



Diversity and distribution of flora and fauna in V. G. Shivdare Campus, Solapur, India

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Abstract

The study was conducted to document the diversity and distribution of flora and fauna in and around V.G.S campus in Solapur city, Maharashtra, India in year 2019-20. The campus area is 20234.3 square meters which is divided into 4 zones according to campus location and area. The plant specimens were collected for identification and documentation from different zones. 35 different families with 71 species of plants (19 species of trees, 31 species of shrubs, 11 species of herbs and 10 species of grasses) were recorded. The families namely Fabaceae, Poaceae, Apocynaceae, Asparagaceae are dominated. In these Fabaceae topped the list with 11 Genus followed by Poaceae with 10 genus. The study also records 05 species of reptiles, 11 species of birds, 25 species of insect's. The distribution and availability of individual flora and fauna species has been scrutinized carefully for its future sustainable utilization. The present study found that campus area having different types of biodiversity along with maximum shrub, medicinal and ornamental plants. These vegetation data will be required to support a wide variety of resource assessment, management, and conservation concerns.

Key words: V.G.S campus, flora and fauna, environmental conservation

1. Introduction

Biodiversity describes the richness and variety of life on earth. It includes the number of different organisms and their relative frequencies in an ecosystem. A healthy ecosystem can be build when we maintained in a sustainable manner (Berhanu Abraha et.al. 2006). The loss of biodiversity may alter the functioning of ecosystems (Bradley J Cardinale et.al. 2012). Flora and fauna are very important for human existence. The flora releases oxygen which is taken by the fauna for respiratory purposes. In return, the fauna releases carbon dioxide required by the flora for photosynthesis. In nature, plant species are part of community of species populations living together in the same area. The overall appearance of the vegetation is called physiognomy (Kuchler and Zonneveld 1988) which describes the features of the vegetation, such as the growth forms, life form of dominant species within a plant community. Biodiversity education is very important to create interest, knowledge and necessary skills in students to solve biodiversity problems (Alexandar Ramadoss, 2011). 50 species are being extinct every year, due to human interference in tropical forest (Alok Kumar Chandrakar, 2012). There are hundreds of species of animals throughout the world which are fast disappearing because of human interference in their natural habitat. So conservation of biodiversity is necessary for our present and future sustainable development. Loss of natural habitat and land cleaning are major threats to loss of reptile diversity (Wenny Saptalisa, 2015).

It is necessary to maintain green vegetation in the campus for oxygen saturation for healthy life of students. The study of flora and fauna help to conserve the biodiversity with the help of green belt (Jogattappa Narayana et.al, 2017). For preservation of floral biodiversity, it is very important to set up a botanical garden in the college campus and cultivate these plants, and also protect the naturally grown plants on the grounds (C.K. Renukarya et.al, 2015). Beneficial insects are important for soil formation, biological control of pests, nutrient cycling and pollination of plants (Baltazar Ndakidemi, 2016). Green campuses can also support endemic/threatened/locally rare species in small amount and thus can also serve as centers for conservation (Ashish Nerlekar et.al, 2016). Residential landscapes with private gardens are a major land cover in many cities, are beneficial for bird conservation and enhance human experiences with wildlife (Mark A Goddard, 2017).

The present study was carried out in V. G. Shivdare college of Biotechnology, Solapur, Maharashtra for academic year 2019-20. The district of Solapur lies between 17°10' N - 18°32' N and 74°42' E - 76°15' E. The rainfall in the district varies from 448.8 mm (17.67")

to 689.2 mm (27.14"). The whole district experiences extremes of climate with temperature rising up to 45° C in summer season. The climate of the region supports the vegetation that can be thorny forests, tropical dry deciduous forests, and vast tracts of grasslands. The land is drought-prone and semi-arid and it is in the Deccan thorn scrub forests eco region. The Sanctuary for the great Indian bustard (*Ardeotis nigriceps*) is situated in Solapur (1,222 sq km). But the sanctuary is facing severe habitat loss and degradation, lack of protection to habitat posing a threat to its biodiversity (Jayanthi Janakiraman et.al, 2015). The grasslands of the district are unique and it is known as Indian Savannas, which is famous for bird diversity. A hundreds of bird species including a critically endangered Indian Bustard (*Ardeotis nigriceps*) inhabit in these grasslands. It comprises systematic account of 1441 species belonging to 694 genera and 143 families of flowering plants (S. P. Gaikwad et.al, 2015). The arboreal flora of corporation is mostly of cultivated tree species and a very few number belongs from wild tree species (Rajendra Suryavanshi 2011).

2. Objective of study

- To document the herbs, shrub and tree species present in the campus
- To check abundance of a particular plant family
- To enumerate the fauna types sheltered in the vegetation of the campus.
- To identify the plant species and their importance for environmental conservation.

3. Material and methods

- Study of region

The V. G. Shivdare College is located in Solapur city, Maharashtra, India. The Geographical position of the study area is with latitude 17.647500 and longitude 75.900110. The V. G. Shivdare College has been learning institution for more than 15 years in Solapur city. This college is recognised for its infrastructure and land scape. The total area of campus is 20234.3 square meter with natural and cultivated habitat. The climate of study area is healthy, fresh moderately cool because of vegetation covers in the campus. The maximum area of campus is covered by plants, herbs, shrubs and lawn which increase aesthetic value of college.

Study region is divided into 4 zones according to area of campus

Zone A: Parking area

Zone B: Department of Biotechnology

Zone C: Unique school area

Zone D: Pharmacy area

- Sampling of flora

The primary goal of vegetation surveys is to characterize as many vegetation patterns as possible within the study area. Samplings are done by random sampling method and by square type quadrat method. A 2-D square shaped grid was prepared as a sampling unit. The choice of dimensions and shape of the quadrat was affect the accuracy and precision of the parameter. 10m×10m quadrates were placed in each locality and counted the number of shrubs, herbs, and grass. A tape was also used for measurement on the ground, where grid measurements was not possible. Plants were recorded and identified with the help of expert botanist.

- Trees: The trees in the zones were measured by direct counting using census method.
- Herbs, shrubs, grass the study were carried out using 10m×10m grid method.
- The floras outside the grid were also listed for frequency occurrence.

Sampling of fauna

Survey of birds, reptiles and insects in the campus were done by direct observation during the study period and recorded. Different types of birds were visited to campus in different seasons. Mostly seasonal birds are observed during study period during early hours and evening hours of the day. The diversity was recorded and identified using standard book.

4. Discussion

The quadrat study was conducted to calculate the number of trees in the area. Most of the area encroached in the study is dominated by trees and supports biodiversity. In the present study the field observation data indicates that total of 71 species of plants belonging to 35 different families. The plant diversity shows the following families namely Fabaceae, Poaceae, Apocynaceae, Asparagaceae are dominated. In these Fabaceae topped the list with 11 Genus followed by Poaceae with 10 genus. Among the recorded quadrat information, tree species dominated around the study area with dry deciduous habitat. Similar Plants such as *Leucaena leucocephala* and *Ficus microcarpa* species are top canopy trees present in abundant number. In case of herbs *Calystegia hederacea*, *Aeschynomene indica* are dominant and shrubs *Podranea ricasoliana*, *Caesalpinia pulcherrima* and *Jasminum* plants are maximum in number.

Total 17 species of trees, 28 species of shrubs, 11 species of herbs and 5 species of grasses were recorded. The study also records 10 species of reptiles, 11 species of birds, 25 species of insects. Among reptiles, garden lizard, rock lizard and tree lizards are commonly distributed. 11 species of birds were recorded, in which, Sparrows, Parrot, Crows, woodpecker were common. Among insects, Grasshoppers, Centipedes, Millipedes, Bagworms, Red ants, honey bees and house cricket were dominating. Spiders, Termites, Wasps were distributed in large numbers in the campus.

5. Conclusion

The V. G. Shirdare College is recognized for its infrastructure and land scape due to its natural vegetation and plantation in campus. Most of the plant species have multiple uses and importance which protect the ecosystem from degradation. The present study concludes that The V. G. Shirdare College supports rich floral and faunal diversity as well as exotic species of plants for aesthetic, social and decorative purpose. This type of floral study is very essential to know the economic and environmental importance of plants. The undisturbed status of biodiversity in campus was clearly evidenced with well regeneration capacity of the species. The biodiversity of campus also support green campus concept.

Herbs in campus

SR. NO.	Common name of plant	Scientific name of plants	Name of family	Zones				Total no. of plants
				A	B	C	D	
1.	Bishops weed	<i>Aegopodium podgraria</i>	Apiaceae	03	07	00	05	15
2.	Basil	<i>Ocimum basilicum</i>	Lamiaceae	15	7	12	08	42
3.	Canna Indica	<i>Sierra Leone arrowroot</i>	Cannaceae	10	06	10	09	35
4.	Lemon grass	<i>Cymbopogon</i>	Poaceae	11	06	05	08	30
5.	Peppermint	<i>Mentha balsamea</i>	Lamiaceae	15	06	08	05	34
6.	Spiny amaranth	<i>Amaranthus spinosus</i>	Amaranthaceae	20	10	08	08	46
7.	Japanese false bindweed	<i>Calystegia hederacea</i>	Convolvulaceae	25	28	18	11	82
8.	Indian jointvectch	<i>Aeschynomene indica</i>	Fabaceae	22	19	12	07	60
9.	coat button plant	<i>Tridax procumbens</i>	Asteraceae	16	12	14	08	50
10.	Shame plant	<i>Mimosa pudica</i>	Fabaceae	11	18	14	15	58
11.	Catherdral bell plant	<i>Bryophyllum pinnatum</i>	Crassulaceae	20	11	14	16	51

Shrubs in campus

Sr. No.	Common name of plant	Scientific name of plants	Name of family	Zones				Total no. of plants
				A	B	C	D	
1	Copper leaf	<i>Acalypha wilkesiana</i>	<u>Euphorbiaceae</u>	07	12	26	42	87
2	Oleander	<i>Nerium oleander</i>	<u>Apocynaceae</u>	12	28	12	16	68
3	Chinese hibiscus	<u>Hibiscus Rosa sinensis</u>	<u>Malvaceae</u>	20	18	16	21	75
4	Adulasa	<i>Justicia adhatoda</i>	<u>Acanthaceae</u>	12	18	13	11	54
5	Pink trumpet vine	<u>Podranea ricasoliana</u>	<u>Bignoniaceae</u>	22	26	31	13	92
6	Fire bush	<u>Hamelia patens</u>	<u>Rubiaceae</u>	09	08	11	06	34
7	Mexico locust	<u>Robinia neomexicana</u>	<u>Fabaceae</u>	05	06	04	02	17
8	Peacock flower	<u>Caesalpinia pulcherrima</u>	<u>Fabaceae</u>	32	28	20	08	88
9	Yellow oleander	<u>Cascabela thevetia</u>	<u>Apocynaceae</u>	06	05	06	08	25
10	Yellow trumpet bush	<u>Tecoma stans</u>	<u>Bignoniaceae</u>	04	02	03	04	13
11	Flame of woods	<u>Lxora coccinea</u>	<u>Rubiaceae</u>	03	02	03	06	14
12	Japanese spindle	<u>Euonymus japonicus</u>	<u>Celastraceae</u>	04	06	00	03	13
13	Ashwaghandha	<u>Withania somnifera</u>	<u>Solanaceae</u>	06	08	05	06	25
14	Jasmin	<u>Jasminum</u>	<u>Oleaceae</u>	09	27	13	27	76
15	Beet	<u>Beta vulgaris</u>	<u>Amaranthaceae</u>	02	05	03	04	14
16	Rose	<u>Rosa</u>	<u>Rosaceae</u>	13	18	16	08	55
17	Narrow leaf zinnia	<u>Zinnia angustifolia</u>	<u>Asteraceae</u>	01	02	00	02	05
18	Nishigandha	<i>Polianthes tuberosa</i>	<u>Asparagaceae</u>	02	02	00	03	07
19	Aloe Vera	<i>Aloe barbadensis miller</i>	<u>Asphodelaceae</u>	06	07	04	04	21
20	Henna	<u>Lawsonia inermis</u>	<u>Lythraceae</u>	01	03	00	00	04
21	Passion fruit	<u>Passiflora edulis</u>	<u>Passifloraceae</u>	01	01	00	00	02
22	Ajuwian	<i>Trachyspermum ammi</i>	<u>Apiaceae</u>	02	00	02	01	05
23	Shatavari	<i>Asparagus racemosus</i>	<u>Asparagaceae</u>	01	01	00	02	04
24	Cactus	<i>Cactaceae</i>	<i>Cactaceae</i>	00	00	02	01	03
25	Beech wood	<i>Fagus</i>	<u>Fagaceae</u>	00	00	01	01	02
26	Vinca rosea	<i>Catharanthus roseus</i>	<u>Apocynaceae</u>	08	08	10	08	34
27	Guduchi	<i>Tinospora cordifolia</i>	<u>Menispermaceae</u>	01	02	02	03	08
28	Life plant	<u>Kalanchoe gastonisbonnieri</u>	<i>Crassulaceae</i>	01	01	01	01	04

29	Datura	Datura stramonium	<u>Solanaceae</u>	04	03	00	02	09
30	plumeria plant	Plumeria	<u>Apocynaceae</u>	02	02	00	03	07
31	marigold	Tagetes	Asteraceae	08	12	16	10	46

Trees in campus

Sr.	Common name of plant	Scientific name of plants	Name of family	Zones				Total no. of plants
				A	B	C	D	
1.	Subabool	<i>Leucaena leucocephala</i>	<u>Fabaceae</u>	11	13	14	05	44
2.	Kanak champa	<i>Pterospermum acerifolium</i>	Sterculiaceae	04	03	03	02	12
3.	Saptparni	<i>Alstonia scholaris</i>	Apocynaceae	03	00	02	03	08
4.	Indian laurel	<i>Ficus microcarpa</i>	<u>Moraceae</u>	05	07	03	03	18
5.	Cycas	<i>Cycas revoluta</i>	Cycadaceae	03	02	03	01	09
6.	Bael	<i>Aegle marmelos</i>	<u>Rutaceae</u>	01	01	02	01	05
7.	Gulmohar	<i>Delonix regia</i>	<u>Fabaceae</u>	02	02	01	01	06
8.	Amla	<i>Phyllanthus emblica</i>	<u>Phyllanthaceae</u>	03	02	02	03	10
9.	Ficus religiosa	<i>Sacred fig</i>	<u>Moraceae</u>	01	01	00	02	04
10.	Pimpal	<i>Ficus religiosa</i>	Moraceae	02	02	00	00	04
11.	Babul	<i>Vachellia nilotica</i>	Fabaceae	00	02	03	00	05
12.	Neem	<i>Azadirachta indica</i>	Meliaceae	04	04	03	04	15
13.	Indian coral tree	<i>Erythrina variegata</i>	<u>Fabaceae</u>	00	02	01	00	03
14.	Cinnamon	<i>Cinnamomum verum</i>	<u>Lauraceae</u>	02	00	01	01	04
15.	Jamoon	<i>Syzygium cumini</i>	<u>Myrtaceae</u>	02	01	00	02	05
16.	Ashoka	<i>Saraca asoca</i>	<u>Fabaceae</u>	03	02	03	04	12
17.	Persian silk tree	<i>Albizia julibrissin</i>	Fabaceae	04	02	03	02	11
18.	Golden shower tree	Cassia fistula	Fabaceae	02	01	02	00	04
19.	Giant cedar	Thuja plicata	<u>Cupressaceae</u>	02	01	01	00	04

Grass

Sr.	Common name of plant	Scientific name of plants	Name of family
1	Giant cane	<i>Arundinaria gigantea</i>	<u>Poaceae</u>
2	Indian love grass	<i>Eragrostis pilosa</i>	<u>Poaceae</u>
3	stink love grass	<i>Eragrostis cilianensis</i>	<u>Poaceae</u>
4	Little love grass	<i>Eragrostis minor</i>	<u>Poaceae</u>
5	Tumble windmill grass	<i>Chloris verticillata.</i>	<u>Poaceae</u>
6	harali	<i>Cynodon dactylon</i>	<u>Poaceae</u>
7	Buffalo grass	<i>Bouteloua dactyloides</i>	<u>Poaceae</u>
8	Annual bluegrass	<i>Poa annua</i>	<u>Poaceae</u>
9	Japanese lawnglass	<i>Zoysia japonica</i>	<u>Poaceae</u>
10	Fescues grass	<i>Festuca</i>	<u>Poaceae</u>

Insects

Sr. No.	Common name	Scientific name	status
1	Butterfly	<i>Rhopalocera</i>	Common
2	House Cricket	<i>Acheta domestica</i>	Common
3	American Cockroach	<i>Blatta orientalis</i>	Common
4	Mound Termites	<i>Bellicositermes natalensis</i>	Rare
5	Tiger Beetles	<i>Cicindela octonotata Wiedemann</i>	Common
6	Spanish Fly	<i>Lytta versicatoria</i>	Rare
7	Common Earwig	<i>Forficula auricularia Linnaeus</i>	Rare
8	Honey Bees	<i>Apis mellifera</i>	Common
9	Bagworm moth	<i>Psychidae Species</i>	Common
10	Common Wasp	<i>Vespula vulgaris</i>	Common
11	Short Horned Grasshopper	<i>Acridid sp</i>	Common
12	Long Horned Grasshopper	<i>Tettigonid sp</i>	Common
13	Millipedes	<i>Polyxenus lagurus</i>	Common
14	Centipedes	<i>Scutigera coleoptrata</i>	Common
15	Black Scorpions	<i>Chactopsis insignis</i>	Common
16	Aphid	<i>Aphidoidea</i>	Common
17	Ladybird beetle	<i>Coccinellidae</i>	Rare
18	Dragonfly	<i>Anisoptera</i>	Common
19	Japanese beetle	<i>Popillia japonica</i>	Common
20	Carpenter ant	<i>Camponotus pennsylvanicus</i>	Common
21	Flea beetle	<i>Alticini</i>	Common
22	House flies	<i>Musca domestica</i>	Common
23	Red harvester ants	<i>Solenopsis invicta</i>	Common
24	Black ants	<i>Lasius niger</i>	Common
25	Braconid wasp	<i>Braconidae</i>	Common

Birds

Sr. no	Common name	Scientific name	Status
1	House sparrow	<i>Passer domesticus</i>	common
2	Woodpecker	<i>Picidae</i>	common
3	Parrot	<i>Psittaciformes</i>	common
4	Crow	<i>Corvus brachyrhynchos</i>	common
5	Common blackbird	<i>Turdus merula</i>	common
6	Myna	<i>Acridotheres tristis</i>	Rare
7	Cow Bird	<i>Molothrus ater</i>	common
8	Kingfisher	<i>Alcedinidae</i>	Rare
9	Wood Pigeon	<i>Columba palumbus</i>	common
10	Spotted Dove	<i>Spilopelia chinensis</i>	Rare
11	Nightingale.	<i>Luscinia megarhynchos</i>	Rare

Reptiles

Sr. no	Common name	Scientific name	Status
1	Sand lizard	<i>Lacerta agilis</i>	Common
2	Common garden skink	<i>Lampropholis guichenoti</i>	Common
3	Oriental garden lizard	<i>Calotes versicolor</i>	Common
4	Indian Chameleon	<i>Chamaeleo zeylanicus</i>	Common
5	Ornate tree lizard	<i>Urosaurus ornatus</i>	Common

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