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RESEARCH ARTICLE

STUDY ON AGROBIODIVERSITY RELATED WITH URBAN GREENING

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ABSTRACT

A biodiversity-based on sustainable agriculture is a potential solution for many of the problems associated with intensive, high input agriculture and for greater resilience to the environmental and socioeconomic risks that may occur in the uncertain future. To determine its contribution to ecosystem goods and services and value for society at large, and evaluate options for the sustainable use and conservation of biodiversity across the agricultural landscape. Agrobiodiversity is most likely to enhance agro ecosystem functioning when assemblages of species are added results in unique or complementary effects on ecosystem functioning by planting higher yield or pest resistance, mixing specific genotypes of crops, or including functional groups that increase nutrient inputs and cycling. Urbanization-related land-use changes and their spatial variation across the country and the impacts of urbanization and associated waste disposals, consequent shifts of soil utilization on areal soil quality. Accelerated urbanization along with explosive economic growth has further worsened the shortage of agricultural land over the last two decades. Increasing concern over land is expressed in terms of soil availability for grain production and soil quality degradation. Although conversion to urban and industrial uses took up a comparatively small share of total cultivated land loss, urbanization should still be considered as a great threat to future agricultural production for several reasons. Urbanization is increasing the risk of soil pollution through waste disposal and acid deposition derived from urban air pollution. This present study paper considers the value of agrobiodiversity for agricultural production within the context of understanding how biodiversity can be conserved in landscape and urban greening which contain mixtures of land use types and potential impacts on the agricultural biodiversity are analyzed.

INTRODUCTION

Trees and green spaces help keep cities cool, act as natural filters and noise absorbers; improve microclimates and the quality of natural resources including soil water, vegetation and wildlife. The tangible benefits of urban forests include availability of fruit, fuel wood and small timber. The most explosive urban growth is expected in India. The need of the hour in India is to educate people and policy makers about the utility of urban spaces because public knowledge of the connection between human well being and ecosystem services is limited (Sheikh, M.A and Kumar (2010). In urban environments human alter these soil-forming factors by impacts associated with urban infrastructure. For instance, building specifications often result in the scraping, compacting and covering of urban soil, which can impact soil organic matter, texture, structure, bulk density, infiltration, aeration, root penetration and biological activity.

Urban agriculture produces and markets foods and fuel largely in response to the daily demand of consumers within a town, city or metropolis on land and water dispensed throughout the urban and peri-urban area. Permaculture is a sustainable form of agriculture highly appropriate to urban areas, and comprises a system of farming and gardening that combines plants, animals, buildings, water, the landscape and people in a way that produces more energy than it uses (Australian Greenhouse office 2006). Urban trees are more permanent and tend to adapt to the site while gradually acquiring soil nitrogen over many years. Despite these obvious contrasts, tree fertilization regimes have followed an agricultural mindset, with fertilization performed to attain rapid growth. This was promulgated in the belief that tree vitality was equated with fast growth (Miller, 1998).

Selected Tree Samples

For the present study three different trees of different genera were selected in the college campus to find out the mineral profile of the selected tree canopy soil were analyzed, experimented and recorded. The data were then processed and represented in charts.

The following trees were selected for the present study:

Sample 1:*Butea monosperma, (Lamk.) Taub.*, (Family: Fabaceae)

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Sample 2: *Jacaranda mimosifolia, D. Don.,* (Family: Bignoniaceae)
Sample 3: *Cassia fistula, Linn.,* (Family: Caesalpiniaceae)

MATERIALS AND METHODS

Study Area

Coimbatore is a city in Tamil Nadu, South India. It is the second largest city and urban agglomeration in the Indian state of Tamil Nadu after Chennai. It is the capital city in Kongu nadu region and is often been referred to as the Manchester of south India. The city is located on the banks of the Noyyal River surrounded by the Western Ghats and is administered by the Coimbatore Municipal. Nirmala college academic campus is located in the southern parts of the Western Ghats. The total area of college campus is 20 acre. The temperature during both summer and winter varies between 28º c to 34º c. Soil in this area is red loamy soil which is more fertile than sandy soil. Its porosity allows high moisture retention and air circulation

Plate -1 Study Area

Plate- 2 Location Map

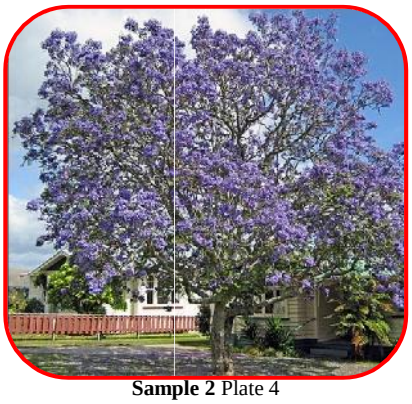
Collection of tree canopy soil samples

For the present study three different trees of different genera were selected in the college campus to find out the tree canopy soil. The tree canopy soil samples were collected during the year, 2013. Soil with litter formation and ground vegetation from the corners and centre of the selected samples of *Butea monosperma, (Lamk.) Taub., Jacaranda mimosifolia, D. Don., Cassia fistula, Linn.,* were collected separately in sterile bags. Barren land soil is taken from the same campus was kept as control. Soil was taken from the depth of 0-50cm. Soil samples were packed in sterile bags, and as soon as possible returned to the laboratory and processed within 2 days.

Mineral profile of the soil formed by the selected tree canopy

Mineral profiles of the soil formed by the selected trees of the leaves, wood logs, flowers, fruits were analyzed. The fallen fresh and dry leaves, flowers, fruits and seeds were powdered and kept in airtight container and the mineral profiles were analyzed

Sample 1-Plate 3
Butea monosperma, (Lamk.) Taub.,



Sample 2 Plate 4
Jacaranda mimosifolia, D. Don.,

Sample: 3 Plate 5
Cassia fistula, Linn .,

RESULTS AND DISCUSSION

The rate of soil organic matter decomposition increases when the soil is exposed to cycles of drying and wetting compared to soils that are continuously wet or dry (James, 2010). Water content in leaves, stems, tap roots and lateral root tissues significantly decreased with increasing concentration of salt in soil. There was maximum water content in lateral roots and minimum in leaves. Tissues, according to their water content

can be arranged in the following decreasing order: lateral roots > tap roots > stems > leaves **(**Taiz, 2006).

The tree canopy soil of the selected samples of *Butea monosperma, (Lamk.) Taub., Jacaranda mimosifolia, D. Don., Cassia fistula, Linn.,* were collected separately and mineral profiles were analyzed. The percentage of mineral Nitrogen is rich in all the three samples when compared to the other samples and little high amount of iron content is present in these three samples. And other percentage of mineral content like Potassium, Phosphate, Calcium, Magnecium, Chloride, Sodium and Sulphate is very low in all the three samples and this result were recorded in table and chart.

Table Mineral profile of the soil collected from the selected tree canopy

S.No.	Minerals	Control	*Butea monosperma*	*Jacaranda mimosifolia*	*Cassia fistula*
1.	Nitrogen%	0.030	**2.76**	**2.80**	**2.74**
2.	Potassium%	0.0009	0.066	0.064	0.063
3.	Phosphate%	0.010	0.085	0.080	0.080
4.	Calcium%	0.0081	0.33	0.32	0.44
5.	Magnesium%	0.0081	0.11	0.09	0.033
6.	Chloride%	0.0006	0.240	0.142	0.140
7.	Iron%	0.0057	0.66	0.80	0.85
8.	Sodium%	0.00001	0.0063	0.0062	0.0064
9.	Sulphate%	0.0003	0.12	0.16	0.10

Table: mineral profile of the soil collected from the selected tree canopy

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PLATE: 1 Study area
PLATE: 2 Location map
PLATE: 3 Sample 1- *Butea monosperma (Lamk.) Taub.,*
PLATE: 4 Sample 2- *Jacaranda mimosifolia, D. Don.,*
PLATE: 5 Sample 3- *Cassia fistula, Linn.,*
PLATE: 6 Sample 4- *Albizzia lebbeck, (L,) Benth.,*
PLATE: 7 Sample 5- *Peltophorum pterocarpum, (DC.*) *k. Heyne.,*

CHART- Mineral profile of the soil collected from the selected tree canopy

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