



FLORAL DIVERSITY OF DARJEELING GOVERNMENT COLLEGE CAMPUS, DARJEELING, WEST BENGAL, INDIA

Norbu Sherpa¹, Lhamu Sherpa², Kishor Biswas³, *Chandan Naskar⁴

^{1,2,3,*4} Postgraduate Department of Botany, Darjeeling Government College, Darjeeling, (*Corresponding Author)

ABSTRACT

The paper deals with the floristic survey of Darjeeling Government College Campus. The study has revealed the occurrence of 204 species under 173 genera and 83 families growing naturally, including herbs (143spp), Shrubs (34spp) and Trees (27spp). Angiosperms are represented by 174spp, Gymnosperms by 8 spp and Pteridophytes by 22 spp.

KEYWORDS: Plant Diversity, DGC Campus, Checklist, Darjeeling.

INTRODUCTION

The District of Darjeeling covers an area of about 2436.55 km², lies between 26° 31' to 27° 13' N latitudes and between 87° 59' to 88°53' E longitudes (O'Malley 1999). The district is bordered by Sikkim in the north, Terai and Dooars in the south, Bhutan in the east and Nepal in the west. The altitudinal variation ranges from 150 m (at Sukna) to 3636m (at Sandakphu) presenting diverse topographical conditions (Das 1995, 2004; Acharya & Acharya 2001). The region is significantly rich in floral and faunal diversity.

Darjeeling Government College was established in 1948 and is situated in the lap of Birch Hill, the northern part of Darjeeling town, at an altitude of 2100 m AMSL. The campus covers an area of 12072 sq.mts. Nearly 60% of the total area of the campus has been contributed to the infrastructure; the remaining 40% is in the form of a small forest patch, a medicinal garden, and unused land. The study attempts to understand and document the campus flora with a comprehensive checklist.

MATERIAL AND METHODS

Several field surveys were made during the months of April 2021 to July 2022 covering all four major seasons and almost every corner of the campus within reach. The plants were photographed; specimens were collected, tagged, processed into mounted herbarium sheets following Jain & Rao (1977) and deposited in the Herbarium of Botany Department, Darjeeling Government College. Specimens were identified using various published literatures including Hooker (1875-1894), Beddome (1892), Bruhl (1926), Bir and Tirkha (1974), Grierson & Long, (1983, 84, 87, 91, 99, 2001), Rai (1990), Noltie (1994, 2000), Hara (1966, 71), Biswas (1966), Ohashi (1975), Matthew (1981), Das (1986), Bhujel (1996) and Iwatsuki (1988). The recorded angiosperms were assorted according to the Bentham and Hooker's System of Plant Classification (1862-1883), Gymnosperms according to Christenhusz et al. (2011) and Pteridophytes according to Smith et al. (2006).

RESULTS

Total numbers of 204 species of plants belonging to 173 genera and 83 families were recorded. Of these 174 species were angiosperm (142 species of dicots under 121 genera and 57 families; and 32 species of monocots under 27 genera and 10 families), 8 species were gymnosperms from 8 genera under 5 families and 22 species were Pteridophytes from 17 genera under 11 families. Majority of plants were found to be perennial accounting 155 species and 49 species were annuals. 152 species were terrestrial, 24 species were epiphytes and 28 species were recorded to be Chasmophyte. Herbs were found to be dominant in the area with 143 species in number, followed by the trees (34 species) and then shrubs (27 species).

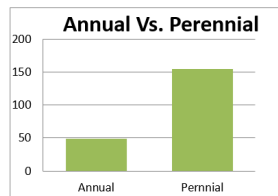
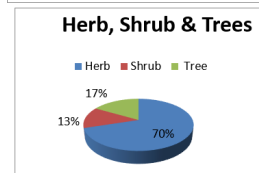
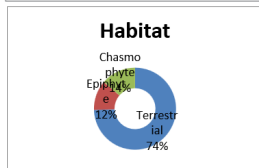
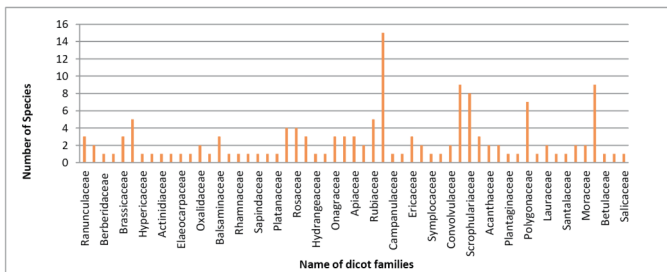
Table1: DICOTS

Sl No.	Name	Family	Ann	Per	H	S	T	Ter	Epi	Cha
1.	<i>Anemone polyanthes</i> D.Don	Ranunculaceae		+	+			+		
2.	<i>Anemone tetrasepala</i> Royle	Ranunculaceae		+	+			+		
3.	<i>Clematis buchanania</i> DC.	Ranunculaceae		+	+			+		
4.	<i>Magnolia cathartii</i> (Hook.f. & Thomson) Noot.	Magnoliaceae		+				+	+	

5.	<i>Magnolia doltsopa</i> (Buch.-Ham. Ex DC.) Figlar	Magnoliaceae						+	+	
6.	<i>Mahonia acanthifolia</i> D. Don	Berberidaceae						+	+	
7.	<i>Papaver macrostomum</i> Boiss. & A.Huet	Papaveraceae	+					+	+	
8.	<i>Brassica juncea</i> (Linn.) Czern.	Brassicaceae	+					+	+	
9.	<i>Capsella bursa-pastoris</i> (Linn.) Medik.	Brassicaceae	+					+	+	
10.	<i>Cardamine hirsuta</i> Linn.	Brassicaceae	+					+	+	
11.	<i>Cerastium glomeratum</i> Thuill.	Caryophyllaceae	+					+	+	
12.	<i>Drymaria cordata</i> (Linn.) Willd. Ex Schuld.	Caryophyllaceae	+					+	+	
13.	<i>Sagina japonica</i> (Sw.) Ohwi	Caryophyllaceae	+					+	+	
14.	<i>Stellaria media</i> (Linn.) Vill.	Caryophyllaceae	+					+	+	
15.	<i>Stellaria uliginosa</i> Murray	Caryophyllaceae	+					+	+	
16.	<i>Hypericum uralum</i> Buch.-Ham. ex D. Don	Hypericaceae						+	+	+
17.	<i>Camellia sasanqua</i> Thunb.	Theaceae						+	+	
18.	<i>Saurauia napaulensis</i> DC.	Actinidiaceae						+	+	
19.	<i>Abutilon pictum</i> (Gillius ex Hook.) Walp.	Malvaceae						+	+	
20.	<i>Elaeocarpus sikkimensis</i> Mast.	Elaeocarpaceae						+	+	
21.	<i>Geranium nepalense</i> Sweet	Geraniaceae						+	+	
22.	<i>Oxalis corniculata</i> Linn.	Oxalidaceae						+	+	
23.	<i>Oxalis latifolia</i> Kunth	Oxalidaceae						+	+	
24.	<i>Tropaeolum majus</i> Linn.	Tropaeolaceae						+	+	
25.	<i>Impatiens arguta</i> Hook.f. & Thomson	Balsaminaceae						+	+	
26.	<i>Impatiens graciliflora</i> Hook.f.	Balsaminaceae						+	+	
27.	<i>Impatiens racemosa</i> DC	Balsaminaceae						+	+	
28.	<i>Evodia fraxinifolia</i> (Hook.) Benth	Rutaceae						+	+	
29.	<i>Hovenia dulcis</i> Thunb.	Rhamnaceae						+	+	
30.	<i>Tetragium serrulatum</i> (Roxb.) Planch.	Vitaceae						+	+	
31.	<i>Acer laevigatum</i> Wall	Sapindaceae						+	+	
32.	<i>Rhus succedanea</i> Linn.	Anacardiaceae						+	+	
33.	<i>Platanus acerifolia</i> (Aiton) Willd.	Platanaceae						+	+	
34.	<i>Crotalaria cytosoides</i> DC	Leguminosae						+	+	
35.	<i>Erythrina arborescens</i> Roxb.	Leguminosae						+	+	
36.	<i>Parochetus communis</i> D.Don	Leguminosae						+	+	
37.	<i>Trifolium repens</i> Linn.	Leguminosae						+	+	
38.	<i>Duchesnea indica</i> (Jacks.) Focke	Rosaceae						+	+	
39.	<i>Eriobotrya petiolata</i> Hook.f.	Rosaceae						+	+	
40.	<i>Fragaria mucicola</i> (Lindl. Ex Hook.f.) Lacaite	Rosaceae						+	+	
41.	<i>Rubus ellipticus</i> Smith	Rosaceae						+	+	
42.	<i>Astilbe rivularis</i> Buch.-Ham. ex D. Don	Saxifragaceae						+	+	
43.	<i>Bergenia ciliata</i> (Haw.) Stemb.	Saxifragaceae						+	+	
44.	<i>Saxifraga stolonifera</i> L.f	Saxifragaceae						+	+	
45.	<i>Hydrangea heteromalla</i> D. Don	Hydrangeaceae						+	+	
46.	<i>Exbucklandia populnea</i> (R.Br. ex Griff.) R.W.Br.	Hamamelidaceae						+	+	
47.	<i>Fuchsia corymbiflora</i> Ruiz & Pav.	Onagraceae						+	+	
48.	<i>Fuchsia hybrida</i> hort. Ex Siebert & Voss	Onagraceae						+	+	
49.	<i>Fuchsia magellanica</i> Lam.	Onagraceae						+	+	
50.	<i>Edgaria darjeelingensis</i> C.B. Clarke	Cucurbitaceae						+	+	
51.	<i>Sechium edule</i> (Jacq.) Sw.	Cucurbitaceae						+	+	
52.	<i>Trichosanthes lepiniana</i> (Naudin) Cogn.	Cucurbitaceae						+	+	
53.	<i>Hydrocotyle javanica</i> Thunb.	Apiaceae						+	+	
54.	<i>Hydrocotyle sibthorpiodes</i> Lam.	Apiaceae						+	+	
55.	<i>Oenanthe thomsonii</i> C.B. Clarke	Apiaceae						+	+	

6.	<i>Dennstaedtia appendiculata</i> (Wall. ex Hook) J. Sm	Dennstaedtiaceae		+	+						+
7.	<i>Pteris wallichiana</i> J. Agardh	Pteridaceae		+	+				+		
8.	<i>Pteris quadriaurita</i> Retz.	Pteridaceae		+	+				+		
9.	<i>Cheilanthes formosana</i> Hayata	Pteridaceae		+	+						+
10.	<i>Vittaria flexuosa</i> Fee.	Pteridaceae		+	+						+
11.	<i>Asplenium ensiforme</i> Wall. ex Hook. & Grev.	Aspleniaceae		+	+						+
12.	<i>Asplenium yoshinagae</i> Makino.	Aspleniaceae		+	+						+
13.	<i>Deparia boryana</i> (Willd.) M. Kato.	Woodsiaceae		+	+					+	
14.	<i>Deparia petersenii</i> (Kunze) M. Kato.	Woodsiaceae		+	+					+	
15.	<i>Athyrium foliosum</i> T. Moore ex R. Sim.,	Woodsiaceae		+	+					+	
16.	<i>Thelypteris auriculata</i> (J. Sm.) K. Iwats	Thelypteridaceae		+	+					+	
17.	<i>Dryopteris juxtaposita</i> Christ.	Dryopteridaceae		+	+						+
18.	<i>Polystichum lentum</i> (D. Don) T. Moore.	Dryopteridaceae		+	+					+	
19.	<i>Oleandra wallichii</i> (Hook.) C. Presl	Oleandraceae		+	+						+
20.	<i>Lepisorus contortus</i> (Christ) Ching.	Polypodiaceae		+	+						+
21.	<i>Microsorium membranaceum</i> (D. Don) Ching.	Polypodiaceae		+	+						+
22.	<i>Polypodiodes lachnopus</i> (Wall. ex Hook.) Ching.	Polypodiaceae		+	+						+

Ann=Annual, Per=Perennial, H=Herb, S=Shrub, T=Tree, Ter=Terrestrial, Epi=Epiphyte, Cha=Chasmophyte



- Bir S.S and Tirkha C.K. (1974). Taxonomic revision of the Polypodiaceous genera of India-VI. *Lepisorus excavatus* group; *American Fern Journal* Vol. 64. Part 2.
- Biswas, K, (1966). Plants of Darjeeling and the Sikkim Himalayas, Vol. 1. Superintendent, Government Printing, West Bengal Government Press, Alipore, West Bengal.
- Bruhl, P. (1926). A Guide to the Orchids of Sikkim. Bishen Singh Mahendra Pal Singh, Dehradun, India.
- Christenhusz, J. M., Reveal, J. L., Farjon, A., Gardner, M. F., Mill, R. R. & Chase, M. W. (2011). A new classification and linear sequence of extant gymnosperms. *Phytotaxa* 19: 55–70.
- Das, A.P. (1986). On the floristic and palynological survey of Darjeeling and adjoining places. Ph.D. Thesis, Calcutta University, Kolkata.
- Das, A.P. (1995). Diversity of the angiospermic flora of Darjeeling Hills. In A.K. Pandey (ed.), *Taxonomy and Biodiversity*. CBS, New Delhi. Pp. 118–127.
- Das, A.P. (2004). Floristic studies in Darjiling hills. *Bulletin of Botanical Survey of India* 46(1–4): 1–18.
- Grierson, A.J.C. & Long, D.G. (1991–2001). *Flora of Bhutan*, Vol. 2 Part 1. Edinburgh.
- Grierson, A.J.C. & Long, D.G. (1983–1987). *Flora of Bhutan* Vol. parts 1–3. Edinburgh.
- Hara, H. (1966, 1971). *The Flora of Eastern Himalayas*, 1st & 2nd rep, University of Tokyo, Japan.
- Hooker, J.D. (1875–1894). *The Flora of British India*. Vol. 1–6. L. Reeve & Co. Ltd., London.
- Iwatsuki, K. (1988). An enumeration of the Pteridophytes of Nepal. In *The Himalayan plants* (Eds. H. Ohba and S.B. Malla), Univ. Tokyo Bull. 31: 231–339.
- Jain, S.K. & Rao, R.R. (1977). *Field and Herbarium methods*. Today and Tomorrow's Printers and publisher, New Delhi.
- Matthew, K. M. (1981). An Enumeration of the Flowering Plants of Kurseong, Darjeeling District West Bengal, India. Bishen Singh Mahendra Pal Singh, Dehra Dun, India.
- Noltie, H. J. (1994, 2000). *Flora of Bhutan*. Vol. 3 Parts 1–2. Edinburgh.
- O'Malley, L.S.S. (1907, Repr. 1999). *Bengal District Gazetteers Darjiling*. Logos Press, New Delhi, India.
- Ohashi, H. (1975). *The Flora of Eastern Himalaya*, 3rd Report. University of Tokyo press, Japan.
- Rai, L. K. (1990). *Trees of the Sikkim Hills: a guide to the identification of the species*. Sikkim Science society, Gangtok.
- Smith, A. R., Pryer, K. M., Schuettpetz, E., Korall, P., Schneider, H. & Wolf, P. G. (2006). A Classification for Extant ferns. *Taxon* 55(3): 705–731.

CONCLUSION

From the foregoing discussion it is very clear that Darjeeling Government College campus supports a huge number and diverse floral elements which serve as an essential tool for maintaining and enhancing the greenery and aesthetic value of the campus. But due to different developmental activities like recent construction of students' canteen building, dumping of trash and non-biodegradable garbage, concreting of guard wall from the front gate to the college building, as well as due to heavy storm felling down of some old trees which were host for numerous epiphytic and parasitic species, etc. posed a kind of threats to the flora of campus. Earlier a species of *Utricularia* grew with mosses on the mud wall along the main gate but now after construction of concrete wall this species was not recorded. The campus is the home for several orchid species and recently *Pleione praecox* and *Phalaenopsis taenialis* these two species become very scarce. So the authority should be aware and cautious enough to protect each and every species and components of campus flora to maintain the greenery and the ecosystem of the campus. The present study also suggests periodic assessment of flora and vegetation of the campus for better understanding of the changes in vegetation and for its effective conservation.

REFERENCES

- Acharya, K. & Acharya, R. (2001). *Cyathus* and *Geastrum*— An addition to Darjeeling mycoflora. *Indian Forester* 127: 959–952.
- Beddome, R. H. (1883–1892). *Handbook to the Ferns of British India: Ceylon and the Malay Peninsula*; with Supplement. Thacker, Spink, and Co., Calcutta, India. 1892.
- Bentham, G. & Hooker, J. D. (1862–1883). *Genera Plantarum ad exemplaria imprimis in herbariis Kewensibus servata*. Vol. 1–3. London.
- Bhujel, R.B. (1996). *Studies on the Dicotyledonous Flora of Darjeeling district*, Ph.D. Thesis, University of North Bengal, Siliguri.