Survey and documentation of Trees in Gandhi Park, Shivamogga Karnataka

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ABSTRACT
The structure and function of forest ecosystem is determined by the plant component more than any other living component of the system. Topography, soil, climate and geographical location of a region influence the vegetation diversity of the forest ecosystem. It was found that, plant diversity inventories in tropical forests have mostly been concentrated on tree species than other life-forms. The nature of forest communities largely depends on the ecological characteristics in sites, species diversity and regeneration status of species. Species diversity is one of the most important indices used for evaluating the stability and sustainability of forest communities. Rapid urbanization is destroying natural ecosystems and degrading the environmental quality of towns and cities. Urban trees in parks, yards, streets, and remnant parcels have been features of urban design and landscape architecture for centuries. Conservation and restoration of urban green spaces comprising of urban trees and forests are one important aspect of improving the environmental quality of urban areas. The term 'urban trees' generally includes trees growing bothwithin the built environment as well as road-side avenues and public places in urban systems. We have initiated a study of the trees in Gandhi park, Shivamogga, Karnataka and the preliminary data on the species of trees in Gandhi park Shivamogga.

Keywords: Documentation, Trees, Gandhi park, Shivamogga

Introduction

The structure and function of forest ecosystem is determined by the plant component more than any other living component of the system (Richards 1996). The plant diversity at any site is influenced by species distribution and abundance patterns (Palit&Chanda 2012) and the richness of plant species is controlled by a variety of biotic and abiotic parameters (Rannie 1986 and Huston 1994). Topography, soil, climate and geographical location of a region influence the vegetation diversity of the forest ecosystem (Ram et al. 2004). It was found that, plant diversity inventories in tropical forests have mostly been concentrated on tree species than other life-forms (Mani &Parthasarathy 2006).
The nature of forest communities largely depends on the ecological characteristics in sites, species diversity and regeneration status of species (Khumbongmayum et al.2006). Species diversity is one of the most important indices used for evaluating the stability and sustainability of forest communities. Information on the species composition of a forest is essential for its wise management interms of economic value, regeneration potential (Wyatt-Smith 1987) and ultimately may be leading to conservation of biological diversity (Verma et al. 1999).
sRapid urbanization is destroying natural ecosystems and degrading the environmental quality of towns and cities (Folke et al., 1997, Gregg et al., 2003, Alberti, 2004 and Marzluff, 2004). Many cities have

been experiencing unprecedented growth, accompanied by severe environmental degradation (e.g. noise, carbon pollution, soil erosion, habitat loss, and species extirpation (Zipperer at al., 2011, Vesely, 2007, Young, 2010). Urban trees in parks, yards, streets, and remnant parcels have been features of urban design and landscape architecture for centuries (Arnold, 1980).

Conservation and restoration of urban green spaces comprising of urban trees and forests are one important aspect of improving the environmental quality of urban areas. The term 'urban trees' generally includes trees growing both within the built environment as well as road-side avenues and public places in urban systems. In spite of their eco-sociological importance, urban trees have not received much scientific attention in India. There are only a few detailedstudies on the urban trees of cities like Bangalore (Sudha and Ravindranath, 2000, Nagendra and Gopal, 2010), karwar (Shivanand at al., 2012) Chandigarh (Kohli at al., 1994) Shivamogga (Ramesh 2024) and Nagpur (Gupta et al, 2008).We have initiated a study of the trees in Gandhi park, Shivamogga, Karnataka and the preliminary data on the species of trees in Gandhi park Shivamogga.

Materials and methods

The study was carried out around the Gandhi park Shivamogga, Karnataka state in May -1 to July-30. Geographically Gandhi Park is located in the centre of the City; it covers a land area of 28.3 acres. The geographical coordinates are 13.9336^0 North and 75.5761^0 East. Gandhi Park is characterize by the presence of scattered Tress and dense grass cover. There are few points on the map showed the sampling point within the Gandhi Park. The survey involved the collection, identification and description of various trees commonly found in Gandhi Park. The study area was divided into five Sites for accurate recording of different ornamental plants Sites 'A' represents Horticulture department sites, 'B' towards mahaveera circle Sites, 'C' Basaveshwara circle, sites 'D' opposite to Corporation and sites 'E' centre of the park. The trees were collected and identified using standard Floras and manuals of the region and with the help of plant taxonomist. Data obtained were analyzed using both description and quantitative statistics such as tables.

Result and Discussion

In the present study, it was observed that different plant species have different aesthetic values and are used for different purposes including beautification and shades in the study area.

The field expedition of the study area showed interesting results concerning floristic diversity.

The preliminary data on the species diversity of urban trees of Gandhi park shivammogga comprises of 38 species. These species represent a total of 31 plant genera and 22 families. A list of all these trees with their family, and common name provided as table 1. A total of 100 trees belonging to all the species were enumerated during the present study. The tree species diversity of Gandhi ParkShivamogga is high when compared to the smaller area. A comprehensive study of Gandhi Park of 28.3 acres. The geographical coordinates are 13.933 North and 75.5761 east found 38 species in the different land-use categories.

In which fabaceae was the most dominant family with (10 genera and 10 species), Rubiaceae with (5 genera and 5species), Combretaceae with (4 genera and 4species), Moraceae with (3 genera and 3 species), Annonaceae, Rutaceae, Rhamnaceae, Euphorbiaceae with (2 genera and 2 species), Meliaceae, Rosaceae, Mangrove, Araceae, Myrtaceae, Mulberry, Leguminaceae, Apocynaceae, Caesalpinaceae, Casuarinaceae,Oleaceae, Santalaceae, Bignoniaceae,Malvaceae (each with one genera and one species).

Table 1: List of trees documented in study area.

Sl No	Name	Scientific name	Family	Flowering Season
1	Yerrega	Haldina cordifolia	Rubiaceae	July- Dem
2	Hunuse	Tamarindus indica	Caesalpinioideae	July-September
3	Ashoka mara	Polyalthia longifolia	Annonaceae	March-May
4	Neem tree	Azadirachta indica	Meliaceae	Januar-May
5	May flower	Delonix regia	Caesalpinioideae	April-May
6	Jack Fruit	Artocarpus heterophyllus	Moraceae	December until February or march
7	Crested nut	Caesalpinia crista	Caesalpinioideae	July-April
8	Rain tree	Samanea saman	Fabaceae	March to May and towards the end of the year
9	Aloha hawaiians	Psydrax odorata	Rubiaceae	Late spring to summer
10	Cabbage palm palmite	Roystonea oleracea	Arecaceae	Jun -July
11	Jamun tree	Syzgium cumini	Mytraceae	March-April
12	Jack furit tree	Artocarpurs Heterophylls	Anacardiaceae	December until Feb.
13	Horse wood	Clausena anisata	Rudaceae	It produces yellow flower in spring
14	Gulugunji mara	Adenanthera pavonia	Fabaceae	May –June May-Aug
15	Yethiga	Adina cordifolia	Rubiaceae	June – August
16	Bilva	Aegle marmelos	Rutaceae	April-May
17	Bage	Albizia lebbeck	Fabaceae	September-October
18	Halemara	Alsonia scholaris	Apocyanaceae	March-July
19	Kadamba	Neolamarckia cadamba	Rubiaceae	Monsoon season
20	Mandara	Bauhinia purpurea	Caesalpinaceae	September-November
21	Mani mandara	Bauginia tomemtosa	Fabaceae	All year round but primarily bloom between nov-jan
22	Muthaga	Butea monosperma	Fabaceacae	February – April
23	Galimara	Casuarina equisetifolia	Casuarinaceae	Feb-April

				Sept through Oct
24	Rubber mara	Ficus elastica	Moraceae	Spring and summer
25	Arali /Ashwath	Ficus religiosa	Moraceae	Flowers in Feb, fruit in may to June.
26	Parijata	Nyctan thus arbor-tristis occidentale	oleaceae	August to December
27	Rajavale	Phyllanthus cidus	Euphorbiaceae	March- April
28	Nellikayi	Phyllanthus emblica	Euphorbiaceae	March-April
29	Sihihunese	Pithecellobium dulce	Fabaceae	March –April
30	Falls ashoka	Polyalthia longifolia	Annonaceae	March, April, July September
31	Gandha	Santalum album	Santalaceae	Dec-April
32	Flame tree	Spathodia campanulata	Bignoniaceae	Usually in the spring season
33	Indian almond	Terminalia catappa	Combretaceae	Feb-may
34	Hunalu	Terminalia paniculata	Combretaceae	June – oct
35	Arjuna	Terminalia arjuna	Combretaceae	May-June
36	Shantimara	Terminalia bellirica	Combretaceae	In summer
37	Huvarasi	Thespesia populnea	Malvaceae	Throughout the year.
38	Borehannu	Ziziphus mauritiana	Rhamnaceae	July – November

Table 2: Family distribution of trees

SI / NO	FAMILY	NUMBER OF TREE	PERCENTAGE %
1	Rubiaceae	5	13.15%
2	Annonaceae	2	5.26%
3	Fabaceae	10	26.31%
4	Meliaceae	1	2.63%
5	Rosaceae	1	2.63%
6	Moraceae	3	7.89%
7	Mangrove	1	2.63%
8	Aracaceae	1	2.63%
9	Myrtaceae	1	2.63%
10	Rutaceae	2	5.26%
11	Rhamnaceae	2	5.26%
12	Leguminceae	1	2.63%
13	Apocynaceae	1	2.63%
14	Caesalpiniaceae	1	2.63%
15	Casuarinaceae	1	2.63%
16	Oleaceae	1	2.63%
17	Euphorbiaceae	2	5.26%

18	Santalaceae	1	2.63%
19	Bignoniaceae	1	2.63%
20	Combretaceae	4	10.52%
21	Malvaceae	1	2.63%

Conclusion

Tree Gandhi park trees serve many useful functions such as climate change mitigation by carbon sequestration, air quality improvement by air pollution abatement, biodiversity conservation and source of ecosystem goods to urban inhabitants. They also have aesthetic, socio-religious and recreational value. In spite of the importance, they have not received much scientific attention. In this work, aimed to documentation and identification of trees. The preliminary study of tree in Gandhi park Shivamogga comprises of about 38 species in which majority are indigenous species and few others involve exotic and introduced species. The tree diversity represents a good assemblage of different utility categories such as wild and cultivated fruit yielding trees, shade and ornamental trees, sacred and religious tree

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