



Floristic Diversity and Vegetation Analysis of Heritage Langat Singh College, North Bihar, India

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Abstract: Heritage campuses (including older universities/ college campuses) are home in urban areas for biodiversity study and conservation. Present study was undertaken to enumerate the natural plant diversity of one of the old heritage college of north Bihar; Langat Singh College, Muzaffarpur Bihar. On average of 91 plant species naturally including woody (trees), non-woody shrubs/herbs/grasses/ and ornamental plants has been identified. Species were analysed and its socio-economic aspects were also enumerated. Meliaceae and Fabaceae dominated the tree flora whereas *Poaceae* (grasses) dominated the non-woody flora. The tree species, viz. *Swietenia mahogani* and *Swietenia macrophylla* (Meliaceae) and *Cassia abbreviata* (Fabaceae) were most frequent and *Ficus benghalensis*, *F. religiosa*, *Phoenix dactylifera*, *Polyalthia longifolia* also thriving well. Out of total 91 species documented, 83 species representing 30 families are dicotyledonous while 13 species (6 families) are monocotyledonous. The most dominant dicot family is Fabaceae represented by maximum number of 10 species followed by Apocynaceae (7 species), Moraceae and Asteraceae represented by 6 species each. In monocot, majority of plants belongs to family *Poaceae*. The *Cycas revoluta* and *Dryopteris ludoviciana* are also recorded from campus.

Keywords: Baseline data, Biodiversity, Conservation, Flora, Langat Singh College, Species diversity

To sustain biodiversity richness in urban ecosystems and rich diversified flora in urban cities may exist in different parks, botanical gardens, unused lands, urban forest or campus of old education Institutes. Educational institute/ campuses harboured high biodiversity and are a very informative and practical laboratory to perform floristic studies (Liu et al 2021). However, in India systematic review on the biodiversity of university/ college campuses is still lacking and confines to only few reports i.e.; flora of IISc. Bangalore (Suresh and Bhat 2000); B.H.U., Varanasi (Dubey 2004); Bharathiar university (Rajendran et al 2014), South campus B.H.U. Varanasi (Srivastava et al 2020), insert Fergusson College campus, Pune (Nerlekar et al 2016), Deccan College, Pune (Naik 2020), S.B.N Gov. PG College, Barwani (Sawle et al. 2022), Social Sciences Campus Rajagiri College, Kerala (Krishnakumar and Ramesh 2022), S.R.T. campus HNB Garhwal University (Dobhal and Uniyal 2023). Present study aimed to examine the vascular plant diversity in one of most premier and heritage academic institution of the North Bihar, India i.e., Langat Singh College (L.S. College), Muzaffarpur, Bihar, India.

MATERIAL AND METHODS

Study site: Langat Singh College is the premier, highly established and one of oldest heritage college of North Bihar, founded in year 1899. Campus is having habitat for rich biodiversity of several indigenous, exotic plants as well as

home to few rare and disappearing plant species.

The main campus geographically located at 26°07'N and 85°24'E. City has humid subtropical climate. The wet season is oppressive and mostly cloudy, the dry season is mostly clear, and it is hot year-round. Temperature of the city varied from 10°C to 40°C, rarely below 10°C and above 45°C. The hot summer season lasts from March to July, with an average daily temperature ranges from a high of 40°C to a low of 29°C. Winter season lasts for 2 months and is pleasant cool with daily temperature varied from 06° to 20°C. The summer season have good chances of the rainfall, while the winters have very little. Relative humidity varied up to 90% (max.) to 18% (min.). On an average, there is an approximate 1271 mm/ 50.0 inch of precipitation that occurs over the year. The most probable natural vegetation of north Bihar including Muzaffarpur is tropical mix deciduous type. The deciduous vegetation characterized by woody trees, which remain leafless during summer and have open canopy. Ground flora is seasonal.

Methodology: The present flora is based on the field surveys conducted continuously during the year 2021-2022. Weekly field observations were made for the collection and identification of different species. The flowered twigs were collected for identifying the plant species. Digital photographs of plants were also taken. The Identification of plants was carried out with the help of available Flora of Bihar and other standard publications (Haines 1921-1925, Singh et

al 2001) as well as authenticated by expert. The floristic survey primarily concern with natural vegetation analysis of campus.

RESULTS AND DISCUSSION

The vegetation in campus majorly dominated by trees (51%), followed by grasses, climbers, creepers (22%), shrubs (14%) and herbs (13%) (Fig. 1). In woody plants, more dominant families are: *Swietenia macrophylla* and *S. mahogany* (Mahogani), *Ficus benghalensis*, *F. religiosa*, *Azadirachta indica*, *Mangifera indica*, *Phoenix dactylifera* (Date Palm), *Cassia abbreviate* (Sjambok pod), *C. fistula* (Golden Shower tree), *Cocos nucifera* (coconut tree). In case of thorny and shrubby plants; *Callistemon viminalis* (weeping bottle brush), *Albizia julibrissin* (pink silk tree), *Ixora coccinea* (Ixora), *Leucaena leucocephala* (Su babool) are prominent. The species of grass and creepers typical to humid subtropical climate observed were *Ureana lobata* (Congo jute), *Cynodon dactylon* (Doob grass), *C. rotundus*, *Parthenium hysterophorus* (congress grass) *Colocasia esculenta* (Elephant ear), *Ipomoea*, *Hydrocotyle*, *Phyllanthus amarus* (Gale Of Wind) present in the swampy region of the campus.

Family based analysis of plant vegetation in field survey conducted in campus area shown about 91 species representing 80 genera belonging to 38 families have been identified, excluding the lichens, bryophytes and mycoflora which was not possible during the present study (Fig. 2 and 3). Out of the identified plant species, 43, 18 and 29 species belongs to woody trees, non-woody shrubby and herbaceous species, grasses, creepers, climbers and semi-aquatic plants. In listed plants, 89 belong to the angiosperms which include 83 species of dicotyledons and 6 species of monocotyledons. In Dicots, Meliaceae, Fabaceae, Moraceae are the dominant families present in the campus. The monocotyledons represent 6 families dominated

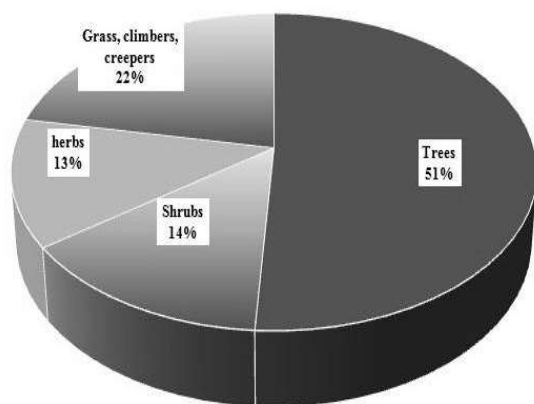


Fig. 1. Analysis of habit wise distribution of plant species in the campus area

Table 1. Plant species recorded in Langat Singh College campus, Muzaffarpur, Bihar

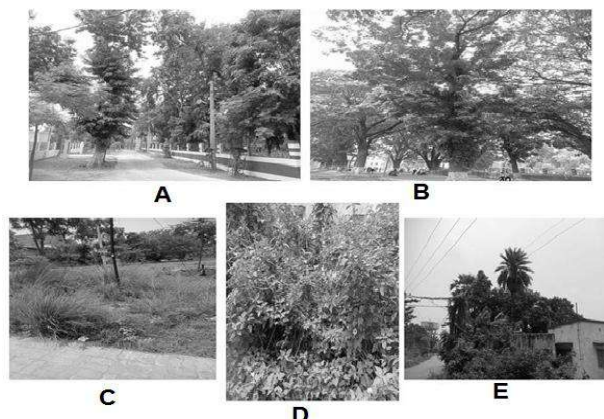
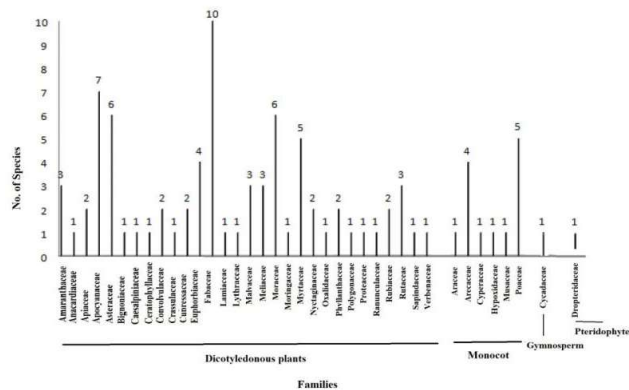
Botanical name	Common name	Family
<i>Achyranthes aspera</i>	Apamarga	Amaranthaceae
<i>Aegle marmelos</i>	Indian Bael	Rutaceae
<i>Albizia julibrissin</i>	Pink silk tree	Fabaceae
<i>Allamanda blancheti</i>	Purple Allamanda	Apocynaceae
<i>Alstonia scholaris</i>	Saptaparni	Apocynaceae
<i>Alternanthera spp.</i>	Joyweed	Amaranthaceae
<i>Amaranthus spinosus</i>	Spiny amaranth	Amaranthaceae
<i>Artocarpus heterophyllus</i>	Jackfruit	Moraceae
<i>Azadirachta indica</i>	Neem Tree	Meliaceae
<i>Ageratum conyzoides</i>	billy goat weed	Asteraceae
<i>Bauhinia variegata</i>	kachnar	Fabaceae
<i>Boerhavia diffusa</i>	Punarnava	Nyctaginaceae
<i>Borassus flabellifer</i>	Toddy Palm tree	Arecaceae
<i>Bougainvillea glabra</i>	Bougainvillea (Pink)	Nyctaginaceae
<i>Bryophyllum pinnatum</i>	Pathharchatta	Crassulaceae
<i>Callistemon viminalis</i>	Weeping Bottle brush	Myrtaceae
<i>Calotropis gigantea</i>	Aak, Mudar	Apocynaceae
<i>Calotropis procera</i>	Safed Aak, Mudar	Apocynaceae
<i>Cascabela thevetia</i>	Kaner (Yellow flower)	Apocyanaceae
<i>Cassia abbreviata</i>	Sjambok pod	Fabaceae
<i>Cassia fistula</i>	Amaltas (Golden Shower tree)	Caesalpiniaceae
<i>Catalpa bignonioides</i>	Indian bean tree	Bignoniaceae
<i>Catharanthus roseus</i>	pink periwinkle	Apocynaceae
<i>Ceratophyllum demersum</i>	Hornwort	Ceratophyllaceae
<i>Centella asiatica</i>	Gotu Kola	Apiaceae
<i>Chrysopogon lancearius</i>	Grass family	Poaceae
<i>Citrus maxima</i>	Batawi-nimbu	Rutaceae
<i>Cocos nucifera</i>	Coconut tree	Arecaceae
<i>Codiaeum variegatum</i>	Croton	Euphorbiaceae
<i>Colocasia esculenta</i>	Elephant's ear	Araceae
<i>Codiaeum variegatum</i>	Variiegated croton	Euphorbiaceae
<i>Curculigo orchoides</i>	Kali musli	Hypoxidaceae
<i>Cycas revoluta</i>	Cycas	Cycadaceae
<i>Cymbopogon gidarba</i>	Lemongrass	Poaceae
<i>Cynodon dactylon</i>	Doob or Durva	Poaceae
<i>Cyanthillium cinereum</i>	Sahadevi	Asteraceae
<i>Cyprus rotundus</i>	Java grass	Cyperaceae
<i>Dalbergia sissoo</i>	Sheesham tree	Fabaceae
<i>Delonix regia</i>	Flame tree	Fabaceae
<i>Dryopteris ludoviciana</i>	Southern woodfern	Dropteridaceae
<i>Eclipta alba</i>	False daisy	Asteraceae
<i>Eclipta prostrata</i>	False daisy or Bhringaraj	Asteraceae
<i>Eucalyptus globulus</i>	Eucalyptus	Myrtaceae
<i>Euphorbia hirta</i>	Asthma plant	Euphorbiaceae
<i>Euphorbia prostrata</i>	Ground Spurge	Euphorbiaceae
<i>Ficus bengalensis</i>	Banyan tree	Moraceae

Cont...

Table 1. Plant species recorded in Langat Singh College campus, Muzaffarpur, Bihar

Botanical name	Common name	Family
<i>Ficus racemosa</i>	Goolar	Moraceae.
<i>Ficus religiosa</i>	Peepal tree	Moraceae
<i>Grevillea robusta</i>	Silk oak	Proteaceae
<i>Haldina cordifolia</i>	Kadamb	Rubiaceae
<i>Hibiscus rosa-sinensis</i>	Gurhal, China rose	Malvaceae
<i>Hydrocotyle spp.</i>	Indian pennywort	Apiaceae
<i>Ipomoea aquatica</i>	Water Morning Glory	Convolvulaceae
<i>Ipomoea cairica</i>	Railroad creeper	Convolvulaceae
<i>Ixora coccinea</i>	Ixora	Rubiaceae
<i>Lantana camara</i>	Lantana	Verbenaceae
<i>Leucaena leucocephala</i>	Su babool	Myrtaceae
<i>Litchi chinensis</i>	Lychee	Sapindaceae
<i>Mangifera indica</i>	Mango tree	Anacardiaceae
<i>Mikania micrantha</i>	Climbing hempweed	Asteraceae
<i>Malvestrum tricuspidatum</i>	False Mallow	Malvaceae
<i>Miscanthus sinensis</i>	Zebra grass	Poaceae
<i>Moringa oleifera</i>	Drumstick tree	Moringaceae
<i>Morus nigra</i>	Black mulberry	Moraceae
<i>Morus rubra</i>	Red mulberry	Moraceae
<i>Murraya paniculata</i>	Orange jessamine	Rutaceae
<i>Musa paradisiaca</i>	Banana	Musaceae
<i>Nerium odorum</i>	White/ pink kaner	Apocynaceae
<i>Oxalis corniculata</i>	Yellow Wood Sorrel	Oxalidaceae
<i>Parthenium hysterophorus</i>	congress grass	Asteraceae
<i>Persicaria maculosa</i>	lady's thumb	Polygonaceae
<i>Pongamia pinnata</i>	Indian beech	Fabaceae
<i>Phoenix dactylifera</i>	Date Palm (Khajur)	Arecaceae
<i>Phyllanthus amarus</i>	Gale Of Wind	Phyllanthaceae
<i>Phyllanthus emblica</i>	Amla	Phyllanthaceae
<i>Pithecellobium dulce</i>	Jangal Jalebi	Fabaceae
<i>Platycladus orientalis</i>	Chinese thuja (morpankhi plant)	Cupressaceae
<i>Polyalthia longifolia</i>	False Ashoka tree (glossy leaves)	Fabaceae
<i>Prosopis spicata</i>	Shami	Fabaceae
<i>Punica granatum</i>	Pomegranet	Lythraceae
<i>Psidium guajava</i>	Guava	Myrtaceae
<i>Ranunculus scleratus</i>	celery-leaved buttercup	Ranunculaceae
<i>Roystonea regia</i>	Royal Palm	Arecaceae
<i>Saraca asoca</i>	Ashoka plant	Fabaceae
<i>Swietenia macrophylla</i>	Mahogany	Meliaceae
<i>Swietenia mahogani</i>	American mahogany	Meliaceae
<i>Syzygium cumini</i>	Jamun	Myrtaceae
<i>Tectona grandis</i>	Teak	Lamiaceae
<i>Thuja occidentalis</i>	Thuja	Cupressaceae
<i>Ureana lobata</i>	Congo jute	Malvaceae
<i>Vetiveria zizanioides</i>	Khus	Poaceae

including Poaceae, Araceae, Arecaceae, Cyperaceae, Musaceae and Hypoxidaceae. In addition one species of Gymnosperm (Cycadaceae) i.e., *Cycas revoluta* and one is Pteridophytic (Dryopteridaceae) i.e. *Dryopteris ludoviciana* were also observed (Table 1, Fig. 4). The distribution and

**Fig. 2.** A & B. Panoramic view of the main campus of L.S. College. C: road side view, D & E Floras behind Art department and nearby Botany department**Fig. 3.** Floristic diversity of L.S. College campus**Fig. 4.** Comparative analysis of species composition of different families in the campus

occurrence frequency of different plants shows variation along with temporal and seasonal variations (Satapathy and Das 2021, Ashrafuzzaman et al 2023).

CONCLUSION

The study reveals that Langat Singh college campus holds a highly diversified flora and rich in the plants of economic importance. Among the different plant species higher diversity found in dicotyledonous woody species while the lowest diversity found in shrubby species. This study also reveals that the abstract plant community of this college campus is – *Swietenia* and *Cassia abbreviata*. The most dominant dicot family in campus is Fabaceae whereas in monocot Poaceae distributed in dominance. Plants resources of campus are also scrutinized for its future sustainable utilization. The majority of the plants recorded from the campus area are timber plants and many are having medicinal value. Introduction of some nonnative species also recorded. The present study would be helpful to derive conservation policies and make sustainable use of plant resources of campus flora.

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