FLORA OF JHAJJAR DISTRICT, HARYANA

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Abstract: The present work comprises of 731 species belonging to 459 genera and 114 families of Angiosperms. Of these 611 species under 371 genera and 93 families belong to Dicotyledones and 120 species under 88 genera and 21 families belong to monocotyledones. The ratio of families belonging to monocots and dicots were 1:4.46; of genera 1:4.21 and of species 1:5.09. The ratio of genus to species is 1:1.64.

Key words: Family, Flora, Genus, Jhajjar district.

INTRODUCTION

Diverse climate and habitat of India provide favourable conditions for colonisation of a variety of plant species. The flora of India thus show great diversity. It is one of the 12 mega diversity centre of the world with over 17,000 species of flowering plants. There are a large number of endemic species in the Himilaya and Peninsular India.

District Jhajjar came into being as a result of bifurcations of Rohtak district on 15th July 1997. Inhabited about eight hundreds years ago, Jhajjar city has many pages of history engulfed in it. At the time of Gori's attack in 1191 AD the area was a deserted forest. There was a town named Malokan in the east of present Jhajjar city mostly inhabited by Jats. Jhajjar district was named to commemorate the brave JatChajju of Malokan village who fought bravely to defend the country against Gori's.

The district is bounded by Bhiwani in the west, Delhi in the east, Gurgoan and Rewari in the South and Rohtak and Sonepat districts in the north respectively. The district lies at 28° 37^{N} latitude and 76° 39 longitude. The district is divided into three tehsils - Jhajjar, Bahadurgarh and Beri and comprises of five blocks - Jhajjar, Bahadurgarh, Sahlawas, Matanhail and Beri. The district is well known for its historical places like, Jhan Aara Bagh, Gurukul Jhajjar Museum and Bhimeshwar Devi Temple.

John forbes Royle (1799-1858), an English armyman, was the pioneer plant explorer of Northern India and Himalayan Mountains. He succeeded Govan as the Curator of the new Botanical Gardens at Saharanpur in 1823. Stewart (1869) studied the plants of Punjab and published under the tittle Punjab Plants. Flora of Upper Gangetic Plain and of the Adjacent Siwalik Hills and Sub-Himalayan tracts by Duthie (1903-1929). Flora of British India by Hooker (1972-1879). Flora of Delhi by J.K. Maheshwari (1963, 1966) are some other important publications on the flora of North-West India. A Catalogue of the Plants of the Punjab and Sindh (Atchison, 1869); Forest flora of North-West and Central India (Brandis, 1874) ; Grasses of North. West India - Indigenous and Cultivated (Duthie, 1883); Field and Garden Crops of North-West Provinces and Oudh. (Duthie & Fuller, 1882-1893) ; Forest Flora for the Punjab with Hazara and Delhi (Parker, 1918) ; the Flora of India Desert (Jodhpur and Jaisalmer) (Blatter *et al*., 1918-21); Forest Flora of Jaipur State (George, 1937); Common Grasses of the United Provinces (Bor, 1947); A contribution to the Flora of Punjab Plains and associated hill regions (Sabnis, 1940-41); Grasses of Jaipur (Gandhi *et al*., 1961); Some new records for the Punjab Plain (Nair, 1963 a.b., 1964, 1966); Flora of Rajasthan, West of Aravalis (Puri *et. al.*, 1964), Flora Punjab Plains (Nair, 1978) ; Flora of Indian Desert (Bhandari, 1978); Flora of North-East Rajasthan (Sharma *et al.*,1979) and Flora of North-East Haryana (Jain *et. al.*, 1982).

Flora of Jhajjar in Haryana has not been studied and to fill up this gap a comprehensive study of the Flora of Jhajjar was undertaken.

MATERIALS AND METHODS

The present work is based on intensive study of plants in the Jhajjar district for four consecutive years. The collection of plants was followed by their further study in the laboratory and their identification were finally confirmed at the herbaria of Northern Circle of Botanical Survey of India and Forest Research Institute, Dehradun.

A. Collection

All efforts were made to make excursions periodically in different parts of the district at regular intervals. As an outcome of this, it was possible to collect most of the plants in vegetative, flowering and fruiting stages from different localities and habitats. Intensive exploration was done in the areas with little biotic interference. Particular attention was paid to the areas adjoining rivers, canals and swamps.

In the course of the day's excursion, field observations including habit and habitats, soil type, flower colour, time

of flowering and fruiting, relative abundance were noted in a field note book. Complete plants or good size twigs with flowering and fruiting stages were gathered. All the plants were tagged with a number.

B. Preservation

The plants were pressed in old newspapers and blotting sheets for dehydration in strong plyboard presses in the field and later transferred to heavy metal plant press for perfect pressing. Corrugated sheets were used in between the newspapers sheets which permitted circulation of air. The specimens were changed to fresh sheets after an interval of 24 hours to 2-3 days depending on the weather conditions until the specimens were completely dry. The number and frequency of change was altered according to dryness of climate and fleshiness of tissues, for succulents the interval of change was frequent and for grasses it was short. The succulent plants were boiled in water before pressing. Dissected parts and loose parts such as large fruits and seeds were placed in paper packets pasted to the mounting sheet. Before mounting, the dehydrated specimens were poisoned by dipping them in saturated solution of mercuric chloride in ethyl alcohol. Nepthalene balls and periodical fumigation with formaldehyde were used as insect repellant during storage of herbarium sheets in almirahs. The dried and poisoned specimens were mounted on white herbarium sheets of standard size (43×28 cm). Fevicol (synthetic resin adhesive) was used as pasting material for plants which sticks fast and also minimizes the chances of insects attack.

C. Identification

The identification of plants was done with the help of Flora of British India (Hooker, 1872-1897), Flora of Upper Gangetic Plain and of the Adjacent Siwalik and Sub-Himalayan Tracts (Duthie, 1903-1929), Supplement to the Duthies Flora of Upper Gangetic Plain (Raizada, 1976), Herbaceous Flora of Dehradun (Babu, 1977), Flora of Delhi (Maheshwari, 1963) and other floras and monographs. For grasses the following floras were used; Grasses of Upper Gangetic Plain (Raizada and Jain, 1957, 1964); Grasses of Burma, Ceylon, India and Pakistan (Bor, 1960) and A list of Grasses of North-Western India (Duthie 1883). For cultivated plants, Manual of Cultivated Plants (Bailey, 1949) and J.F. Duthi's (1883) Indigenous and Cultivated Plants of Roorkee were consulted.

D. General Plan Of Present Work

In the present work for the sake of convenience, Benthem and Hooker's system of classification (1862-1883) was followed. Splitting of families was done following, Hutchinson (1959) and Airy Shaw's (1973) Genera in each family and species in each genus were arranged in alphabetical order for the convenience of reference.

Artificial keys are provided for genera within a family and species within a genus. The most convenient key is dichotomous that is based on successive choices between two contrasting alternative characters. The efforts are made to make artificial key as simple as possible without ignoring prime characters.

An effort has been made to make the plant nomenclature uptodate as far as possible after consulting available literature. The valid name of a species is followed by a reference to "Flora of British India", "Flora of Upper Gangetic Plain" and other recent literature. Basionyms and synonyms for species are also provided.

A short description is provided for each species. The description is followed by habit, abundance, flowering period, Local names and local uses. In general, it has been noticed that only such plants which are useful to local people have Local names.

DESCRIPTION

Statistical Analysis of the Flora

During the floristic studies of Jhajjar district the total number of species recorded was 731 belonging to 459 genera and 114 families of Angiosperms. Of these 601 species under 371 genera and 94 families belong to dicotyledones and 120 species representing 88 genera and 94 families belong to dicotyledones and 120 species representing 88 genera and 21 families belong to Monocotyledones. The ratio of families belonging to monocotyledones and dicotyledones was 1:4.46, of genera 1:4.21 and of species 1:5.09. The ratio of genera to species was 1:1.64 as compared to 1:1.63 for Delhi State, 1:2.2 for Upper Gangetic Plain and 1:7 for British India and 1:6 for India alone (Chatterjee, 1939). The table-1 shows the statistical data for various categories of flora.

Table 1. Statistical analysis

	Dicots		Monocots		Total
	Number	%age	Number	%age	
Families	93	81.73	21	18.26	114
Genera	371	80.82	88	19.17	459
Species	611	83.53	120	16.41	731

The analysis of flora indicates that the ten dominant families comprise nearly half the total plants recorded from the district. These families with their number of species, and genera in order of dominance are given below in Table-2.

Table 2. Ten dominent plant families of Jhajjar district

S. No.	Name of Family	Number of genera	Number of species
1.	Fabaceae	45	75
2.	Poaceae	35	57
3.	Asteraceae	35	44
4.	Malvaceae	12	24
5.	Acanthacea	12	21
6.	Convolvulaceae	06	20
7.	Scrophulariaceae	12	19
8.	Solanaceae	08	19
9.	Verbenaceae	11	17
10.	Boraginaceae	11	17

The analysis shows that the monocotyledones were less dominent and poorly represted except for the families Poaceae and Cyperaceae. Out of 120 species of monocotyledones 72 species belong to two families poaceae (57 species) and cyperaceae (15 species) while the remaining 659 species belong to 113 families.

In order to find out the relation of the present floristic investigation with other neighbouring and important floras a comparative list of 10 dominent families based on the number of species in given below (Table-3).

Table 3. Ten dominent families of district Jhajjar, Delhi State, Upper Gangetic Plain and British India

Sl. No.	District Jhajjar	Delhi State (After Maheshwari, 1963)	Upper Gangetic Plain (After Duthie, 1903-1922)	British India (After Hooker, 1904)
1.	Fabaceae	Poaceae	Poaceae	Orchidaceae
2.	Poaceae	Fabaceae	Fabaceae	Fabaceae
3.	Asteraceae	Asteraceae	Cyperaceae	Poaceae
4.	Malvaceae	Cyperaceae	Asteraceae	Rubiaceae
5.	Acanthaceae	Acanthaceae	Scrophulariaceae	Euphorbiaceae
6.	Scrophulariaceae	Euphorbiaceae	Malvaceae	Acanthaceae
7.	Verbenaceae	Convolvulaceae	Acanthaceae	Asteraceae
8.	Boraginaceae	Malvaceae	Euphorbiaceae	Cyperaceae
9.	Euphorbiaceae	Amaranthaceae	Convolvulaceae	Lamiaceae
10.	Convolvulaceae	Scrophulariaceae	Lamiaceae	Urticaceae

The above comparison of 10 dominent families shows that the families Poaceae and Fabaceae occupy first two positions in the floras of district Jhajjar, Delhi State and Upper Gangetic plains whereas Asteraceae, Acanthaceae and Euphorbiaceae are amongst the ten dominent families in all the four floras. This shows some similarity in the pattern of the flora's of district Jhajjar, Delhi State, Upper Gangetic Plain and British India.

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