrum coromandelianum</i>	Malvaceae	Annual	195
2	<i>Malva parviflora</i>	Malvaceae	Annual	196
3	<i>Sida cordifolia</i>	Malvaceae	Annual	197
4	<i>Sida rhombifolia</i>	Malvaceae	Annual	198
5	<i>Urena lobata</i>	Malvaceae	Annual	199
1	<i>Boerhavia diffusa</i>	Nyctaginaceae	Annual	200
2	<i>Boerhavia erecta</i>	Nyctaginaceae	Annual	201
1	<i>Oxalis corniculata</i>	Oxalidaceae	Annual	202
2	<i>Oxalis corymbosa</i>	Oxalidaceae	Annual	203
3	<i>Oxalis martiana</i>	Oxalidaceae	Annual	204
4	<i>Oxalis latifolia</i>	Oxalidaceae	Annual	205
5	<i>Oxalis debilis</i>	Oxalidaceae	Annual	206
1	<i>Avena fatua</i>	Poaceae	Annual	207
2	<i>Arundo donax</i>	Poaceae	Annual	208
3	<i>Cynodon dactylon</i>	Poaceae	Annual	209
4	<i>Chloris barbata</i>	Poaceae	Annual	210
5	<i>Dactyloctenium aegyptium</i>	Poaceae	Annual	211
6	<i>Chrysopogon festucoides</i>	Poaceae	Annual	212
7	<i>Cryspogon Sp.</i>	Poaceae	Annual	213
8	<i>Digitaria abyssinica</i>	Poaceae	Annual	214
9	<i>Digitaria sanguinalis</i>	Poaceae	Annual	215
10	<i>Digitaria ciliaris</i>	Poaceae	Annual	216
11	<i>Digitaria sanguinalis</i>	Poaceae	Annual	217
12	<i>Digitaria sp.</i>	Poaceae	Annual	218
13	<i>Eleusine indica</i>	Poaceae	Annual	219
14	<i>Echinochloa colona</i>	Poaceae	Annual	220
15	<i>Eragrostis atrovirens</i>	Poaceae	Annual	221
16	<i>Eragrostis tenella</i>	Poaceae	Annual	222
17	<i>Imperata cylindrical</i>	Poaceae	Annual	223
18	<i>Oplismenus compositus</i>	Poaceae	Annual	224
19	<i>Oplismenus burmannii</i>	Poaceae	Annual	225
20	<i>Polypogon monspeliensis</i>	Poaceae	Annual	226
21	<i>Poa annua</i>	Poaceae	Annual	227
22	<i>Phalaris minor</i>	Poaceae	Annual	228
23	<i>Panicum repens</i>	Poaceae	Annual	229
24	<i>Pennisetum purpureum</i>	Poaceae	Annual	230
25	<i>Setaria pumila</i>	Poaceae	Annual	231
26	<i>Setaria palmifolia</i>	Poaceae	Annual	232
27	<i>Sateria gluaca</i>	Poaceae	Annual	233
28	<i>Sorghum halepense</i>	Poaceae	Annual	234
29	<i>Setaria sp.</i>	Poaceae	Annual	235
30	<i>Setaria verticillata</i>	Poaceae	Annual	236
31	<i>Saccharum spontaneum</i>	Poaceae	Annual	238
32	<i>Saccharum sp.</i>	Poaceae	Annual	239



1	<i>Adiantum capilus</i>	Pteridaceae	Annual	240
2	<i>Notholaena californica</i>	Pteridaceae	Annual	241
3	<i>Pteris vittate</i>	Pteridaceae	Annual	242
4	<i>Pteris muricata</i>	Pteridaceae	Annual	243
5	<i>Pteris wallichiana</i>	Pteridaceae	Annual	244
6	<i>Pteris cretica</i>	Pteridaceae	Annual	245
1	<i>Plantago major</i>	Plantaginaceae	Annual	246
2	<i>Scoparia dulcis</i>	Plantaginaceae	Annual	247
3	<i>Veronica hederifolia</i>	Plantaginaceae	Annual	248
1	<i>Fumaria pariviflora</i>	Papavaraceae	Annual	249
1	<i>Portulaca sp.</i>	Portulacaceae	Annual	250
2	<i>Portulaca oleracea</i>	Portulacaceae	Annual	251
1	<i>Fagopyrum esculentum</i>	Polygonaceae	Annual	252
2	<i>Rumex hastatus</i>	Polygonaceae	Annual	253
3	<i>Rumex dentatus</i>	Polygonaceae	Annual	254
4	<i>Rumex nepalensis</i>	Polygonaceae	Annual	255
5	<i>Polygonum hirsutum</i>	Polygonaceae	Annual	256
6	<i>Polygonum sp.</i>	Polygonaceae	Annual	257
6	<i>Polygonum nepalensis</i>	Polygonaceae	Annual	258
7	<i>Polygonum capitatum</i>	Polygonaceae	Annual	259
8	<i>Polygonum aviculare</i>	Polygonaceae	Annual	260
9	<i>Polygonum plebeium</i>	Polygonaceae	Annual	261
10	<i>Polygonum barbatum</i>	Polygonaceae	Annual	262
1	<i>Anagallis arvensis</i>	Primalaceae	Annual	263
1	<i>Duchesnea indica</i>	Rosaceae	Annual	264
2	<i>Potentilla reptans</i>	Rosaceae	Annual	265
3	<i>Rosabrunonii</i>	Rosaceae	Perennial	266
4	<i>Pyracantha crenulata</i>	Rosaceae	Perennial	267
5	<i>Prinsepia utilis</i>	Rosaceae	Perennial	268
6	<i>Potentilla sp.</i>	Rosaceae	Annual	269
7	<i>Potentilla canadensis</i>	Rosaceae	Annual	270
8	<i>Potentilla sp.</i>	Rosaceae	Annual	271
9	<i>Rubus occidentalis</i>	Rosaceae	Perennial	372
10	<i>Rubus ellipticus</i>	Rosaceae	Perennial	273
11	<i>Rosa multiflora</i>	Rosaceae	Perennial	274
1	<i>Ziziphus nummularia</i>	Rhamnaceae	Perennial	275
1	<i>Ranunculus arvensis</i>	Ranunculaceae	Annual	276
2	<i>Ranunculus sceleratus</i>	Ranunculaceae	Annual	277
3	<i>Ranunculus repens</i>	Ranunculaceae	Annual	278
4	<i>Ranunculus sp.</i>	Ranunculaceae	Annual	279
5	<i>Thalictrum foliolosum</i>	Ranunculaceae	Annual	280
6	<i>Thalictrum sp.</i>	Ranunculaceae	Annual	281
1	<i>Leptodermis lanceolata</i>	Rubiaceae	Binnial	282
2	<i>Gallium aparine</i>	Rubiaceae	Annual	283
3	<i>Gallium sp.</i>	Rubiaceae	Annual	284
4	<i>Rubia cordifolia</i>	Rubiaceae	Perennial	285
1	<i>Lycopersicon sp.</i>	Solanaceae	Annual	286
2	<i>Solanum nigrum</i>	Solanaceae	Annual	287



3	<i>Solanum americanum</i>	Solanaceae	Annual	288
4	<i>Solanum viarum</i>	Solanaceae	Annual	289
1	<i>Smilax aspera</i>	Smilacaceae	Perennial	290
2	<i>Smilax sp.</i>	Smilacaceae	Perennial	291
1	<i>Buddleja asiatica</i>	Scrophulariaceae	Perennial	292
2	<i>Buddleja sp.</i>	Scrophulariaceae	Perennial	293
3	<i>Verbascum Thapsus</i>	Scrophulariaceae	Annual	294
4	<i>Mimulus sp.</i>	Scrophulariaceae	Perennial	295
5	<i>Mazus pumilus</i>	Scrophulariaceae	Annual	296
6	<i>Lindernia ciliate</i>	Scrophulariaceae	Annual	297
7	<i>Lindernia parviflora</i>	Scrophulariaceae	Annual	298
8	<i>Scrophularia Chinese</i>	Scrophulariaceae	Annual	299
1	<i>Salix sp.</i>	Saliaceae	Perennial	300
1	<i>Elatostema monandrum</i>	Urticaceae	Annual	301
2	<i>Girardinia diversifolia</i>	Urticaceae	Perennial	302
3	<i>Bohemeria platyphylla</i>	Urticaceae	Perennial	303
4	<i>Bohemeria rugulosa</i>	Urticaceae	Perennial	304
5	<i>Elatostema reticulatum</i>	Urticaceae	Perennial	305
6	<i>Pilea scripta</i>	Urticaceae	Perennial	306
7	<i>Pauzolzia hirta</i>	Urticaceae	Annual	307
8	<i>Urtica dioica</i>	Urticaceae	Perennial	308
1	<i>Barberis vulgaris</i>	Verbenaceae	Perennial	309
2	<i>Lantana camara</i>	Verbenaceae	Perennial	310
3	<i>Lantana indica</i>	Verbenaceae	Perennial	311
1	<i>Viola sp.</i>	Violaceae	Annual	312

Almost all the identified and collected species were found in flowering stage during the survey. Most flora was indigenous accepts some exotic (*Parthenium hysterophores*, *Lantana camara* and *Eupatorium adenophorum*), which infest the larger area of district Rudraprayag. This is well known weed infesting many countries (Williams and Grovers, 1980). Like other Asteraceous species, it has a minute seeds armed with hairy attachment that facilitate its dispersal by wind. Therefore, it is spreading at an alarming pace in various parts of the country (Shah and Khan, 2006). Grassy weeds were mostly found in Rudraprayag district along with sedges species. Whereas, *Lantana camara*, *Malvestrum coromenedelianum* and *Parthenium hysterophorus* were other invasive weeds which also infested a large area. These problematic weeds require continuous hoeing and weeding to reduce the competition amongst the desired species. The study also revealed that the ecological weed

species showed dominancy in Rudraprayag district and were spreading at large scale. The possible reason could be the availability of plentiful moisture, temperatures and undisturbance of species. Furthermore, the common species were found more competitive due to rapid growth. Dangwal et al, (2010) also opined that weeds grow in association with agricultural crops and bring about significance decline due to their competition with crop plants for sunlight, space and nutrients etc. According to Rao and Nagamini (2010), weeds compete with crops for natural and applied resources besides being responsible for reducing quality of agricultural productivity. Shailey and Gaur (1993) and Tiwari et al. (2016) studied the phytosociological association of crops and weeds of Pauri district of Uttarakhand and recorded 180 weed species to belonging to 50 Angiosperm families. The dominant dicot families were Amaranthaceae, Apiaceae and Brassicaceae in their



studies. Gupta et al, (2008) studied the dynamics of cereal crop weeds of Doon Valley with special reference to rice, maize and wheat fields. They reported 151 Weed species belonging to 118 and 31 families, 57 weeds were reported from rice, 77 from maize and 71 from wheat field. Kaul (1986) studied the weed flora of Kashmir Valley and reported 401 weed species belonging to 251 genera and 56 angiosperm families.

Conclusion

Weed species are major part of any area/ region of plant diversity. This study may be useful for agriculturists as well as taxonomists who are involved in the management of weeds and conservation of biodiversity in different parts of uttarakhand. All the species are not harmful to human being, animal and agriculture crops besides they may be useful for biological tools, medicine and as a good indicator of ecological adaptions, food and fodder etc. This work will also serve as manual for weed identification and recognizing their diversity in Agastyamuni valley of Rudraprayag district of Uttarakhand. Further study and exploration of weeds are directly needed to check diversity of weeds in the said region.

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