

## Ecological Study of Gardens of Bhopal City, Madhyapradesh, India

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### Abstract

A field survey of wild herbs of Gardens of Bhopal city was conducted during October 2008 to October 2009 to find out the presence of wild herbs in gardens of the Bhopal city. The study revealed that the gardens were infested with thirteen wild herbs belonging to seven families. The most dominant families are Asteraceae, Papilionaceae, Euphorbiaceae, Poaceae, Convolvulaceae and Cyperaceae. The most prominent wild herb was *vernonia cinerea* (Linn.) Less., *Cyanadon dactylon* (Linn.) Pers. and *Medicago polymorpha* Linn. Certain wild herbs were found location specific.

**Key words :** Wild herbs, Gardens, Frequency, Density.

Bhopal is the capital of Madhya Pradesh, situated on 23°-16' North latitude and 77°-25' East longitude. Climate of Bhopal is moderate and pleasant for the growth and development of all kind of plants. City has black cotton soil and laterite soil. Wild herbs occupy almost all open spaces and grow abundantly. Wild herbs are growing in all types of weather conditions but the rainy season is most productive for their growth. Wild herbs would be of great source of medicines. No serious attempt was made to explore the uses of wild herbs of Bhopal region. Some workers who have contributed in field of medicinal plants with special reference to Madhya Pradesh (1, 2). Oommachan and Masih (3) Some have contributed in the field of ethanbotanical study (4, 5). Tiwari and Yadav (6) worked on ethnobotanical Investigation of some medicinal plants availed by Gond tribe of Naoradehi Wild Life Sanctuary, Madhya Pradesh and find out that 10 species of medicinal plants were recorded among them, which are used for fever, chest pain, bone fracture, headache, vomiting, abortion, snake bite, ear pain, eye pain and ulcer, respectively. Tomar (7) worked on folk medicinal uses of plant root from meerut district, Uttar Pradesh and enumerates 39 genera and 28 families, which are used as folk medicine in the treatment of various diseases by the rural and common people of Meerut district.

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### Methods

Field surveys of different government gardens of Bhopal city were conducted during winter season, rainy season and summer season October 2008 to October 2009). Five localities in Bhopal city were selected i. e. government gardens no. 1 to 5 for study of wild herb distribution.

Sampling was done randomly using 1 × 1 m<sup>2</sup> quadrat. Data regarding frequency, density and abundance of wild herbs were recorded by applying the following formulas (8).

The Frequency of a plant species was determined with the help of the following formula :

$$\text{Frequency (\%)} = \frac{\text{Total no. of quadrat in which the species occur}}{\text{Total no. of quadrat studied}} \times 100$$

The following formula was used for calculating relative frequency of a plants species :

$$\text{Relative Frequency of a species (\%)} = \frac{\text{Frequency of a species}}{\text{Total frequency of all species}} \times 100$$

The Density of a plant species was determined with the help of following formula :

$$\text{Density} = \frac{\text{Total no. of individuals of a species in quadrat studied}}{\text{Total no. of quadrat studied}}$$

**Table 1.** Frequency, density and abundance of wild herbs in gardens of Bhopal city. Rel freq = Relative Frequency, Rel den. = Relative Density, Rel abund. = Relative abundance.

	Name of plant species	Frequency	Rel freq.	Density	Rel dent	Abundance	Rel abundance
1	<i>Ageratum conyzoides</i> Linn.	100	10.1	7.2	1.3	7.2	9.7
2	<i>Cyanadon dactylon</i> (Linn.) Pers	100	10.1	14.6	26.5	14.6	19.8
3	<i>Medicago polymorpha</i> Linn.	80	8.0	7.6	13.8	9.5	7.3
4	<i>Launaea procumbens</i> Roxb.	60	9.3	2.8	12.2	4.6	13.5
5	<i>Eclipta prostrata</i> Linn.	50	7.8	1.6	6.9	3.2	9.4
6	<i>Vernonia cinerea</i> (Linn.) Less.	30	3.0	0.8	1.4	2.6	2.02
7	<i>Dichanthium annulatum</i> Forsk.	70	7.07	2	3.6	2.8	2.17
8	<i>Vicia sativa</i> Linn.	70	7.07	3	5.4	4.2	5.6
9	<i>Melilotus indicus</i> (Linn.) All.	70	7.07	3.7	6.7	5.2	7.0
10	<i>Melilotus alba</i> Desr.	70	7.07	4.8	8.7	6.8	9.2
11	<i>Ipomoea palmata</i> Forsk.	30	3.03	0.5	0.9	1.6	2.17
12	<i>Cyperus rotundus</i> Linn.	30	3.03	0.3	7.3	1.6	10.2
13	<i>Phyllanthus niruri</i> Linn.	60	9.3	2.2	9.6	3.6	10.5

The following formula was used for calculating Relative Density of a plants species :

$$\text{Relative density of a species} = \frac{\text{Density of a species}}{\text{Total Density of all species}} \times 100$$

The Abundance of a plant species is determined with the help of following formula :

$$\text{Abundance} = \frac{\text{Total no. of individuals of the plants species}}{\text{Total no. of quadrats in which the species has occurred}}$$

The following formula is used for calculating Relative Abundance of a plants species :

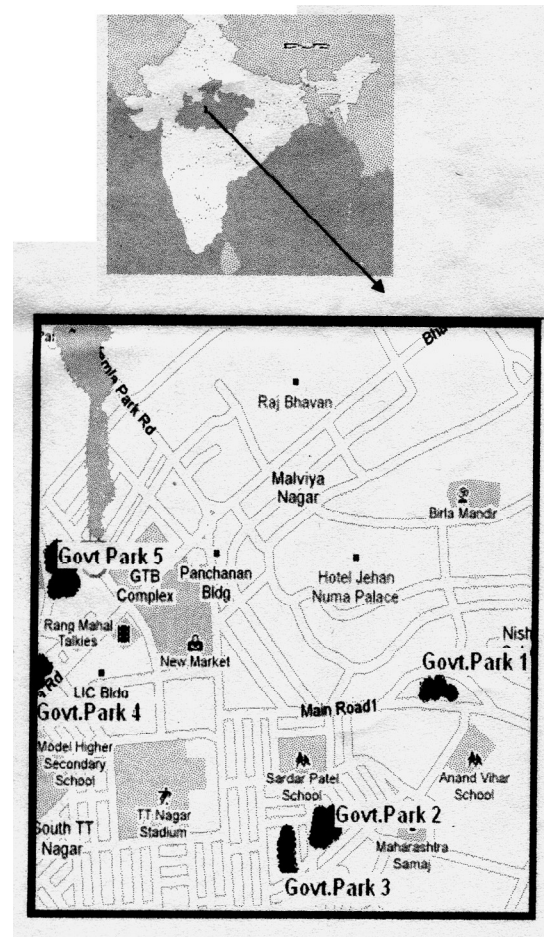
$$\text{Relative abundance of a species} = \frac{\text{Abundance of a species}}{\text{Total abundance of all species}} \times 100$$

**Results and Discussion**

The present study revealed that thirteen wild herbs belonging to seven angiospermic families were found in gardens of Bhopal city, belonging to family Asteraceae, Papilionaceae, Euphorbiaceae, Poaceae, Convolvulaceae and Cyperaceae.

*Vernonia cinerea* (Linn.) Less. and *Cyanadon dactylon* (Linn.) Pers. found in all the five locations showing 100% prevalence, *Medicago polymorpha* Linn. were found in 80% prevalence. Four wild species *Dichanthium annulatum* Forsk., *Vicia sativa*

Linn., *Melilotus indicus* (Linn.) All and *Melilotus alba*



**Figure 1.** Five locations of Bhopal city

Desr. exhibited 70% prevalence each (Table 1). *Launaea procumbens* Roxb. and *Phyllanthus niruri* Linn. with 60% frequency and 9.3% relative frequency was found to be the most frequently occurring wild herb followed by *Eclipta prostrata* Linn. with 50% frequency and 7.8 % Relative frequency. The least frequently occurring species with frequency of 30% *Vernonia cinerea* (Linn.) Less., *Ipomoea palmata* Forsk. and *Cyperus rotundus* Linn. (Table 1).

*Cyanadon dactylon* (Linn.) Pers. and *Medicago polymorpha* Linn. were found to be the most densely and abundantly populated wild herb with 14.6 and 7.6 and relative density of 26.5 and 13.8. and their abundance were 14.6 and 9.5 with 19.8 and 7.8 relative abundance found. These results are in confirmatory with the findings of Mohamed Ali and Krishna Kumar (9).

The wild herbs were found in every location at Bhopal city. Wild herbs have medicinal value. Further study of these wild herb especially phytochemical and pharmacological studies may contribute to development of important pharmaceutical products for future.

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