

Floristic inventory of S. R. T. campus of HNB Garhwal University (Badshahi Thaul, Tehri Garhwal, Uttarakhand): A semi-natural environment

Asha Dobhal

Department of Botany, Govt. P. G. College, New Tehri, Tehri Garhwal, Uttarakhand, India

Pramod Kumar Uniyal ✉

Department of Botany, Badshahi Thaul Campus, HNB Garhwal University, Tehri Garhwal, Uttarakhand, India

ARTICLE INFO	ABSTRACT
Received : 20 December 2022 Revised : 15 February 2023 Accepted : 13 March 2023 Available online: 10 May 2023 Key Words: Biodiversity Flora Pteridophytes Invasive species Life form	The paper provides a floristic account of the S. R. T. Campus (HNB Garhwal University, Tehri Garhwal, Uttarakhand) which enumerates 193 taxa, distributed under 158 genera and 70 families of Angiosperms, Gymnosperms and Pteridophytes. Life form analysis revealed the presence of 65.28% herbs, 17.62 % shrubs 12.44 % trees, and. climber 4.66%. Asteraceae, Poaceae, Fabaceae, Lamiaceae, and Rosaceae revealed as the dominant families (in term of number of species) which together contributed 36.46% in the total species count. <i>Desmodium</i> with 4 species revealed as the dominant genus followed by <i>Carex</i>, <i>Solanum</i>, and <i>Indigofera</i> (3 species each). Of these, 17.13% species bears white flower, 15.47% yellow, 11.61% Pink, 9.94% green, blue 7.185.52 purple, 4.42% red while rest of the species (28.74%) bears flowers of other than colour class.

Introduction

The biodiversity of the Indian Himalayan Region (IHR) is being threatened by many natural as well as anthropogenic factors. The biodiversity in this region experienced some noticeable impacts, such as changes in species abundance and range, shifts in habitat and change in phenology (Gaur, 1999). Anthropogenic disturbances such as agricultural expansion, over grazing, habitat degradation, deforestation, forest fire and infrastructure development, may give a way to encroachment of invasive alien species, loss of pollinators, disease and pest out breaks (Pokhriyal *et al.*, 2012; Rawat *et al.*, 2016a, b, 2020; Kaushal *et al.*, 2021). The majority of rural households of the country depend on locally available natural resources to meet their daily needs especially fuelwood and fodder (Bhatt & Badoni, 1990). Floristic records, particularly from the Uttarakhand Himalaya and adjacent parts were attempted by a number of workers (Uniyal *et al.* 2007; Pusalkar and Srivastava, 2018). From the Garhwal Himalayan region of Uttarakhand, the floristic accounts are available in various forms e.g.

District Flora, Block Flora, Valley Flora, Forest Flora, and Flora of protected areas. Knowing the taxonomic and ecological implications plant diversity even in smaller semi-natural environment, several workers conducted floristic surveys in the different University Campuses of the country viz. Katoch *et al.* (2012; Jammu University Campus, Jammu & Kashmir), Ambrish *et al.* (2022; Dr. Y.S.P. University of Horticulture and Forestry Campus, Himachal Pradesh), Barik *et al.* (2023; North Orissa University Campus, Odisha), Kumari *et al.* (2023; Indira Gandhi National Open University (IGNOU) Campus, New Delhi), Saranya *et al.* (2023; Nehru Arts and Science College, Tamil Nadu), etc. S. R. T. campus of HNB Garhwal University (Badshahi Thaul, Tehri Garhwal, Uttarakhand) is has a good vegetation cover including both natural and planted floristic elements. Dangwal *et al.* (2011) surveyed the weeds of the campus and documented a total of 72 weed species belonging to 56 genera and 27 families. However, the complete floristic inventory

of the campus is not attempted by the earlier workers. Therefore, the present study aimed to provide a checklist of higher plants (Angiosperms, Gymnosperms and Pteridophytes) of the campus.

Material and Methods

Study area

The Swami Ram Teerth Campus (SRT Campus), one of the three campuses of the Hemvati Nandan Bahuguna Garhwal University (HNB Garhwal University), is located in the lap of Himalayan range in the Garhwal region of Uttarakhand. Administratively, it is situated at the Badshahi Thaul, block Chamba, district Tehri Garhwal, Uttarakhand at an altitude of ca. 1700 m asl. It is about 10 km from the new Tehri city (district Headquarters), 65 from the Rishikesh city while 90 km the Srinagar Garhwal (Main campus of HNB Garhwal University). Topographically the Badshahi Thaul area is undulating hilly. It is

representing lower montane to montane climatic condition. The weather remains pleasant throughout the year. The forests of the area are dominated by *Pinus roxburghii* on drier and exposed slopes while broad leaved species form mixed forests of shaded and moist slopes (especially along the streams). The study on the flora of the S. R. T. Campus (HNB Garhwal University, Uttarakhand) was carried out during 2020–2022. The plant specimens were collected in regular interval in different seasons from the vegetation cover area of the areas and its adjacent regions. Voucher specimens of all the plant species were collected and processed following conventional method (Jain & Rao, 1977). All the specimens were deposited in the Herbarium of Deptt. of Botany (Govt. P. G. College, New Tehri) after incorporating all the relevant field information for future records. An elaborated inventory of alien plants occur in these protected areas was prepared based on the fresh collections.

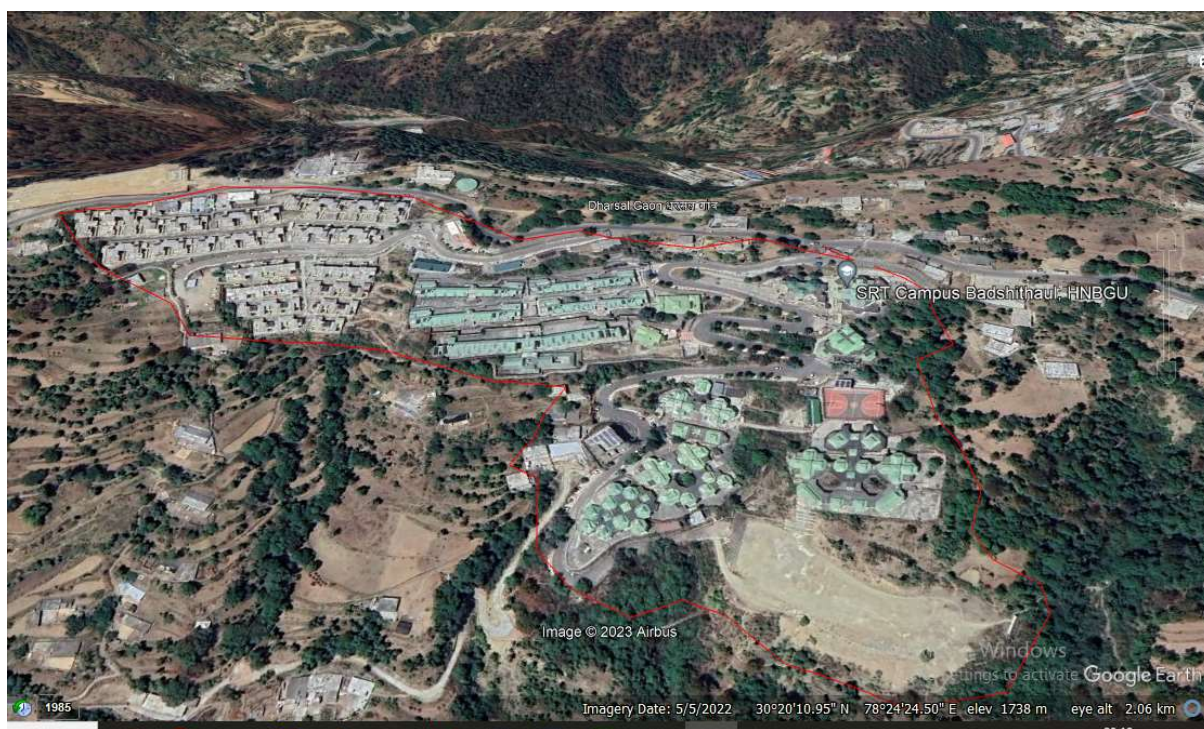


Figure 1. Site of the study, S. R. T. campus of HNB Garhwal University (Badshahi Thaul, Tehri Garhwal, Uttarakhand) (Source: Google Map)

Results and Discussion

The present floristic investigation in S. R. T. Campus (HNB Garhwal University, Tehri Garhwal, Uttarakhand) have resulted in the documentation of 193 plant species, distributed in 158 genera belonging to 70 families of Angiosperms, Gymnosperms and Pteridophytes (Table 1).

Appendix 1: List of floristic elements of S. R. T. Campus (HNB Garhwal University, Badshahi Thaul, Tehri Garhwal, Uttarakhand)

Name of family/ species	Habit	Period of Fl. & Fr.	Colour of flower
Dicotyledons			
Ranunculaceae			
<i>Anemone rivularis</i> Buch.-Ham. ex DC.	H	April-Aug.	White-purple
<i>Clematis grata</i> Wall.	CIS	July-Sept.	Creamy
<i>Clematis montana</i> Buch.-Ham. ex DC.	CIS	April-May	White
<i>Delphinium denudatum</i> Wall. ex Hook. f. & Th.	H	April-May	Blue
<i>Ranunculus diffusus</i> DC.	H	May-July	Yellow
Menispermaceae			
<i>Stephania elegans</i> Hook. f. & Th.	CIH	Aug.-Sept.	Purple
<i>Stephania glabra</i> (Roxb.) Miers.	CIS	July-Aug.	Greenish-yellow
Berberidaceae			
<i>Berberis asiatica</i> Roxb. ex DC.	S	Mar.-May	Yellow
<i>Berberis lycium</i> Royle	S	Mar.-May	Yellow
Brassicaceae			
<i>Cardamine impatiens</i> L.	H	Mar.-April	White
Violaceae			
<i>Viola pilosa</i> Blume	H	April-June	Pale-blue
<i>Viola serpens</i> Wall.	H	April-July	Liliac
Polygalaceae			
<i>Polygala chinensis</i> L.	H	Aug.-Sept.	Yellow
Caryophyllaceae			
<i>Stellaria media</i> (L.) Villars	H	Feb.-April	White
<i>Stellaria semivestita</i> Edgew. & Hook. f.	H	July-Aug.	White
<i>Vaccaria pyramidata</i> Medikus	H	April-May	Pink
Malvaceae			
<i>Sida cordata</i> (Burm. F.) Borss.	H	Sept.-Nov.	Pale-yellow
<i>Urena lobata</i> L.	S	July-Nov.	Pink
Tiliaceae			
<i>Grewia optiva</i> J.R. Drummond ex Burret	PIT	April-May	Yellow
<i>Triumfetta pilosa</i> Roth.	S	Sept.-Oct.	Yellow
Linaceae			
<i>Reinwardtia indica</i> Dumortier	H	Mar.-April	Yellow
Geraniaceae			
<i>Geranium nepalense</i> Sweet	H	May-Sept.	Purple
<i>Geranium ocellatum</i> Cambess.	H	Mar.-June	Pink
Oxalidaceae			
<i>Oxalis acetosella</i> L.	H	July-Sept.	Pink
<i>Oxalis corniculata</i> L.	H	July-Sept.	Pale-yellow
Balsaminaceae			
<i>Impatiens balsamina</i> L.	H	Aug.-Sept.	Pink
Rutaceae			
<i>Boenninghausenia albiflora</i> (Hook.) Reichb. ex Meisn.	H	July-Sept.	White
<i>Murraya koenigii</i> (L.) Sprengel	S	May-July	White
<i>Zanthoxylum armatum</i> DC.	S	April-May	Pale-yellow
Meliaceae			
<i>Cedrela serrata</i> Royle	T	May-June	Green-yellow
Celastraceae			
<i>Euonymus pendulus</i> Wall. ex Roxb.	T	May-June	Green
Vitaceae			
<i>Parthenocissus semicordata</i> (Wall.) Planch.	CIS	April-May	Yellowish-green
Aceraceae			
<i>Acer oblongum</i> Wall. Ex DC.	T	Mar.-April	White-green
Anacardiaceae			
<i>Rhus cotinus</i> L.	S	April-June	Purple
<i>Rhus parviflora</i> Roxb.	S	May-June	Yellowish-green
Coriariaceae			
<i>Coriaria nepalensis</i> Wall.	S	Mar.-April	Green
Papilionaceae			
<i>Astragalus leucocephalus</i> Graham ex Benth.	H	May-Aug.	Pale-yellow
<i>Astragalus trichocarpus</i> Grah.	H	May-Aug.	Pink
<i>Desmodium concinnum</i> DC.	S	Sept.-Feb.	Purple

<i>Desmodium laxiflorum</i> DC.	H	Sept.-Feb.	Pale-yellow
<i>Desmodium microphyllum</i> (Thunb.) DC.	S	July-Sept.	Purplish-brown
<i>Desmodium motorium</i> (Houtt.) Merr.	S	July-Sept.	Yellow
<i>Erythrina suberosa</i> Roxb.	T	Mar.-April	Red
<i>Indigofera atropurpurea</i> Buch.-Ham. ex Hornem	S	Mar.-May	Purple
<i>Indigofera dosua</i> Buch.-Ham. ex D.Don	S	May-June	Pinkish-purple
<i>Indigofera heterantha</i> Wall. ex Brandis	S	May-June	Pink-purple
<i>Smithia ciliata</i> Royle	H	July-Sept.	Blue-White
<i>Trifolium repens</i> L.	H	April-July	White-pink
Caesalpiniaceae			
<i>Bauhinia racemosa</i> L.	T	Sept.-Feb.	Pale-yellow
<i>Cassia gluca</i> Lamk.	PT	April-Aug.	Yellow
Mimosaceae			
<i>Albizia chinensis</i> (Osbeck) Merrill	T	May-June	Yellowish-white
Rosaceae			
<i>Agrimonia pilosa</i> Ledebour	H	July-Sept.	Yellow
<i>Cotoneaster affinis</i> Lindley	S	April-June	White
<i>Potentilla fragarioides</i> L.	H	July-Aug.	Yellow
<i>Prunus cerasoides</i> D.Don	T	April-May	Pink
<i>Pyrus pashia</i> Buch.-Ham. ex D.Don	T	Mar.-April	White
<i>Rubus ellipticus</i> Smith	S	Mar.-April	White
<i>Rubus niveus</i> Thunb.	S	Feb.-May	Pinkish-red
Saxifragaceae			
<i>Bergenia ciliata</i> (Royle) Raizada	H	Mar.-April	White-pink
Crassulaceae			
<i>Sedum multicaule</i> Wall. ex Lindley	H	July-Aug.	White-yellow
Melastomaceae			
<i>Osbeckia stellata</i> Wall. ex D.Don	S	Aug.-Sept.	Pink-purple
Lythraceae			
<i>Woodfordia fruticosa</i> (L.) Kurz	S	Feb.-May	Red
Punicaceae			
<i>Punica granatum</i> L.	T	April-May	Orange-red
Begoniaceae			
<i>Begonia picta</i> Smith	H	Aug.-Sept.	Pink
Apiaceae			
<i>Centella asiatica</i> (L.) Urban	H	May-June	Reddish-brown
Cornaceae			
<i>Benthamidia capitata</i> (Wall. ex Roxb.) Hara	T	April-Sept.	Yellowish-green
<i>Cornus macrophylla</i> Wallich	T	April-Oct.	Cream-white
Rubiaceae			
<i>Argostemma verticillatum</i> Wallich	H	July-Aug.	White
<i>Galium aparine</i> L.	H	July-Aug.	White
<i>Galium asperifolium</i> Wallich ex Roxb.	H	July-Aug.	Reddish-pink
<i>Randia tetrasperma</i> (Roxb.) Brand.	S	Mar.-April	Cream-yellow
<i>Rubia cordifolia</i> L.	CIH	July-Oct.	Red
Valerianaceae			
<i>Valeriana hardwickii</i> Wall.	H	July-Sept.	White-Pink
Asteraceae			
<i>Ageratum conyzoides</i> L.	H	Sept.	Pale-blue
<i>Ainsliaea aptera</i> DC.	H	Sept.	Pink-white
<i>Anaphalis busua</i> (Buch.-Ham. ex D.Don) DC.	H	Sept.-Oct.	White
<i>Artemisia capillaris</i> Thunb.	H	Sept.-Oct.	Greenish-yellow
<i>Bidens bipinnata</i> L.	H	July-Sept.	Yellow
<i>Conyza japonica</i> (Thunb.) Lessing ex DC.	H	April-Oct.	Pale-yellow
<i>Conyza stricta</i> Willd.	H	July-Aug.	Yellow
<i>Echinops niveus</i> Wallich ex Royle	H	Aug.-Sept.	Whitish-blue
<i>Erigeron alpinus</i> L.	H	June-Sept.	Purple-white
<i>Eupatorium glandulosum</i> H.B.K.	H	July-Sept.	Pale-white
<i>Gerbera gossypina</i> (Royle) G. Beauv.	H	May-Nov.	Pale-pink
<i>Inula cappa</i> (Buch.-Ham. ex D.Don) DC.	S	July-Oct.	Yellow
<i>Inula cuspidata</i> (DC.) C.B. Clarke	S	July-Oct.	Yellow
<i>Saussurea heteromalla</i> (D.Don) Hand-Mazz.	H	April-Aug.	Purple-red
<i>Senecio alatus</i> Wallich ex DC.	H	Aug.-Oct.	Yellow
<i>Tagetes erecta</i> L.	H	Aug.-Sept.	Red-yellow
<i>Tagetes minuta</i> L.	H	Aug.-Sept.	Pale-yellow

Floristic inventory of S. R. T. campus of HNB Garhwal University

<i>Taraxacum officinale</i> Weber	H	Mar.-Nov.	Yellow
<i>Xanthium strumarium</i> L.	H	April-Nov.	White
Ericaceae			
<i>Lyonia ovalifolia</i> (Wallich) Drude	T	April-May	White
<i>Rhododendron arboreum</i> Smith	T	Mar.-April	Red
Primulaceae			
<i>Anagallis arvensis</i> L.	H	April-May	Bluish-purple
<i>Primula floribunda</i> Wallich	H	Dec.-April	Yellow
Oleaceae			
<i>Jasminum humile</i> L.	S	May-June	Yellow
<i>Nyctanthes arbor-tristis</i> L.	T	Aug.-Oct.	Orange-white
Gentianaceae			
<i>Gentiana argentea</i> (D.Don) C.B. Clarke	CIH	April-May	Blue
<i>Swertia alata</i> (Royle ex D.Don) C.B. Clarke	H	Sept.-Oct.	Green-yellow
Boraginaceae			
<i>Cynoglossum glochidiatum</i> Wallich ex Benth.	H	June-Sept.	Blue
<i>Cynoglossum nervosum</i> Benth. ex Cl.	H	June-Sept.	Blue
Convolvulaceae			
<i>Ipomoea dichroa</i> (Romer & Schult.) Choisy	H	Aug.-Sept.	Pale-blue
<i>Ipomoea eriocarpa</i> R. Br.	H	Aug.-Sept.	Pink
Solanaceae			
<i>Datura stramonium</i> L.	S	July-Sept.	White
<i>Nicandra physalodes</i> (L.) Gaertner	H	July-Sept.	Pale-blue
<i>Solanum nigrum</i> L.	H	Aug.-Sept.	Blue
<i>Solanum surattense</i> Burm. f.	S	May-Oct.	White
<i>Solanum viarum</i> Dunal	S	July-Sept.	White
Scrophulariaceae			
<i>Bacopa procumbens</i> (Miller) Greenman	H	Aug.-Sept.	Pale-yellow
<i>Lindernia nummularifolia</i> (D.Don) Wettst.	H	Sept.-Oct.	Red-purple
<i>Verbascum thapsus</i> L.	H	May-Sept.	Yellow
<i>Veronica persica</i> Poiret	H	Sept.-Oct.	Blue
Gesneriaceae			
<i>Chirita bifolia</i> D.Don	H	July-Sept.	Purple-blue
Acanthaceae			
<i>Barleria cristata</i> L.	S	July-Nov.	Purplish
<i>Dicliptera roxburghiana</i> Nees	H	May-Dec.	Pink
<i>Lepidagathis incurva</i> Buch.-Ham. ex D.Don	S	Mar.-May	White
<i>Pteracanthus angustifrons</i> (Clarke) Brem.	S	Sept.-Dec.	Pale-purple
<i>Rostellularia japonica</i> Thunb.	H	July-Oct.	Pinkish-blue
Verbenaceae			
<i>Caryopteris grata</i> (Wallich) Benth.	S	Mar.-April	White
Lamiaceae			
<i>Ajuga lobata</i> D.Don.	H	Mar.-Oct.	Blue
<i>Ajuga parviflora</i> Benth.	H	Mar.-Oct.	Blue
<i>Leucas lanata</i> Benth.	H	July-Oct.	White
<i>Micromeria biflora</i> (Buch.-Ham. ex D.Don) Benth.	H	April-Oct.	Pink
<i>Nepeta graciliflora</i> Benth.	H	Oct.-Nov.	Pink
<i>Ocimum basilicum</i> L.	H	Sept.-Oct.	Pink-purple
<i>Origanum vulgare</i> L.	H	Aug.-Oct.	Pink
<i>Plectranthus striatus</i> Benth.	H	Aug.-Oct.	White
<i>Pogostemon benghalense</i> (Burm. f.) Kuntze	S	Jan-Feb.	White-pink
<i>Salvia mukerijeei</i> Bennett & Raizada	H	July-Oct.	Yellow
<i>Salvia nubicola</i> Wallich ex Sweet	H	Aug.-Oct.	Yellow
Nyctaginaceae			
<i>Boerhavia diffusa</i> L.	H	April-May	Pink
Amaranthaceae			
<i>Achyranthes aspera</i> L.	H	Sept.-Oct.	Pink
<i>Achyranthes betendifolia</i> L.	H	Sept.-Oct.	Pink
<i>Aerva scandens</i> Wallich	ST	Aug.-Sept.	White
<i>Alternanthera pungens</i> Humb.	H	Mar.-April	White
Polygonaceae			
<i>Polygonum capitatum</i> Buch.-Ham.	H	July-Aug.	Pink
<i>Polygonum nepalensis</i> (Meissn.) H. Gross	H	July-Oct.	Purple-pink
<i>Rumex hastatus</i> D.Don	H	Oct.-Nov.	Greenish-purple

<i>Rumex nepalensis</i> Sprengel	H	Oct.-Nov.	Greenish-red
Euphorbiaceae			
<i>Mallotus philippensis</i> (Lam.) Muell.-Arg.	T	Oct.-Nov.	Greenish-yellow
Urticaceae			
<i>Urtica parviflora</i> Roxb.	H	Aug.-Sept.	Green
Juglandaceae			
<i>Engelhardtia spicata</i> Leschenault ex Blume	T	Mar.-April	Green
<i>Juglans regia</i> L.	T	Mar.-May	Green
Myricaceae			
<i>Myrica esculenta</i> Buch.-Ham. ex D.Don	T	May-Dec.	Green
Fagaceae			
<i>Quercus leucotrichophora</i> A. Camus	T	April-May	Pale-green
Monocotyledons			
Ziniberaceae (Scitamineae)			
<i>Hedychium acuminatum</i> Roscoe	H	Aug.	Yellow
<i>Hedychium ellipticum</i> Buch.-Ham. ex Smith	H	Aug.	Crimson
<i>Roscoeia alpina</i> Royle	H	June-July	Dark-purple
<i>Roscoeia procera</i> Wallich	H	Aug.-Sept.	Lilac
Haemodoraceae			
<i>Ophiopogon intermedius</i> D.Don	H	July-Aug.	White
Dioscoreaceae			
<i>Dioscorea belophylla</i> (Prain) Voigt ex Hain.	TH	Aug.-Sept.	Pale-green
<i>Dioscorea bulbifera</i> L.	TH	July-Aug.	Pale-green
Liliaceae			
<i>Asparagus curillus</i> Buch.-Ham.	SS	Feb.-Oct.	White
<i>Asparagus gracilis</i> Royle	S	June-Aug.	White
Commelinaceae			
<i>Cyanotis cristata</i> (L.) D.Don	H	July-Sept.	Blue
Araceae			
<i>Arisaema flavum</i> (Forsk.) Schott.	H	June-July	Green-yellow
<i>Colocasia esculenta</i> (L.) Schott.	H	Aug.-Sept.	Pale-green
<i>Remusatia vivipara</i> (Roxb.) Schott.	H	May-July	Yellow-green
Cyperaceae			
<i>Carex condensata</i> Nees ex Wight	H	Sept.-Oct.	Brown
<i>Carex filicina</i> Nees ex Wight	H	Sept.-Oct.	Reddish-brown
<i>Carex setigera</i> D.Don	H	July-Sept.	Pale-brown
<i>Cyperus cuspidatus</i> H.B.K.	H	Sept.-Oct.	Reddish-yellow
<i>Cyperus niveus</i> Retz.	H	May-June	White
Poaceae (Gramineae)			
<i>Alloteropsis cimicina</i> (L.) Stapf.	H	Aug.-Sept.	White-green
<i>Apluda mutica</i> L.	H	Aug.-Sept.	Green
<i>Arundinella spathiflora</i> Trinius	H	Aug.-Sept.	Green
<i>Avena fatua</i> L.	H	June	Yellowish-green
<i>Brachiaria ramosa</i> (L.) Stapf.	H	Aug.-Sept.	Green
<i>Capillipedium assimile</i> (Steudel) A. Camus	H	Sept.-Oct.	Green
<i>Chrysopogon distans</i> W. Watson	H	Aug.-Sept.	Purple
<i>Cynodon dactylon</i> (L.) Persoon	H	May-Sept.	Green
<i>Digitaria biformis</i> Willd	H	Aug.-Sept.	Silvery-white
<i>Eragrostis poaeoides</i> P. Beauv.	H	Aug.-Sept.	Pale-green
<i>Microstegium nudum</i> (Trinius) A. Camus	H	Sept.-Oct.	Green
<i>Neyraudia arundinacea</i> (L.) Henrard	H	Sept.-Oct.	Pale-purple
<i>Oplismenus compositus</i> (L.) P. Beauv.	H	Aug.-Sept.	Green
<i>Saccharum bengalensis</i> Retz.	H	Sept.-Oct.	Pale-purple
<i>Setaria glauca</i> (L.) P. Beauv.	H	Sept.-Oct.	Yellow
<i>Sporobolus indicus</i> (L.) R. Br.	H	Sept.-Oct.	Green
<i>Tripogon filiformis</i> Nees ex Steud	H	Aug.-Sept.	Purplish-green
Gymnosperms			
Pinaceae			
<i>Cedrus deodara</i> (Royle ex D.Don) G.Don	PIT	Aug.-Nov.	-
<i>Pinus roxburghii</i> Sargent	T	Jan-June	-
Ferns			
Adiantaceae			
<i>Adiantum incisum</i> Forrk	Tf	-	-
<i>Adiantum venustum</i> D.Don	Tf	-	-

Aspidiaceae			
<i>Tectaria coadunata</i> (Wall. ex Hook. et. Grev.) C.Chr.	Tf	-	-
Athyriaceae			
<i>Athyrium pectinatum</i> (Wall. ex Mett.) Moore	Tf/Ep	-	-
<i>Athyrium schimperi</i> Moug. ex Fee	Tf/Ep	-	-
Cheilanthaceae			
<i>Cheilanthes farinosa</i> (Forsk) Kaulf	Tf	-	-
Dryopteridaceae			
<i>Dryopteris caroli-hopei</i> Fr.-Jenkins	Tf	-	-
<i>Polystichum squarrosum</i> (D.Don) Fee	Tf	-	-
Polypodiaceae			
<i>Microsorium membranaceum</i> (D.Don) Ching	Ep/Tf	-	-
<i>Polypodium microrhizoma</i> Clarke	Tf	-	-

Abbreviations used: H= Herb S= Shrub T= Tree PIT= Planted tree CIS= Climber shrub CIH= Climber herb TH= Twining herb Tf= Terrestrial fern Ep= Epiphytic fern.

Floristic details given in Appendix 1 include species and family, binomial, growth form, flowering and fruiting times and colour of flower. Of these, 10 species in 8 genera and 6 families belong to Pteridophytes (Ferns) and 181 species of angiosperms distributed over 148 genera and belonging to 63 families. Among them, the dicotyledonous flora represents 146 species from 120 genera belonging to 55 families and the monocotyledonous flora with 35 species from 28 genera belonging to 8 families. The Gymnosperms are represented only by 2 species.

Table 1: Statistical synopsis of floristic inventory of S. R. T. Campus, HNB Garhwal University, Tehri Garhwal

Plant group	Family	Genera	Species
Dicotyledons	55	120	146
Monocotyledons	8	28	35
Pteridophytes (Ferns)	6	8	10
Gymnosperms	1	2	2
Total	70	158	193

The family Asteraceae has the maximum number of species (19 species), followed by Poaceae (17 species), Fabaceae (12 species), Lamiaceae (11 species), Rosaceae (7 species), Acanthaceae, Cyperaceae Ranunculaceae, Rubiaceae and Solanaceae (5 species each) (Table 2). Some of the dominant genera in the area are *Desmodium* (4 species), *Carex*, *Solanum* and *Indigofera* (3 species each). The enumerated plants were classified into their respective growth forms viz., trees (natural and planted), shrubs (including under shrubs, woody parasites), herbs (vines, epiphytic herbs and ferns) and climbers (woody and non-woody) (Table 2). As per the type of growth form, 126 species

Table 2: Ten dominant families of the S. R. T. Campus

Family	Genera	Species
Asteraceae	16	19
Poaceae	17	17
Fabaceae	6	12
Lamiaceae	10	11
Rosaceae	6	7
Ranunculaceae	4	5
Rubiaceae	4	5
Solanaceae	3	5
Acanthaceae	5	5
Cyperaceae	2	5
Total	73	91

(65.28%) were herbs, 34 species (17.62%) were shrubs, 24 species (12.44 %) were trees and 9 species (4.66%) were climbers (Figure 2). Of these, 17.13% species bears white flower, 15.47% yellow, 11.61% Pink, 9.94% green, blue 7.18% purple, 4.42% red while rest of the species (28.74%) bears flowers of other than colour class (creamy, crimson, liliac, purplish, etc.).

A comprehensive and updated checklist on the floristic diversity of a area (including semi-natural environment) serve as a ready reference for researchers, policy makers and for better management and conservation of its indigenous species (Rawat *et al.*, 2016a). Thorough collection, identification and documentation of plants from any smaller eco-region is an essential step that evaluates the total biodiversity wealth of the district, state and country (Rawat *et al.*, 2016b). The S. R. T. Campus (HNB Garhwal University, Tehri Garhwal, Uttarakhand) is rich in natural floristic plant diversity however the current study and a previous

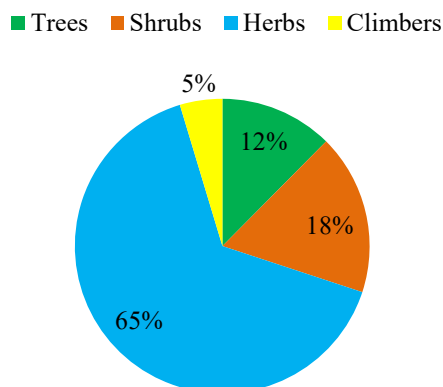


Figure 2: Habit-wise distribution of taxa in S. R. T. Campus

study (Dangwal *et al.*, 2011) revealed that the several invasive species have established themselves in within the campus and adjacent areas. Encroachment of several invasive alien species into uphill of Himalaya need matter to be concern, as some of the invasive species are able to

form large carpet of them on the land surface and change the natural habitats which may eradicate several habitat specific native species from the area (McGeoch *et al.*, 2010; Rawat *et al.*, 2016b). The garden worker may follow any of the four main suggested strategies (Syrett *et al.*, 2000) to control or eradicate invasive species (manual, mechanical, chemical and biological) in the campus area.

Acknowledgement

The authors would like to thank the Director (S. R. T. campus, HNBGU, Badshahi Thaul), HoD (Department of Botany S. R. T. campus, HNBGU, Badshahi Thaul) and HoD (Department of Botany, Govt. P. G. College, New Tehri) for extending facility. We are also grateful to the workers of the S. R. T. campus for their support and maintenance of immense plant diversity at the study site.

Conflict of interest

The authors declare that they have no conflict of interest.

References

- Ambrish, K., Dogra, K. S., Sharma, R. & Meena, B. (2022). Vegetation and floristic composition of Dr. Y.S.P. University of Horticulture and Forestry Campus, Solan, Himachal Pradesh. *Nelumbo*, 64(2), 24–31.
- Bagri, A. S., Singh, N. & Tiwari, P. 2023. A catalogue of the higher plants of the Adhwani temperate forest and its fringe areas (Western Himalaya, India). *Journal of Agriculture and Horticulture Research*, 6(1), 210–231.
- Barik, S., Parvez., Sahoo, P. P. & Mishra, A. K. (2023). A preliminary study on the lower and higher group of plants at North Orissa University campus Baripada, India. *Plant Archives*, 23(1), 253–261.
- Bhatt, B. P. & Badoni, A. K. (1990). Characteristics of some mountain firewood shrubs and trees. *Energy*, 15(11), 1069–1070.
- Dangwal, L. R., Sharma, A., Singh, A., Rana, C. S. & Singh, T. (2011). Weed flora of SRT campus Badshahi Thaul, Tehri Garhwal, (H.N.B. Garhwal Central University, Uttarakhand), India. *Pakistan Journal of Weed Science Research*, 17(4), 387–396.
- Gaur, R. D. (1999). *Flora of the District Garhwal: North West Himalaya (with Ethnobotanical Notes)*. Transmedia, Srinagar (Garhwal), Uttarakhand
- Jain, S. K. & Rao, R. R. (1976). *A Hand Book of Field and Herbarium Methods*. Today and Tomorrow's Printers and Publishers, New Delhi.
- Katoch, N. K., Thakur, S., Dutt, H. C., Bala, B. & Verma, M. (2022). Inventory of the Woody flora of Jammu University Campus, Jammu & Kashmir, India. *International Journal of Food and Nutritional Sciences*, 11(12), 1305–1322.
- Kaushal, S., Siwach, A. & Baishya, R. (2021). Diversity, regeneration, and anthropogenic disturbance in major Indian Central Himalayan forest types: implications for conservation. *Biodiversity and Conservation*, 30, 2451–2480.
- Kumari, A., Khuman, Y. S. C. & Nigam, A. (2023). Phytosociological Assessment of Vegetation at Indira Gandhi National Open University (IGNOU) Campus at New Delhi. *Sustainability, Agri, Food and Environmental Research*, 12, <http://dx.doi.org/10.7770/safer-V12N1-art2860>
- McGeoch, M. A., Butchart, S. H. M., Spear, D., Marais, E., Elizabeth, J., Kleynhans, A. S., Chanson, J. & Hoffmann, M. (2010). Global indicators of biological invasion: species numbers, biodiversity impact and policy responses. *Diversity and Distributions*, 16, 95–108.
- Patel, D., Prajapati, C., Barot, D. & Chaudhary, M. A. (2023). Floristic study of Angiospermic plants from MN College,

- Visnagar, Mehsana, (UG), India. *Life Sciences Leaflets*, 157, 1–19.
- Pokhriyal, P., Chauhan, D. S. & Todaria, N. P. (2012). Effect of altitude and disturbance on structure and species diversity of forest vegetation in a watershed of central Himalaya. *Tropical Ecology*, 53(3), 307–315.
- Pusalkar, P. K. & Srivastava, S. K. (2018). *Flora of Uttarakhand: Vol. 1: Gymnosperms and Angiosperms (Ranunculaceae-Moringaceae)*. Botanical Survey of India, Kolkata.
- Rawat, D. S., Tiwari, J. K. & Tiwari, P. (2016b). Invasive alien flora of western Ramganga Valley, Uttarakhand. *Phytotaxonomy*, 16, 111–114.
- Rawat, D. S., Tiwari, J. K., Tiwari, P. & Singh, H. (2016a). Floristic diversity of montane zone of western Ramganga valley, Uttarakhand, India. *The Journal of Economic and Taxonomic Botany*, 40(3–4), 104–125.
- Rawat, D. S., Tiwari, P., Das, S. K. & Tiwari, J. K. (2020). Tree species composition and diversity in montane forests of Garhwal Himalaya in relation to environmental and soil properties. *Journal of Mountain Science*, 17(12), 3097–3111.
- Saranya, N., Anirudhan, B., Kavimalar, S., Vinoth Kumar, V. & Sri Santhya, V. (2023). Campus survey on floristic biodiversity at Nehru Arts and Science College, Thirumalayampalayam, Coimbatore, Tamil Nadu, India. *International Journal of Research in Engineering and Science*, 11(4), 580–586.
- Singh, H., Hussian, J., Bagri, A. S., Rawat, V., Rawat, D. S. & Tiwari, J. K. (2022). Uses, preference, cultural importance and informant consensus factor of tree species in Uttarakhand: A case study from Bhilangna Watershed (Western Himalay, India). *Ecological Questions*, 33(3), 37–50.
- Syrett, P., Briese, D. T. & Hoffmann, J. H. (2000). Measures of success in biological control of terrestrial weeds by anthropods. In: *Measures of Success in Biological Control*, (Eds Wratten, S. D. & Gurr, G.), Kluwer, Amsterdam. pp. 189–230.
- Uniyal, B. P., Sharma, J. R., Chaudhari, U. & Singh, D. K. (2007). *Flowering Plants of Uttarakhand (A Checklist)*. Bishen Singh Mahendra Pal Singh, Dehradun.
- Publisher's Note:** ASEA remains neutral with regard to jurisdictional claims in published maps and figures.