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Phyto-Diversity on Campus of K.M. Government College Narwana, India

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A B S T R A C T

A field appraisal on plant diversity of K.M. Government College campus Narwana was conducted during 15 January, 2016 to 31 January, 2016. Study was performed in all parts of the study area and plants were collected to prepare herbarium. Herbaceous flora was excavated as a whole whereas in case of shrubs and trees, only the tender twigs bearing flowers and fruits were taken. The dried specimens were pasted on the herbarium sheets. The herbarium sheets were protected against damage from insect and fungal pathogens by poisoning the sheets with 1% mercuric chloride and naphthalene balls. After field survey and herbarium preparation, all plants were identified by botanical name and family with the help of available literature. The total plants species recorded, indicated the heterogenous floristic composition in the college campus. Maximum species diversity was recorded of angiosperms among spermatophytes. Herbaceous genera were recorded more in number than the genera of shrubs and trees. The researchers can exploit this information in planning of sustainable utilization of these resources in and around Narwana town.

Introduction

India is one of the 12 "mega-diversity" countries in the world and this country has a forest area of 23.81% of the country's geographical area. Mankind has been utilizing plants for food and medicinal purpose since the time immemorial. Therefore various aspects of plants towards health, economic value, sustainable utility, their conservation, floral assessment and documentation are necessary. India is a rich center of plants diversity.

Distribution of plants depends on their genetic makeup, various environmental factors like temperature, water and other edaphic factors (Curtis and Cottom, 1956; Phillips, 1959; Misra, 1968). Plant diversity is the most important feature, which plays a vital role in complexity of natural ecosystems. The present paper is an attempt to know the distribution of plant diversity on campus of K.M. Government College Narwana, covering more than eight acres of

open area in addition to lawns, garden, teaching and administrative blocks. The present research has been carried out in K.M. Government College Campus Narwana (India) to explore the diversity of plants and for sustainable utilization of available plant resources. These findings will pave the way towards sustainable development in this era of indiscriminate collection of plants and their products. Besides this, results will give a bird's eye view on existing plant diversity in and around Narwana municipal area especially on spermatophytes.

Materials and Methods

The field study was carried out during 15 January, 2016 to 31 January,2016 in the campus of K.M. Government College Narwana (India). Study was performed in all parts of the study area and plants were collected to prepare herbarium. Herbaceous flora was excavated as a whole whereas in case of shrubs and trees, only the tender twigs bearing flowers and fruits were taken. The dried specimens were pasted on the herbarium sheets (Jain and Rao, 1977). The herbarium sheets were protected against damage from insect and fungal pathogens by poisoning the sheets with 1% mercuric chloride and naphthalene balls. After field survey and herbarium preparation, all plants were identified by botanical name and family with the help of available literature. The collected plants materials have been deposited in the herbarium of dept. of Botany, K.M. Govt. College Narwana. Methodology was covered in two phases as follows.

1. Field survey-The survey was conducted to collect information about the plant species like their identification and documentation in the form of Botanical name and family. The whole campus was visited many times for the collection of plants.

2. Literature collection-The identification was also done based on literature study (Hooker, 1875; Maheshawari 1963; Jain, 1968; Bhandari, 1978; Jain *et al.*, 2000; Kumar, 2001).

Results and Discussion

The Plant diversity is the functional and structural unit of the biotic components of ecosystem and is subjected to change due to the interaction of biotic and abiotic factors of the environment. On the basis of field survey of campus plants, 85 species showed their presence in the campus which were collected, identified and listed as shown in Table-1 and 2. Out of these plant species 34 species were of trees and 51 were of herbs and shrubs. Amongst the trees, most of the tree species were planted in collaboration with forest department, Haryana and species of herbs and shrubs were characterized by natural vegetation.

Poaceae was reported as the dominant family. Other main contributing families were Fabaceae (with its subfamilies like Caesalpinidae, Papillionadae, Mimosoidae), Solanaceae, Apocynaceae Euphorbiaceae and Asteraceae. The dominance of plants from Poaceae family in the study area indicates the harsh environmental conditions especially the water stress, because the species of Poaceae have made morphological, anatomical and physiological adaptations to overcome the drought conditions (Vasistha *et al*., 2010). Dominance of Fabaceae shows that these areas are nutrient deficient up to some extent especially nitrogen (Manhas *et al*., 2010; Vasistha *et al*., 2010). A large number of workers have provided useful botanical information through their publications. Works of Hooker (1875); Benthom and Hooker, (1876); Chopra *et al*., (1956); Maheshwari (1963); Bhandari (1978);

Meenakshi and Sharma (1985); Jain, 1979; Kumar (2001) have given description of various plant species in literal form. Therefore available literature was consulted for documentation of present research work.

Table.1 List of plants species with tree habit

Botanical Name	**Family**	**Habit**
Ficus benghalensis Linn.	Moraceae	Tree
Ficus religiosa Linn.	Moraceae	Tree
Ficus benjamina Linn.	Moraceae	Tree
Callistemon citrinus (Curtis) Stapf.	Myrtaceae	Tree
Tamarix aphylla Linn.	Tamaricaceae	Tree
Ficus carica Linn.	Moraceae	Tree
Polyalthia longifolia Sonn.	Annonaceae	Tree
Mangifera indica Linn.	Anacardiaceae	Tree
Kigelia pinnata (Jack.) DC.	Bignoniaceae	Tree
Alstonia scholaris (Linn.) R. Br.	Apocynaceae	Tree
Cassia fistula Linn.	Fabaceae	Tree
Emblica officinalis Gaertn.	Euphorbiaceae	Tree
Bombax ceiba Linn.	Bombacaceae	Tree
Thuja orientalis Linn.	Cupressaceae	Tree
Terminalia arjuna (Roxb.) Wight & Arn.	Combretaceae	Tree
Eucalyptus citriodora Hook.	Myrtaceae	Tree
Azadirachta indica A. Juss.	Meliaceae	Tree
Melia azedarach Linn.	Meliaceae	Tree
Dalbergia sissoo (Roxb.) DC.	Fabaceae	Tree
Oreodoxa regia Kunth Syn. *Roystonea regia* (Kunth) O.F. Cook	Arecaceae	Tree
Eugenia jambolana Lam. Syn. *Eugenia cumini* (Linn.) Druce	Myrtaceae	Tree
Accacia nilotica (Linn.) Willd.	Fabaceae	Tree
Prosopis juliflora (Sw.) DC.	Fabaceae	Tree
Prosopis cineraria (Linn.) Druce	Fabaceae	Tree
Aegle marmelos (Linn.) Correa Serr. ex Roxb.	Rutaceae	Tree
Bauhinia variegate Linn.	Fabaceae	Tree
Zizyphus jujuba Mill.	Rhamnaceae	Tree
Albizzia lebbeck (Linn.) Willd.	Fabaceae	Tree
Nyctanthes arbor-tristis Linn.	Oleaceae	Tree
Ailanthus excels Roxb.	Simaroubaceae	Tree
Morus alba Linn.	Moraceae	Tree
Phoenix sylvestris Linn.	Arecaceae	Tree
Psidium guajava Linn.	Myrtaceae	Tree
Butea monosperma (Lamk.) Taub.	Fabaceae	Tree

Table.2 List of plants species with herb and shrub habit-

Botanical Name	**Family**	**Habit**
Adhatoda vasica Linn.	Acanthaceae	Shrub
Ageratum conyzoides Linn.	Asteraceae	Herb
Aloe barbadensis Linn.	Liliaceae	Herb
Asparagus racemosus Willd.	Liliaceae	Herb
Barleria prionitis Linn.	Acanthaceae	Herb
Calotropis procera (Ait.) R.Br.	Asclepiadaceae	Shrub
Canna indica Linn.	Zinziberaceae	Herb
Vinca rosea Linn.	Apocynaceae	Herb
Coleus forskohlii Auct.	Lamiaceae	Herb
Cynodon dactylon (Linn.) Pers.	Poaceae	Herb
Cyperus rotundus Linn.	Cyperaceae	Herb
Datura innoxia Linn.	Solanaceae	Herb
Eclipta alba (Linn.)Hassk	Asteraceae	Herb
Cassia tora Linn.	Fabaceae	Herb
Euphorbia hirta Linn.	Euphorbiaceae	Herb
Tagetes erecta Linn.	Asteraceae	Herb
Hibiscus rosa -sinensis Linn.	Malvaceae	Shrub
Nerium indicum Mill.	Apocynaceae	Shrub
Phyllanthus niruri (Sensu) Hook. f.	Euphorbiaceae	Herb
Rosa indica Linn.	Rosaceae	Shrub
Sida acuta Linn.	Malvaceae	Herb
Achyranths aspera Linn.	Amaranthaceae	Herb
Argemone mexicana Linn.	Papaveraceae	Herb
Solanum Xanthocarpum Linn. Syn. *Solanum surrattense Burm.F.*	Solanaceae	Herb
Solanum nigrum Linn.	Solanaceae	Herb
Withania somnifera (Linn.) Dunal	Solanaceae	Herb
Tribulus terrestris Linn.	Zygophyllaceae	Herb
Parthenium hysterophorus Linn.	Asteraceae	Herb
Chenopodium album Linn.	Chenopodiaceae	Herb
Oxalis corniculata Linn.	Oxalidaceae	Herb
Vicia sativa Linn.	Fabaceae	Herb
Cannabis sativa Linn.	Cannabinaceae	Herb
Boerhaavia diffusa (Linn.) Nom. Cons.	Nyctaginaceae	Herb
Tridax procumbens Linn.	Asteraceae	Herb
Croton bonplandianum Baill.	Euphorbiaceae	Herb
Amaranthus caudatus Linn.	Amaranthaceae	Herb
Launaea asplenifolia (Willd.) Hook. F.	Asteraceae	Herb
Fumaria indica (Haussk.) Pugsley	Fumariaceae	Herb
Malvastrum coromandelianum (Linn.) Garcke.	Malvaceae	Herb
Lathyrus odoratus Linn.	Fabaceae	Herb

Ranunculus sceleratus Linn.	Ranunculaceae	Herb
Abutilon indicum Linn.	Acanthaceae	Herb
Aristida setacea Retz	Poaceae	Herb
Cymbopogon citratus (DC. ex Nees) Stapf	Poaceae	Herb
Dicanthium annulatum (Forsk.) Stapf	Poaceae	Herb
Heteropogon contortus (Linn.) Beauv. ex Roem. & Schult.)	Poaceae	Herb
Setaria glauca (Linn.) Beauv.	Poaceae	Herb
Scirpus litoralis Schrad Syn. *Schoenoplectus litoralis* Schrad.	Cyperaceae	Herb
Coronopus didymus (Linn.) Smith	Brassicaceae	Herb
Sisymbrium irio Linn.	Brassicaceae	Herb
Xanthium strumarium Linn.	Asteraceae	Herb

In order to maintain the ecological balance and to further sustainable development, plant species of economic and ecological importance are present in the study area. So these plant species superficially depict the composition of flora of Narwana sub divisional area. However, composition of annual herbaceous flora may vary in different seasons. Therefore these species can be utilized keeping in view the idea of sustainable development and utilization.

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