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**BIODIVERSITY CONSERVATION THROUGH URBAN
GREEN SPACES: A CASE STUDY OF GULBARGA
(Kalaburagi) CITY IN KARNATAKA**

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ABSTRACT

The present study deals with the diversity of Gulbarga Gulbarga city and the surrounding region which forms an important green space in the urban environment o Gulbarga f city in Karnatak bstate, India. The extensive field surveys were carried out in the vast study area. A total of 29(09 Fruit Bearing Plants, 06 Flowering Planta & 14 Medicinal Plants) belonging to different genera and families were recorded in the study area. Among the flowering plants, the herbs were found to be dominant, indicating they favored the climatic factors like less rainfall and high temperature in the study area. The urban green spaces with such rich plant diversity need to be conserved, especially with the help of the local population, in order to maintain a good environment and biodiversity, thereby improving the overall quality of life.

KEYWORDS: *Gulbarga city; urban; green space. biodiversity;*

I: INTRODUCTION

Biodiversity refers to the different genera and species of organisms present in a particular area which varies from one ecosystem to the other. India is a very rich country in terms of the rich flora and fauna present in the natural ecosystems. However, as the human civilizations expanded and as the population increased, many natural ecosystems came under the axe of widespread urbanization. Over the past several decades the rapid and widespread urban sprawls have resulted in the loss of natural vegetation and fragmentation of open green spaces

which facilitate environmental and ecological functions. The components of natural and cultural realms determine the mixture of introduced and indigenous vegetation of urbanized areas. The floristic compositions of various green belts in the cities are closely associated to the human activities. Typical Forest map of Gulbarga district is shown in Figure .1

Fig 1. Forest cover map of GULBARGA District.



II: LOCATION & ACCESSIBILITY:

Gulbarga district, officially known as Kalaburagi district, is one of the 30 districts of Karnataka state in southern India. Gulbarga city is the administrative headquarters of the district. This district is situated in

northern Karnataka between 76°.04' and 77°.42 east longitude, and 17°.12' and 17°.46' north latitude, covering an area of 10,951 km². The Gulbarga City map is shown in Figure 2.

Fig 2. The Gulbarga City Map.



Green Space Of Gulbarga city



III: GEOGRAPHY

Gulbarga is situated in Deccan Plateau located at 17.33°N 76.83°E and the general elevation ranges from 300 to 750 meters above mean sea level. Two main rivers, Krishna and Bhima, flow in the district. Black soil is predominant soil type in the district. The district has a large number of tanks which, in addition to the rivers, irrigate the land. The Upper Krishna Project is major irrigation venture in the district. Bajra, toor, sugarcane, groundnut, sunflower, sesame, castor bean, black gram, jowar, wheat, cotton, ragi, Bengal gram, and linseed are grown in this district.

IV: MATERIALS AND METHODS

The survey of floral diversity was conducted in the Gulbarga city jurisdiction only. The climate of the area is extremely dry, with a hot summer in the months of May and a mild winter in the month of November. The southwest monsoon brings rainfall and a humid climate in the months of July – September. The study area being large, it was divided into smaller wards and extensive field survey was carried out to record the plant diversity.

The identification of the plants was done as much as possible in the field with the help of standard floras and specimen photographs were also taken. Notes were also taken on their habits, habitats, life forms and associated diversity.

V: RESULTS AND DISCUSSIONS

The results revealed the presence of 29 species of plants, belonging to different genera and families in the Gulbarga city and the surrounding areas. Medicinal Plants dominated the study area, followed by fruit yielding plants finally a less no of flowering plants.

At the generic level, species belonging to genus *Cassia* were found to be dominating the area, with 9 species, followed by *Euphorbia*, *Hibiscus*, *Heliotropium*, *Clerodendrum* and *Ficus*.

During a good monsoon season many wetlands including ponds and ditches appear in the city, which support luxuriant growth of algae with hydrophytes. During such moist and humid environments, one can also find fungi, like mushrooms. The plants recorded in the study were broadly divided into trees, shrubs, climbers and

herbs. The herbs dominated in the (41%), followed by trees, shrubs and climbers (Fig. 3). The higher percentage of herbs in the study area can be attributed to edaphic and climatic conditions, such as reduced rainfall and high temperatures. During summers the temperature becomes severe and the

soil becomes intolerable for the plants. As a result, only short-living plants, like annual herbs are favored, as they can complete their life cycle before the commencement of the dry season and set seed during summer.

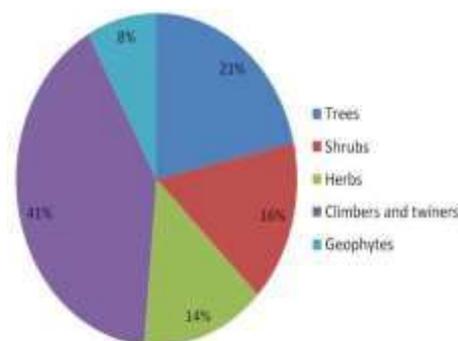


Fig. 3. Percentage composition of different plant habits in the study area.

Many plants, especially trees and shrubs (including natural and planted), were present in the city, which enhance the beauty of the area, with their beautiful flowers and they also provide nutritious fruits. The important fruit trees in the city include *Annona squamosa* (Custard Apple), *Limonia acidissima* (Wood apple), *Moringa oleifera* (Drumstick tree), *Tamarindus indicus* (Tamarind tree), *Mangifera indica* (Mango tree), *Psidium guajava* (Guava tree), *Carica papaya* (Papaya tree), *Punica granatum* (Pomegranate tree), *Achras zapota* (Sapota fruit tree) and *Emblica officinalis* (Amla tree). Some of the important plants which enhance the beauty of the campus with their colorful and scented flowers include *Hibiscus rosa-sinensis*, *Callistemon lanceolatus*, *Pongamia pinnata*, *Plumeria rubra*, *Delonix regia*, *Lawsonia innermis*, *Ixora parviflora*, *Bougainvillea spectabilis*, *Jasminum multiflorum*, *Nerium indicum*, *Cassia* sps., etc. Moreover, a significant number of plants having

ethnobotanical and medicinal values are also distributed in various parts of the study area. Some of the well known medicinal plants with high therapeutic importance, like *Azadirachta indica*, *Althea rosea*, *Emblica officinalis*, *Tribulus terrestris*, *Terminalia chebula*, *Calotropis procera*, *Gymnema sylvestre*, *Ocimum sanctum*, *Ficus religiosa*, *F. benghalensis*, *Aloe vera*, etc. are well represented in the study area. Table 1, lists the important fruiting, flowering and medicinal plants in the Gulbarga city. The city authorities have developed some open spaces as Medicinal plant gardens, where extensive plantation of medicinal and ethnobotanical plants is carried out, . Additionally, the plantation of trees on a large scale is also practiced on various occasions in order to sensitize the people about the importance of green spaces, especially in mega cities. Care is also being taken to monitor the growth of the plants in the city and protect them from any kind of disturbance by outsider

Table1. The important Plants of Gulbarga city.

Sl.No	Botanical Name	Family	Common Name	Habit
Important fruit bearing plants				
1.	<i>Annona squamosa</i> L.	Annonaceae	Custard apple	Tree
2.	<i>Limonia acidissima</i> L.	Rutaceae	Wood apple	Tree
3.	<i>Mangifera indica</i> L.	Anacardiaceae	Mango	Tree
4.	<i>Moringa oleifera</i> Lam.	Moringaceae	Drumstick	Tree
5.	<i>Tamarindus indica</i> L.	Caesalpinaceae	Tamarind	Tree
6.	<i>Terminalia catappa</i> L.	Combretaceae	Badam	Tree
7.	<i>Eugenia jambolana</i> Lam.	Myrtaceae	Jamun	Tree
8.	<i>Carica papaya</i> L.	Caricaceae	Papaya	Tree
9.	<i>Achras zapota</i> L.	Sapotaceae	Chikoo	Tree
Important flowering plants				
10.	<i>Cassia fistula</i> L.	Caesalpinaceae	Garmalo	Tree
11.	<i>Cassia nodosa</i> L.	Caesalpinaceae	Pink cassia	Tree
12.	<i>Delonix regia</i> Raf.	Caesalpinaceae	Gulmohar	Tree
13.	<i>Albizia lebbek</i> (L.) Bth.	Caesalpinaceae	Pilo shirish	Tree
14.	<i>Callistemon lanceolatus</i> DC.	Myrtaceae	Bottle brush	Tree
15.	<i>Bougainvillea spectabilis</i> Willd.	Nyctaginaceae	Bouganvel	Climber
Important medicinal plants				
16.	<i>Azadirachta indica</i> A. Juss	Meliaceae	Neem	Tree
17.	<i>Butea monosperma</i> (Lam) Taub	Papilionaceae	Khakhro	Tree
18.	<i>Pongamia pinnata</i> (L.) Pierre	Papilionaceae	Karanj	Tree
19.	<i>Terminalia chebula</i> Retz.	Combretaceae	Herde	Tree
20.	<i>Vinca rosea</i> L.	Apocynaceae	Barmasi	Herb
21.	<i>Rauwolfia serpentina</i> L.	Apocynaceae	Sarpgandha	Shrub
22.	<i>Gymnema sylvestre</i> (Retz.) Schult	Asclepiadaceae	Madhnashi	Climber
23.	<i>Withania somnifera</i> (L.) Dunal	Solanaceae	Ashwagandha	Shrub
24.	<i>Vitex negundo</i> L.	Verbenaceae	Nagod	Small Tree
25.	<i>Ocimum sanctum</i> L.	Lamiaceae	Tulsi	Herb
26.	<i>Ocimum basilicum</i> L.	Lamiaceae	Damro	Herb
27.	<i>Emblica officinalis</i> Gaertner	Euphorbiaceae	Amla	Tree
28.	<i>Ficus religiosa</i> L.	Moraceae	Peepal	Tree
29.	<i>Aloe vera</i> L.	Liliaceae	Kunvar Pathu	Herb

VI: CONCLUSIONS

The presence of a rich plant diversity in the Gulbarga city and the surrounding regions make it one of the important green belts of Gulbarga city and it helps in keeping the area pollution free, to a great extent. Due to unplanned and uncontrolled urban

sprawl, the natural ecosystems get fragmented and have patchy distribution in the form of small and large green spaces in the urban landscape. Hence, it is necessary to link the various green spaces of urban areas, which are otherwise fragmented, to form green corridors. The public should also be involved in

various activities related to environment awareness and protection, as well as in the development of green spaces in and around city. Such activities, in association with sustainable urban planning will help increase biodiversity in the city and improve the quality of life for all residents.

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