Original Research Article

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

Surender Kumar\(^1\)*, Sunita Duggal\(^2\), J.S. Laura\(^3\), Narender Singh\(^4\) and Rajdeep Kudesia\(^5\)

\(^1\)Department of Botany, K.M. Govt. P.G. College Narwana, Jind, India
\(^2\)Department of Botany, Govt. P.G. College Jind (Haryana), India
\(^3\)Department of Environmental Science, M.D. University, Rohtak, India
\(^4\)Department of Botany, Kurukshetra University Kurukshetra, India
\(^5\)Department of Botany, Bundelkhand University Jhansi, Uttar Pradesh, India

*Corresponding author

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.

Keywords
Narwana, Herbarium, Field survey, Phyto-diversity.

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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); Bentham 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 sisiso* (Roxb.) DC.  | Fabaceae       | Tree    |
| *Oreodoxa regia* Kunth Syn.     | Arecales      | Tree    |
| *Roystonea regia* (Kunth) O.F. Cook | Arecales | Tree    |
| *Eugenia jambolana* Lam. Syn.   | Myrtaceae      | Tree    |
| *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 variegata* Linn.      | Fabaceae       | Tree    |
| *Zizyphus jujuba* Mill.         | Rhamnaceae     | Tree    |
| *Albizia 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    |
| 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.      | Solanaceae          | Herb      |
| Solanum surrattense Burm.F.          |                     |           |
| 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.              | Anagraceae          | Herb      |
| Croton bonpladianum Baill.           | Euphorbiaceae       | Herb      |
| Amaranthus caudatus Linn.            | Amaranthaceae       | Herb      |
| Launaea asplenifolia (Willd.) Hook. F.| Asteraceae          | Herb      |
| Fumaria indica (Haussk.) Pugsley     | Fumariaceae         | Herb      |
| Malvastrum coronelianum (Linn.) Garcke.| Malvaceae          | Herb      |
| Lathyrus odoratus Linn.              | Fabaceae            | 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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| **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 |
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