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Documenting the Green Wealth of Tral: A Comprehensive Study of the Macroflora at Government Degree College Tral Campus

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Abstract: ***Studies on the macroflora of the campus of Government Degree College Tral (geographical coordinates 33.945682N/75.131888E west, 33.943771N/ 75.132538E south, 33.946626N/75.133959E east and 33.946924N/ 75.133118E north) was conducted between October 2022 and October 2023. The species were identified with the help of available floristic literature and comparison of the specimens in the herbarium of Centre for Plant Taxonomy (KASH), University of Kashmir. The angiosperms were arranged according to the classification of Takhtajan (2009). While gymnosperms, pteridophytes, bryophytes, fungi-lichens and alga were classified according to the classification of Sporne (1956), Reimers (1954), Prokauer (1957), Ainsworth and Bisby (2008) and Fritsch (1935) respectively. As many as 170 species (angiosperms 147) representing 143 (122 angiosperm) genera belonging to 63 families (46 angiosperm) were collected and identified. Among them 128 species were dicotyledonous and 19 were monocotyledonous. Besides these there were 4 gymnosperm, 3 pteridophytes, 5 bryophytes, 3 macrofungal, 7 lichen and 1 algal species. The dominant families in terms of number of species were Rosaceae (19), Asteraceae (15) and Poaceae (15). Most of the genus present were monospecific but some genera had more than one species. Some species incliding gymnosperms, ornamental and fruit bearing species had been deliberately introduced.***

Keywords: Tral, flora, biodiversity survey, plant taxonomy, Kashmir, plant species, campus vegetation

1. Introduction

Species diversity is one of the frequently measured aspects of biodiversity [1, 2]. The floristic studies which enlist the species diversity are considered as the backbone of the assessment of phytodiversity, conservation management and sustainable utilization [3]. The knowledge of biodiversity plays important role for the survival of future [4] and the floristic surveys are the only means by which we can achieve this goal [5]. A healthy ecosystem can be build when maintained in a sustainable manner [6] thus floristic wealth is an indispensable part of the natural balance that interprets the effects of the total environment [7]. The loss of biodiversity may alter the functioning of ecosystems [8]. Biodiversity education is very important to create interest, knowledge and necessary skills to solve biodiversity problems [9]. Biodiversity conservation is a critical environmental challenge, with accurate assessment being essential for conservation efforts [10]. Authentic identification, documentation and characterization of floras are of paramount importance for future studies that would help to formulate strategies for their management of biodiversity. The region of Kashmir (in which the present study was carried out) being at the crossroads of the Eurasian and Palaeotropical bio-realms, has been a crucible of floristic diversity [11] and hence warrant more attention in this regard. Keeping in view these facts, floristic studies (of macroflora) of the campus of Government Degree College Tral were carried out systematically between October 2022 to October 2023. The present study was an attempt to compile and enlist the macroscopic flora of the campus in order to spread the awareness about the available plant diversity and to prepare a sample study for future studies which was currently lacking.

Location and Geography

Government Degree College Tral (with an area of 96 kanals, about 5 hectares) was established in 1988 and shifted to the present location in year 2005. The geographic coordinates of the college include 33.945682N/75.131888E west, 33.943771N/ 75.132538E south, 33.946626N/75.133959E east and 33.946924N/ 75.133118E north (Fig. 1). The college is located about 2.5 Km from main town Tral in north-east direction, near Bajwani area of Tral. The campus is located on the gentle slope of the extension of the kerawa (plateau) on which Tral town is located. The kerawa is connected to the nearby extension of Zanskar mountain range of Himalayas. The campus has a mostly sandy loam soil with gravels and stones in the subsoil area. Of the total area, about 20% is built-up area. The remaining area of this college is occupied by natural vegetation, playground and patches of plantation maintained by Social Forestry Department, J&K Government. The average elevation of the campus is about 1700 metres above mean sea level. The annual mean highest (day temperature) temperature is 17.68 ºC and mean lowest (night temperature) temperature is 6.59 ºC (Fig. 2). The warmest month is July (average highest day temperature 29.1 ºC) and the coldest month is January (average lowest night temperature -4.2 ºC). The wettest month is March (with average monthly precipitation 49.41 mm) while the driest month is October (with average monthly precipitation 7.25 mm). The average annual number of days with precipitation (≥ 1.0 mm) are 49.47 days (13.55%). The average annual monthly precipitation is 33.85 mm (source: https://weatherandclimate.com/jammu-and-kashmir/tral).

Data Collection and Analysis

The task of documentation of the plant diversity of the campus was undertaken systematically and intensively from October 2022 to October 2023, to cover most species in flowering and fruiting stages and also to cover various

seasons. Field observations were made and the species were photographed. The species were identified using regional floras, relevant taxonomic work [10, 12, 14, 15], and with the help from Kashmir University Herbarium (KASH). Wherever needed, expert help was sought from Centre for Plant Taxonomy, Kashmir University, Srinagar. The collected materials were poisoned using standard herbarium techniques [4, 16]. The collected and identified species of angiosperms, gymnosperms, pteridophytes and mosses were completely pressed in a plant press after that they were dried and mounted on herbarium sheets. Fungal specimens were collected, preserved and identified following Leonard [17]) and Prance and Fechner [18]. The algal samples were collected, preserved and identified following Lehman [19] and Geer *et al*. [20], while for the lichen samples, the method devised by Singh *et al*. [21] was followed. Standard procedures were followed to avoid the damage to the specimens from various microorganism such as fungi, insects etc. The plant specimens (except fungal and algal specimens) were dried and affixed (along with a label) on a mounting sheets (28.72 cm X 4.25 cm dimensions). The air- dried specimens with voucher numbers were deposited at the herbarium of department of Botany, Govt. Degree College, Tral.

The plant species were enumerated and arranged as per the classification of Takhtajan [22] for angiosperms. While gymnosperms were arranged as per classification of Sporne [23]. Similarly pteridophytes, bryophytes, fungi (also lichens) and algae were arranged according to the classification of Reimers [24], Proskauer [25], Ainsworth and Bisby [26] and Fritsch [27] respectively. The nomenclature of the species was checked using resources like International Plant Names Index (IPNI) and TROPICOS (www.tropicos.org) website to ensure the correct spelling and attribution of the names.

2. Results

The present study documented a total of 170 species (Table 1) comprising of 147 angiosperms (Magnoliophyta), 4 gymnosperms, 3 pteridophytes, 5 bryophytes, 3 macrofungi, 7 lichens and 1 alga. Among the angiosperms 128 species belonged to Magnoliopsida (dicotyledons) and 19 to Liliopsida (monocotyledons). Among non-angiospermic species gymnosperms, pteridophytes, bryophytes, fungi, lichens and alga were represented by 4, 3, 5, 3, 7 and 1 species respectively. The angiosperms comprised of 46 families (42 Magnoliopsida and 4 Liliopsida). While non-angiospermic species comprised of 17 families: gymnosperms (2), pteridophytes (3), bryophytes (5), fungi (2), lichens (4) and alga (1). There were 122 genera of angiosperms, 4 of gymnosperms, 3 of pteridophytes, 5 of bryophytes, 3 of fungi, 5 of lichens and 1 of alga. Although most of the genera were represented by one species however there were 23 genera represented by more than one species which included: *Medicago* (3), *Prunus* (3), *Rubus* (3), *Sisymbrium* (3), *Artemesia* (2), *Digitaria* (2), *Euphorbia* (2), *Fragaria* (2), *Malva* (2), *Morus* (2), *Persicaria* (2), *Plantago* (2), *Poa* (2), *Polygonum* (2), *Poplus* (2), *Potentilla* (2), *Rosa* (2), *Rumex* (2), *Spiraea* (2), *Trifolium* (2), *Veronica* (2), *Ranunculus* (2), *Calopaca* (2) and *Xanthoria* (2). Among angiosperms Rosaceae was represented by 19 species; followed by Asteraceae (15), Poaceae (15), Fabaceae (10), Lamiaceae (7), Brassicaceae (6), Caryophyllaceae (6), Polygonaceae (6), Plantaginaceae (4), Apiaceae (3) Boraginaceae (3), Scrophulariaceae (3), Euphorbiaceae (2), Cannabaceae (2), Caprifoliaceae (2), Geraniaceae (2), Liliaceae (2), Malvaceae (2), Moraceae (2), Onagraceae (2), Papaveraceae (2), Ranunculaceae (2), Rubiaceae (2), Salicaceae (2), Saxifragaceae (2), Solanaceae (2), Amaranthaceae (1), Apocyanaceae (1), Asparagaceae (1), Balsaminaceae (1), Berberidaceae (1), Chenopodiaceae (1), Convolvulaceae (1), Cyperaceae (1), Fumariaceae (1), Magnoliaceae (1), Oleaceae (1), Oxalidaceae (1), Platanaceae (1), Portulacaceae (1), Primulaceae (1), Rhamnaceae (1) Simarubiaceae (1), Ulmaceae (1), Urticaceae (1), Verbenaceae (1), Violaceae (1) and Viscaceae (1). Similarly among angiosperms the largest order in terms of species was Rosales (19), followed by Lamiales (16), Asterales (15), Poales (15), Caryophyllales (9), Fabales (10), Capparales (6), Polygonales (6), Solanales (6), Urticales (6), Apiales (3), Papaverales (3), Rubiales (3), Dipsacales (2), Euphorbiales (2), Geraniales (2), Liliales (2), Malvales (2), Myrtales (2), Ranuncules (2), Salicales (2), Saxifragales (2), Asparigales (1), Balsaminales (1), Berberidales (1), Juncales (1), Magnoliales (1), Oxalidales (1), Platanales (1), Primulales (1), Rhamnales (1), Rutales (1), Santalales (1) and Violales (1). Gymnosperms were represented by two families (2 species of Cupressaceae and 2 of Pinaceae) and 2 orders (Cupressales and Coniferales). While pteridophytes with three families (and one order Polypodiales) of having one species each (Adiantaceae, Aspleniaceae and Dryopteridaceae). Similalrly bryophytes also comprised of 5 families (and 5 orders) with one species each (Dicranaceae, Funariaceae, Marchantiaceae, Mniaceae and Polytrichiaceae). Fungi were represented by two families (Tricholomataceae and Mycenaceae) and 1 order (Agaricales). Lichens were represented by four families viz. Pannariaceae (1 species), Parmeliaceae (1 species), Physciaceae (1 species) and Teloschistaceae (4 species). Former two belonged to the order Leconorales, while Physciaceae belonged to the order Caliciales; and the rest belonged to the order Teloschistales. Algae was represented by a single species (family Nostacaeae, order Nostacales).

Of all the species found, 19 species were trees and 15 were shrubs. The tree species included *Ailanthus altissimus, Cedrus deodara*, *Celtis australis*, *Cretaegus songarica*, *Cupressus sempervirens. Juglans regia*, *Magnolia liliiflora, Morus alba*, *M. nigra*, *Malus x domestica*, *Pinus wallichiana, Platanus orientalis*, *Populus deltoids, Populus nigra, Prunus armeniaca*, *P. persica*, *P. dulcis*, *Robinia pseudoacacia*, *Ulmus villosa*; while shrubs included *Berberis vulgaris*, *Forsythia suspensa*, *Indigofera heterantha, Lespedeza cuneata*, *Lonicera acquinuilaris*, *Philadelphus tomentosus, Platycladus orientalis*, *Rosa moschata*, *Rosa* x *damascena*, *Rubus plicatus*, *Rubus fruticosus*, *Sorberia tomentosa, Spiraea canescens*, *S. cantoniensis* and *Zizyphus jujba var. spinosa*. One of the species was epiphytic hemi-parasite (*Viscum album*). The lichens found were mostly corticolous while some were saxicolous. Most of the species were naturally grown and some of the trees and shrubs have been planted for the beautification of the campus to and to provide shade.

3. Discussion

In the present study overall 170 species of macroflora were identified in the campus, of them about 147 (86.47%) species were angiosperms. Among the angiosperms, 128 (87.07% were dicotyledons (Magnoliopsida) and 19 (12.93%) were monocotyledons (Liliopsida). The prevalence of angiosperms (and among them dicots) is an established fact within most of the land biomes [28, 29]. It is believed that smaller genomes permit the construction of smaller cells that allow for greater CO_2 uptake and photosynthetic carbon gain which have probably led dominance of angiosperms [30]. One explaination for the success of angiosperms is that they and their ancestors underwent many whole genome duplications and that this repeatedly stimulated their evolution [31-33]. Further, since angiosperms mostly rely on pollination for their reproduction and these agencies being numerous in number also probably contribute to their dominance. Among different plant families, Rosaceae family was the most prevalent in the number of species. This is partly because Rosaceae is primarily a temperate plant family [34] with lot of diversity and partly deliberate introduction of its species in the campus. High diversification rates associated with the families like Rosaceae increases species naturalization success [35]. After Roscaeae, Asteraceae and Poaceae had the highest number. These two families are among the most common and cosmopolitan plant families. Hodkinson [36] ascribes this attribute of family Poaceae to its ecological and evolutionarily success. The high global prevalence of Asteraceae is believed to be due it's capitulate inflorescence [37] with additional help from the secondary metabolites and the habit plasticity [38] which provides it the evolutionary success. Climatic or other geographic constraints also determine why a particular plant thrives in a particular setting, but many times, it is often far more complex (Ryan Pankau, https://extension.illinois.edu/blogs/garden-scoop). At the macroscale, climate strongly correlates with species richness gradients, resulting from differences in in-situ diversification and dispersal [39]. According to Kempel *et al*. [40] functional and life-history traits may also determine which species can successfully establish at a particular site. The nature of the relationship between plant diversity and microbial diversity also provides insights into the ecological drivers of community structure and function [41-44]. The diversity of plant community and soil microbial community has long been assumed to be closely related [41, 45-47]. Thus an array of factors [48-51] including human influence shaping floristic composition of any area. The gymnosperm species were solely deliberately planted for beautification purposes. The pteridophytes, bryophytes, fungi and algae were rare in distribution. Some species like *Drabopsis verna* and *Nostoc commune* were ephemeral species. The present study area in spite of being relatively smaller in size was rich in its floristic composition. The reason may be the sandy loam soil (as present in the campus) maintains better physicochemical parameters and more abundant beneficial microbes than clay soil as reported by Xu *et al*. [52] in one of their studies.

The classifications adapted in the present study were preffered because of their practicability. The usage of APNI and Tropicos.org for botanical nomenclature has many advantages [53] and naming correctly is very crucial while dealing with plants [54], so during present study the nomenclature adapted was based on these sources with other relevant support.

4. Conclusion

Even though the campus area is relatively smaller in size but still exhibited a good number of species. Among them as expected the angiosperms constituted a major portion of the macroflora. Families like Rosaceae, Asteraceae and Poaceae were dominant families. The gymnosperms, pteridophytes, bryophytes, macrofungi, lichens and macroalgae were fewer in number. Among the cryptogams gymnosperms were used for the beautification purposes while the rest of the species (except lichens) had restricted distribution within the campus. The total numbers of genera present were 143 among them the dominant genera in terms of the number of species were *Medicago*, *Prunus*, *Rubus* and *Sisymbrium* represented by 3 species. While 19 genera were represented by 2 species each. In spite of being relatively smaller in area the campus was rich in the number of species.

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[57] Index Fungorum: It is a community resource currently co-ordinated and supported by the Mycology Section of the Royal Botanic Gardens Kew and the Institute of Microbiology, Chinese Academy of Science.

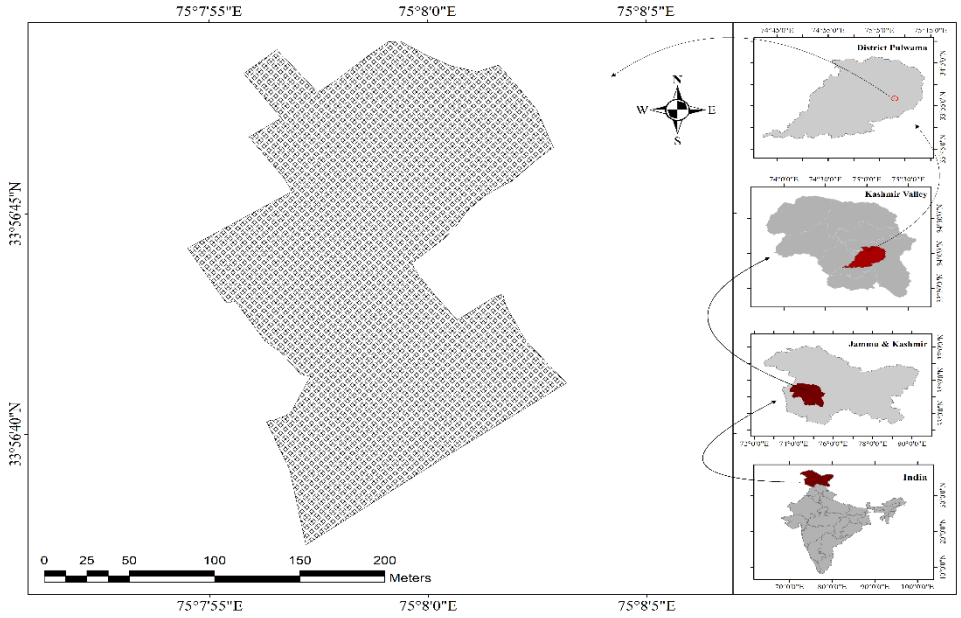

Figure 1: Location map of the study site

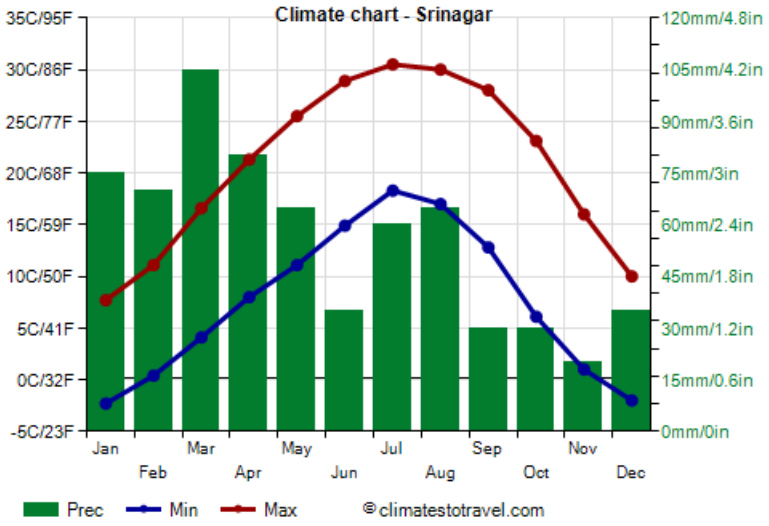

Figure 2: Precipitation average temperature pattern of the study site
(Source: https://www. climatestotravel.com/climate/india/srinagar)

Table 1: Species list on the study site

S. No.	Species	Family	Order	Super-oder	Subclass	Class
Angiosperms						
1.	*Cretaegus songarica* K. Koch 1853	Rosaceae	Rosales	Rosanae	Rosiidae	Magnoliopsida
2.	*Duchesnia indica* (Andrews) Tescham. 1835	Rosaceae	Rosales	Rosanae	Rosidae	Magnoliopsida
3.	*1Fragaria nubicola* (Hook. f.) Lindl. ex Lacaita 1916	Rosaceae	Rosales	Rosanae	Rosidae	Magnoliopsida
4.	*Fragaria vesca* L. 1753	Rosaceae	Rosales	Rosanae	Rosidae	Magnoliopsida
5.	*Geum urbanum* L. 1753	Rosaceae	Rosales	Rosanae	Rosidae	Magnoliopsida
6.	*Malus x domestica* Borkh. 1803	Rosaceae	Rosales	Rosanae	Rosidae	Magnoliopsida
7.	*Potentilla fulgens* Wall. ex Hook. 1826	Rosaceae	Rosales	Rosanae	Rosidae	Magnoliopsida
8.	*Potentilla supina* L. 1753	Rosaceae	Rosales	Rosanae	Rosidae	Magnoliopsida
9.	*Prunus armeniaca* L. 1753	Rosaceae	Rosales	Rosanae	Rosidae	Magnoliopsida
10.	*Prunus dulcis* (Mill.) D. A. Webb. 1967	Rosaceae	Rosales	Rosanae	Rosidae	Magnoliopsida
11.	*Prunus persica* (L.) Batsch 1801	Rosaceae	Rosales	Rosanae	Rosidae	Magnoliopsida
12.	*Rosa moschata* Mill. 1768	Rosaceae	Rosales	Rosanae	Rosidae	Magnoliopsida
13.	*Rosa* x *damascena* Mill. 1768	Rosaceae	Rosales	Rosanae	Rosiidae	Magnoliopsida
14.	*Rubus fruticosus* L. 1753	Rosaceae	Rosales	Rosanae	Rosidae	Magnoliopsida

15.	*Rubus plicatus* Weihe & Nees 1822	Rosaceae	Rosales	Rosanae	Rosidae	Magnoliopsida
16.	*Rubus ulmifolius* Schott 1818	Rosaceae	Rosales	Rosanae	Rosidae	Magnoliopsida
17.	*Sorberia tomentosa* (Lindl.) Rehder 1938	Rosaceae	Rosales	Rosanae	Rosaidae	Magnoliopsida
18.	*Spiraea canescens* D. Don 1825	Rosaceae	Rosales	Rosanae	Rosidae	Magnoliopsida
19.	*Spiraea cantoniensis* Lour. 1790	Rosaceae	Rosales	Rosanae	Rosidae	Magnoliopsida
20.	*Achillea millefolium* L. 1753	Asteraceae	Asterales	Asteridae	Asteridae	Magnoliopsida
21.	7*Artemisia annua* L. 1753	Asteraceae	Asterales	Asteridae	Asteridae	Magnoliopsida
22.	7*Artemisia absinthium L.* 1753	Asteraceae	Asterales	Asteridae	Asteridae	Magnoliopsida
23.	*Anthemis cotula* L. 1753	Asteraceae	Asterales	Asteridae	Asteridae	Magnoliopsida
24.	*Bidens pilosa* L. 1753	Asteraceae	Asterales	Asteridae	Asteridae	Magnoliopsida
25.	*Carthamus lanatus* L. 1753	Asteraceae	Asterales	Asteranae	Asteridae	Magnoliopsida
26.	*Cichorium intybus* L. 1753	Asteraceae	Asterales	Asteranae	Asteridae	Magnoliopsida
27.	*Crepis sancta* (L.) Bornm. 1913	Asteraceae	Asterales	Asteranae	Asteridae	Magnoliopsida
28.	*Dahlia pinnata* Cav. 1791	Asteraceae	Asterales	Asteridae	Asteridae	Magnoliopsida
29.	*Sonchus palustris* L. 1753	Asteraceae	Asterales	Asteranae	Asteridae	Magnoiliopsida
30.	*Tagetes erecta* L. 1753	Asteraceae	Asterales	Asteridae	Asteridae	Magnoliopsida
31.	*Conyza canadensis* (L.) Cronquist 1943	Asteraceae	Asterales	Asteridae	Asteridae	Magnoliopsida
32.	*Taraxacum officinale* F. W. Wigg. 1780	Asteraceae	Asterales	Asteridae	Asteridae	Magnoliopsida
33.	*Tragopogon dubius* Scop. 1772	Asteraceae	Asterales	Asteridae	Asteridae	Magnoliopsida
34.	*Xanthium spinosa* L. 1753	Asteraceae	Asterales	Asteridae	Asteridae	Magnoliopsida
35.	*Aegilops tauschii* Coss. 1849	Poaceae	Poales	Poanae	Commelinidae	Liliopsida
36.	*Bothriochloa ischaemum* (L.) Keng 1936	Poaceae	Poales	Poanae	Commelinidae	Liliopsida
37.	*Cynodon dactylon* (L.) Pers. 1805	Poaceae	Poales	Poanae	Commelinidae	Liliopsida
38.	*Dactylis glomerata* L. 1753	Poaceae	Poales	Poanae	Commelinidae	Liliopsida
39.	*Digitaria ciliaris* (Retz.) Koeler 1802	Poaceae	Poales	Poanae	Commelinidae	Liliopsida
40.	*Digitaria ischaemum* (Schreb.) Muhl. 1813	Poaceae	Poales	Poanae	Commelinidae	Liliopsida
41.	*Echinochloa crus-galli* (L.) P. Beauv. 1812	Poaceae	Poales	Poanae	Commelinidae	Liliopsida
42.	*Festuca arundinacea* Schreb. 1771	Poaceae	Poales	Poanae	Commelinidae	Liliopsida
43.	*Lolium perenne* L. 1753	Poaceae	Poales	Poanae	Commelinidae	Liliopsida
44.	*Oplismenus hirtellus* (L.) P. Beauv 1812	Poaceae	Poales	Poanae	Commelinidae	Liliopsida
45.	*Poa angustifolia* L. 1753	Poaceae	Poales	Poanae	Commelinidae	Liliopsida
46.	*Poa bulbosa* L. 1753	Poaceae	Poales	Poanae	Commelinidae	Liliopsida
47.	*Sorghum halepense* (L.) Pers. 1805	Poaceae	Poales	Poanae	Commelinidae	Liliopsida
48.	*Seteria virdis* (L.) P. Beauv. 1812	Poaceae	Poales	Poanae	Commelinidae	Liliopsida
49.	*Vulpia myuros* (L.) C.C. Gmel. 1805	Poaceae	Poales	Poanae	Commelinidae	Liliopsida
50.	*Indigofera heterantha* Wall. ex Brandis 1874	Fabaceae	Fabales	Fabanae	Rosidae	Magnoliopsida
51.	*Lespedeza cuneata* (Dum. Cours.) G. Don 1832 ^	Fabaceae	Fabales	Fabanae	Rosidae	Magnoliopsida
52.	*Lotus corniculatus* L. 1753	Fabaceae	Fabales	Fabanae	Rosidae	Magnoliopsida
53.	*Medicago lupulina* L. 1753	Fabaceae	Fabales	Fabanae	Rosidae	Magnoliopsida
54.	*Medicago minima* (L.) Bartal. 1776	Fabaceae	Fabales	Fabanae	Rosidae	Magnoliopsida
55.	*Medicago polymorpha* L. 1753	Fabaceae	Fabales	Fabanae	Rosidae	Magnoliopsida
56.	*Melilotus albus* Medik. 1787	Fabaceae	Fabales	Fabanae	Rosidae	Magnoliopsida
57.	*Robinia pseudoacacia* L. 1753	Fabaceae	Fabales	Fabanae	Rosidae	Magnoliopsida
58.	*Trifolium pratense* L. 1753	Fabaceae	Fabales	Fabanae	Rosidae	Magnoliopsida
59.	*Trifolium repens* L. 1753	Fabaceae	Fabales	Fabanae	Rosidae	Magnoliopsida
60.	*Lepidium didymum* L. 1767	Lamiaceae	Lamiales	Lamianae	Lamiidae	Magnoliopsida
61.	*Marrubium valgare* L. 1753	Lamiaceae	Lamiales	Lamianae	Lamidae	Magnoiopsida
62.	*Mentha piperata* L. 1753	Lamiaceae	Lamiales	Lamiinae	Lamiidae	Magnoliopsida
63.	*Nepeta cateria* L. 1753	Lamiaceae	Lamiales	Laminae	Lamiidae	Magnolopsida
64.	*Origanum vulgare* L. 1753	Lamiaceae	Lamiales	Lamianae	Lamiidae	Magnoliopsida
65.	*Salvia moorcraftiana* Wall. ex Benth. 1830	Lamiaceae	Lamiales	Laminae	Lamiidae	Magnoliopsida
66.	*Thymus serpyllum* L. 1753	Lamiaceae	Lamiales	Lamianae	Lamidae	Magnoliopsida
67.	*Capsella bursa-pastoris* (L.) Medik. 1792	Brassicaceae	Capparales	Malvanae	Dilleniidae	Magnoliopsida
68.	*Drabopsis verna* K. Koch 1841	Brassicaceae	Capparales	Malvanae	Dilleniidae	Magnoliopsida
69.	*Sisymbrium irio* L. 1753	Brassicaceae	Capparales	Malvanae	Dilleniidae	Magnoliopsida
70.	*Sisymbrium loeselii* L. 1753	Brassicaceae	Capparales	Malvanae	Dilleniidae	Magnoliopsida

71.	*Sisymbrium officinale* (L.) Scop. 1772	Brassicaceae	Capparales	Malvanae	Dilleniidae	Magnoliopsida
72.	*Cardamine hirsuta* L. 1753	Brassicaceae	Capparales	Malvanae	Dilleniidae	Magnoliopsida
73.	*Arenaria serpyllifolia L.* 1753	Caryophyllaceae	Caryophyllales	Caryophyllinae	Caryophyllidae	Magnoliopsida
74.	*Cerastium glomeratum* Thuill 1799	Caryophyllaceae	Caryophyllales	Caryophyllinae	Caryophyllidae	Magnoliopsida
75.	*Dianthus deltoids* L. 1753	Ca ryophyllaceae	Caryophyllales	Caryophyllanae	Caryophyllidae	Magnoliopsida
76.	*Holosteum umbellatum* L. 1753	Caryophyllaceae	Caryophyllales	Caryophyllinae	Caryophyllidae	Magnoliopsida
77.	*Lychnis coronaria* (L.) Desr. 1792	Caryophyllaceae	Caryophyllales	Caryophyllinae	Caryophyllidae	Magnoliopsida
78.	*Stellaria media* (L.) Vill.1789	Caryophyllaceae	Caryophyllales	Caryophyllinae	Caryophyllidae	Magnoliopsida
79.	*Persicaria nepalensis* (Meisn.) H. Gross 1913	Polygonaceae	Polygonales	Polygonanae	Caryophyllidae	Magnoliopsida
80.	*Persicaria maculosa* 1822	Polygonaceae	Polygonales	Polygonanae	Caryophyllidae	Magnoliopsida
81.	*Polygonum aviculare* L. 1753	Polygonaceae	Polygonales	Polygonanae	Caryophyllidae	Magnoliopsida
82.	*Polygonum hydropiper* L. 1753	Polygonaceae	Polygonales	Polygonanae	Caryophyllidae	Magnoliopsida
83.	*Rumex acetosa* L. 1753	Polygonaceae	Polygonales	Polygonanae	Caryophyllidae	Magnoliopsidas
84.	*Rumex crispus* L. 1753	Polygonaceae	Polygonales	Polygonanae	Caryophyllidae	Magnoliopsidas
85.	*Plantago lanceolata* L. 1753	Plantaginaceae	Lamiales	Lamianae	Lamiidae	Magnoliopsida
86.	*Plantago major* L. 1753	Plantaginaceae	Lamiales	Lamianae	Lamiidae	Magnoliopsida
87.	*Veronica arvensis* L. 1753	Plantaginaceae	Lamiales	Lamianae	Lamiidae	Magnoliopsida
88.	*Veronica persica* Poir. 1808	Plantaginaceae	Lamiales	Lamianae	Lamiidae	Magnoliopsida
89.	*Daucus carota* L. 1753	Apiaceae	Apiales	Cornanae	Asteridae	Magnoliopsida
90.	*Foeniculum vulgare* Mill. 1768	Apiaceae	Apiales	Cornanae	Asteridae	Magnoliopsida
91.	*Torilis japonica* (Houtt.) DC. 1830	Apiaceae	Apiales	Cornanae	Asteridae	Magnoliopsida
92.	*Lythospermum officinale* L. 1753	Boraginaceae	Lamiales	Laminae	Lamiidae	Magnoliopsida
93.	*Cynoglossum wallichi* G. Don 1837	Boraginaceae	Lamiales	Laminae	Lamiidae	Magnoliopsida
94.	*Myositis caespitosa* Schultz 1819	Boraginaceae	Lamiales	Laminae	Lamiidae	Magnoliopsida
95.	*Mazus japonicus* (Thunb.) Kuntze 1891	Scrophulariaceae	Solanales	Lamianae	Lamiidae	Magnoliopsida
96.	*Scrophularia himalensis* Royle ex Benth. 1835	Scrophulariaceae	Solanales	Lamianae	Lamiidae	Magnoliopsida
97.	*Verbascum thepsus* L. 1753	Scrophulariaceae3	Solanales	Lamianae	Lamiidae	Magnoliopsida
98.	*18Euphorbia helioscopia* L. 1753	Euphorbiaceae	Euphorbiales	Euphorbianae	Dilleniidae	Magnoliopsida
99.	*18Euphorbia prostata* Aiton 1789	Euphorbiaceae	Euphorbiales	Euphorbianae	Dilleniidae	Magnoliopsida
100.	*Cannabis sativa* L. 1753	Cannabaceae	Urticales	Hamamalidae	Hamamilididae	Magnoiopsida
101.	*Celtis australis* L. 1753	Cannabaceae	Urticales	Hamamalidae	Hamamilididae	Magnoiopsida
102.	*Lonicera acquinuilaris* Hardw. 1799	Caprifoliaceae	Dipsacales	Rhamnanae	Rosidae	Magnoliopsida
103.	*Valerianella dentata* (L.) Pollich, 1776	Caprifoliaceae	Dipsacales	Rhamnanae	Rosidae	Magnoliopsida
104.	*Erodium cicutarium* (L.) L'Her. ex Aiton 1789	Geraniaceae	Geraniales	Rutanae	Rosidae	Magnoliopsida
105.	*Scandix pectin-veneris* L. 1753	Geraniaceae	Geraniales	Rutanae	Rosidae	Magnoiliopsida
106.	*Colchicum luteum* Baker 1874	Liliaceae	Liliales	Lilianae	Liliidae	Liliopsida
107.	*Tulipa clusiana* Redoute 1803	Liliaceae	Liliales	Lilianae	Liliidae	Liliopsida
108.	*Malva neglecta* Wallr. 1824	Malvaceae	Malvales	Malvanae	Dilleniidae	Magnoliopsida
109.	*Malva sylvestris* L. 1753	Malvaceae	Malvales	Malvanae	Dilleniidae	Magnoliopsida
110.	*Morus alba* L. 1753	Moraceae	Urticales	Malvanae	Dillenanae	Magnoliopsida
111.	*Morus nigra* L. 1753	Moraceae	Urticales	Malvanae	Dillenanae	Magnoliopsida
112.	*Epilobium hirsutum* L. 1753	Onagraceae	Myrtales	Myrtanae	Rosidae	Magnoliopsida
113.	*Oenothera rosea* L'Her. ex Aiton 1789	Onagraceae	Myrtales	Myrtanae	Rosidae	Magnoliopsida
114.	*Eschscholzia californica* Cham. 1820	Papaveraceae	Papaverales	Ranunculanae	Ranunculidae	Magnoliopsida
115.	*Papaver rhoeas* L. 1753	Papaveraceae	Papaverales	Ranunculanae	Ranunculidae	Magnoliopsida
116.	*Ranunculus acris* L. 1753	Ranunculaceae	Ranunculales	Ranunculanae	Ranunculidae	Magnoliopsida
117.	*Ranunculus muricatus* L. 1753	Ranunculaceae	Ranunculales	Ranunculanae	Ranunculidae	Magnoliopsida
118.	*Glaium aparine* L. 1753	Rubiaceae	Rubiales	Lamianae	Lamiidae	Magnoliopsida
119.	*Rubia cordifolia* L. 1767	Rubiaceae	Rubiales	Lamianae	Lamiidae	Magnoliopsida
120.	*Populus deltoids* W. Bartram ex Marshall 1785	Salicaceae	Salicales	Violanae	Dillaniidae	Magnoliopsida
121.	*Populus nigra* L. 1753	Salicaceae	Salicales	Violanae	Dillaniidae	Magnoliopsida
122.	*Bergenia ciliata* Stemb. 1886	Saxifragaceae	Saxifragales	Rosanae	Rosidae	Magnoliopsida
123.	*Philadelphus tomentosus* Wall. ex G. Don 1832	Saxifragaceae	Saxifragales	Rosanae	Rosidae	Magnoiliopsida
124.	*Datura stramonium* L. 1753	Solanaceae	Solanales	Asteranae	Asteridae	Magnoliopsida
125.	*Solanum nigrum* L. 1753	Solanaceae	Solanales	Asteranae	Asteridae	Magnoliopsida
126.	*Amaranthus spinosus* L. 1753	Amaranthaceae	Caryophyllales	Caryophyllanae	Caryophyllidae	Magnoliopsida
127.	*Vinca major* L. 1753	Apocyanaceae	Rubiales	Lamianae	Lamiidae	Magnoliopsida
128.	*Ornithogallum umbalatum*	Asparagaceae	Asperagales	Lilianae	Liliidae	Liliopsida
129.	*Impatiens balfourii* Hook. f. 1903	Balsaminaceae	Balsaminales	Ericanae	Dilleniidae	Magnoliopsida
130.	*Berberis vulgaris* L. 1753	Berberidaceae	Berberidales	Ranunculanae	Ranunculidae	Magnoliopsida

131.	*Chenopodium album* L. 1753	Chenopodiacae	Caryophyllales	Caryophyllinae	Caryophyllidae	Magnoliopsida
132.	*Convolvulus arvensis* L. 1753	Convolvulaceae	Solanales	Asteranae	Asteridae	Magnoliopsida
133.	*Cyperus rotundus* L. 1753	Cyperaceae	Juncales	Juncanae	Commelinidae	Liliopsida
134.	*Fumaria indica* (Hausskn.) Pugsley 1919	Fumariaceae	Papaverales	Ranunculanae	Ranunculidae	Magnoliopsida
135.	*Magnolia liliiflora* Desr. 1792	Magnoliaceae	Magnoliales	Magnolianae	Magnoliidae	Magnoliopsida
136.	*Forsythia suspensa* (Thunb.) Vahl, Enum. Pl. [Vahl] 1804	Oleaceae	Lamiales	Lamianae	Lamiidae	Magnoliopsida
137.	*Oxalis corniculata* L. 1753	Oxalidaceae	Oxalidales	Rutanae	Rosidae	Magnoliopsida
138.	*Platanus orientalis* L. 1753	Platanaceae	Platanales	Proteanae	Ranunculidae	Magnoliaopsida
139.	*Portulaca oleracea* L. 1753	Portulaceae	Caryophyllales	Caryophillinae	Caryophyllidae	Magnoliopsida
140.	*Anagallis arvensis* L. 1753	Primulaceae	Primulales	Primulanae	Dilleniidae	Magnoliopsida
141.	*Zizyphus jujba var. spinosa* (Bunge) H.H. Hu ex H.F. Chow 1934	Rhamnaceae	Rhmanales	Rhamnane	Rosidae	Magnoiliopsida
142.	*Ailanthus altissimus* (Mill.) Swingle 1916	Simaroubaceae	Rutales	Rutanae	Rosidae	Magnoliopsida
143.	*Ulmus villosa* Brandis ex Gamble 1902	Ulmaceae	Urticales	Malvanae	Dilleniidae	Magnoliopsida
144.	*Urtica dioca* L. 1753	Urticaceae	Urticales	Malvanae	Dilleniidae	Magnoliopsida
145.	*Verbena officinalis* L. 1753	Verbenaceae	Lamiales	Lamianae	Lamiidae	Magnoliopsida
146.	*Viola odorata* L.1753	Violaceae	Violales	Violanae	Dillenianae	Magnoliopsida
147.	*Viscum album* L. 1753	Viscaceae	Santalales	Santalanae	Rosidae	Magnoliopsida
	Gymnosperms					
148.	*Cedrus deodara* (Roxb. ex D. Don) G. Don 1830	Pinaceae	Coniferales			Conferopsida
149.	*Pinus walchiana* A. B. Jacks 1938	Pinaceae	Coniferales			Coniferopsida e)
150.	*Cupressus sempervirens* L. 1753	Cupressaceae	Cupressales			Coniferopsida
151.	*Platycladus orientalis* (L.) Franco 1949	Cupressaceae	Cupressales			Coniferopsida
	Pteridophyta					
152.	*Adiantum capillus-veneris* L. 1753	Adiantaceae	Polypodiales			Pteropsida
153.	*Asplenium trichomanes* L. 1753	Aspleniaceae	Polypodiales			Pteropsida
154.	*Dryopteris blanfordii* (C. Hope) C. Chr. 1905	Dryopteidaceae	Polypodiales			Pteropsida
	Bryophyta					
155.	*Funaria hygrometrica* Hedw. 1801	Funariaceae	Funariales			Bryopsida
156.	*Leucobryum glaucum* (Hedw.) Angstr. 1845	Dicranaceae	Dicranales			Bryopsida
157.	*Marchantia polymorpha* L. 1753	Marchantiaceae	Marchantiales			Hepaticopsida
158.	*Mnium rostratum* Schrad. 1802	Mniaceae	Bryales			Bryopsida
159.	*Polytrichum commune* Hedw. 1801	Polytrichaceae	Polytrichales			Bryopsida
	Fungi					
160.	*Mycena alcalina* (Fr.) P. Kumm. 1871	Mycenaceae	Agaricales			Basidiomycetes)
161.	*Collybia earleae* (Murrill) Murrill, 1916	Tricholomataceae	Agaricales			Basidiomycetes
162.	*Leucopaxillus pseudoacerbus* (Costantin & L.M.Dufour) Boursier 1925	Tricholomataceae	Agaricales			Basidiomycete
	Lichens					
163.	*Pannaria lurida* Nyl 1858	Pannariaceae	Lecanorales			Ascomycetes
164.	*Flavoparmelia caperata* (L.) Hale 1986	Parmeliaceae	Lecanorales			Ascomycetes
165.	*Hyperphyscia syncolla* (Tuck. ex Nyl.) Kalb. 1983	Physciaceae.	Caliciales			Ascomycetes
166.	*Calopaca saxicola* (Hoffm.) Nordin 1972	Teloschistaceae	Teloschistales			Ascomycetes
167.	*Calopaca marina* (Wedd.) Zahlbr. 1921	Teloschistaceae	Teloschistales			Ascomycetes
168.	*Xanthoria parietina* (L.) Th. Fr. 1860	Teloschistaceae	Teloschistales			Ascomycetes
169.	*Xanthoria polycarpa* (Hoffm.) Rieber, 1891	Teloschistaceae	Teloschistales			Ascomycetes
	Algae					
170	*Nostoc commune* Vaucher ex Bornet & Flahault 1886	Nostocaceae	Nostocales			Cynophyceae