

# Angiosperm Diversity of Stress Sites of Moradabad district of Rohilkhand Region (Uttar Pradesh)

Beena Kumari<sup>1</sup>, Shiv Pratap Singh<sup>1</sup> and Krishna Kumar Singh<sup>2</sup>

<sup>1</sup>Department of Botany, Hindu College,  
Moradabad, U.P., India

<sup>2</sup>School of Agriculture, Career Point University,  
Kota, Rajasthan, India

## Abstract

Forty-two species of Angiosperms have been recorded from the Sodic soil affected stress sites of Moradabad district in U.P. Herbs accounted for 21 species, shrubs 11 species, undershrub 2 and Trees 2 species whereas Grasses represented by 6 respectively. Poaceae and Euphorbiaceae families have maximum representation in the area with 6 species each. Out of 42 species twelve species are in invasive status namely *Argemonemexicana* L., *Portulacaquadrifida* L., *Sidaacuta* Burm. f., *Urenalobata* L., *Parthenium hysterophorus* L., *Tridaxprocumbens* L., *Xanthumindicum* Koenig, *Calotropisprocera* Ait., *Ipomoea carnea* ssp. *fistulosa* (MartexChoisy) austin, *Ruelliatuberosa* L., *Croton bonplandianum* Baill. and *Euphorbia hirta* L.

**Keywords:** Angiosperms diversity, Stress sites, Invasive, Moradabad district

## 1. Introduction

Moradabad is located at latitude 28.51°N and longitude 78.48°E and at a distance of 167 km [104 miles] from the national capital, New Delhi, on the banks of the **Ramganga River** [a tributary of the Ganges]. The city is famous for brass handicrafts all over the world and is also called "**Brass city**" or **Peetalnagri** [in local language]. The maximum and minimum atmospheric temperatures are 44.2°C and

4°C respectively. The average rainfall varies between 800 to 1000 mm. The relative humidity is up to 90% in monsoon season and in drier part of the year it decreases to less than 20%. The major industries are Brassware, Steelware, Paper mills, Sugar mills, Dye factories, Pharmaceutical, Textile and a number of ancillaries and small scale industries related to these industries. Most of the industries are dumping their effluents in the surrounding areas which changes nutrient status of a particular soil. For the first time, an attempt has been made to document angiosperms diversity of stress sites in Moradabad district (fig 1.) of Rohilkhand region of Uttar Pradesh.

## 2. Materials and Methods

Fields trips were made in Moradabad district during 2015-2016 to collect angiosperms growing around stress sites and available literature by Duthie (1903-1929), Babu (1977), Khanna et al. (1999), Kumar (2001), Srivastava (2004) and Mishra et al. (2015) have been consulted for identification of species. All specimens were dried, preserved (Jain and Rao (1977) and deposited in the Herbarium, Department of Botany, Hindu College, Moradabad (U.P.). In all cases, however the identification was finally confirmed by matching them in the herbarium of the FRI Dehradun and BSI Allahabad. Invasive status was checked as described by Reddy (2008).

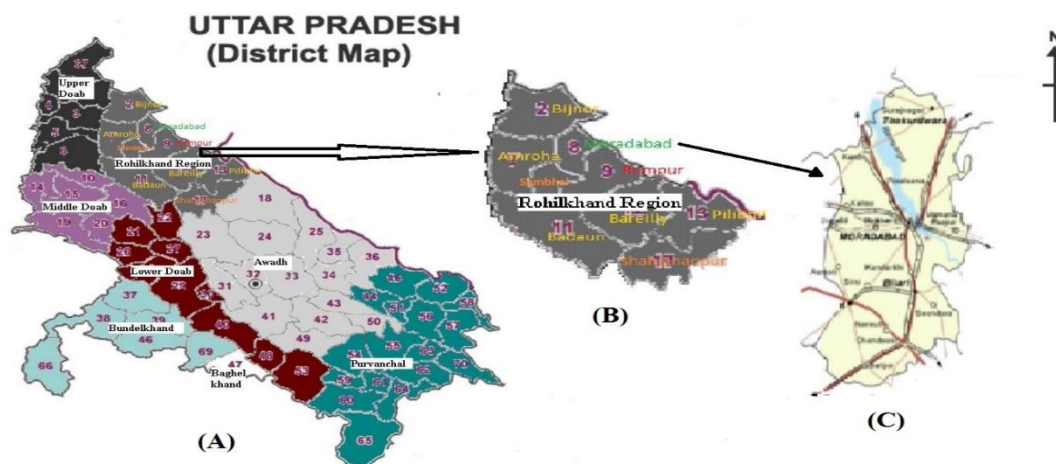


Fig.1 Map of Moradabad district(c)

### 3. Results and Discussion

The present communication is an effort to list angiospermic species growing dominantly in stressed sites of Moradabad. Total 42 species belonging to 21 families are documented in Table 1. Herbs accounted for 21 species, shrubs 11 species, undershrub 2 and Trees 2 species whereas Grasses represented by 6 respectively. Dicots represented by 35 species and monocots by 7 species. Maximum representation was recorded

with Poaceae and Euphorbiaceae families with 6 species each. Out of 42 species twelve species are in invasive status namely *Argemonemexicana* L., *Portulacaquadrifida* L., *Sidaacuta* Burm. f., *Urenalobata* L., *Parthenium hysterophorus* L., *Tridaxprocumbens* L., *Xanthumindicum* Koenig, *Calotropisprocera* Ait., *Ipomoea carnea* ssp. *fistulosa* (MartexChoisy) austin, *Ruelliatuberosa* L., *Croton bonplandianum* Baill. and *Euphorbia hirta* L.

**Table 1.** List of Angiosperms growing in stress sites of Moradabad district

SNo..	Name	Family	Life form	Status
1.	<i>Argemonemexicana</i> L.	Papaveraceae	Herb	Invasive
2.	<i>Fumaria indica</i> (Hausk). Pugsley	Fumariaceae	Herb	Common
3.	<i>Portulacaquadrifida</i> L.	Portulacaceae	Herb	Invasive
4.	<i>Abutilon indicum</i> (L.) Sweet	Malvaceae	Shrub	Common
5.	<i>Sidaacuta</i> Burm. f.	Malvaceae	Herb	Invasive
6.	<i>Urenalobata</i> L.	Malvaceae	Shrub	Invasive
7.	<i>Murrayakoenigii</i> (L.) Spreng.	Rutaceae	Shrub	Common
8.	<i>Zizyphusoenolia</i> (L.) Mill. Gard	Rhamnaceae	Shrub	Common
9.	<i>Abrusprecatorius</i> L.	Fabaceae	Herb	Common
10.	<i>Opuntia elatior</i> Mill.	Cactaceae	Shrub	Common
11.	<i>Parthenium hysterophorus</i> L.	Asteraceae	Herb	Invasive
12.	<i>Tridaxprocumbens</i> L.	Asteraceae	Herb	Invasive
13.	<i>Xanthumindicum</i> Koenig	Asteraceae	Undershrub	Invasive
14.	<i>Alstoniascholaris</i> (L.) R. Br	Apocynaceae	Tree	Common
15.	<i>Calotropisprocera</i> Ait.	Asclepiaceae	Undershrub	Invasive

16.	<i>Ipomoea carnea</i> ssp. <i>fistulosa</i> (MartexChoisy) austin,	Convolvulaceae	Shrub	Invasive
17.	<i>Datura metel</i> L.	Solanaceae	Shrub	Common
18.	<i>Solanumnigrum</i> L.	Solanaceae	Herb	Common
19.	<i>Solanumsurattense</i> Burm. f.	Solanaceae	Herb	Common
20.	<i>Peristrophepaniculata</i> (Forsk) brummitt.	Acanthaceae	Herb	Common
21.	<i>Ruelliatuberosa</i> L.	Acanthaceae	Herb	Invasive
22.	<i>Leucasaspera</i> (Willd) Spreng.	Lamiaceae	Herb	Common
23.	<i>Nepeta hindostana</i> (Roth) Haines.	Lamiaceae	Herb	Common
24.	<i>Achyranthesaspera</i> L.	Amaranthaceae	Herb	Common
25.	<i>Alternanthera sessilis</i> L.	Amaranthaceae	Herb	Common
26.	<i>Amaranthusspinosus</i> L.	Amaranthaceae	Herb	Common
27.	<i>Polygonumplebeium</i> R.Br.	Polygonaceae	Herb	Common
28.	<i>Rumexdentatus</i> L.	Polygonaceae	Herb	Common
29.	<i>Acalyphaindica</i> L.	Euphorbiaceae	Herb	Common
30.	<i>Croton bonplandianum</i> Baill.	Euphorbiaceae	Herb	Invasive
31.	<i>Euphorbiahirta</i> L.	Euphorbiaceae	Herb	Invasive
32.	<i>Euphorbia thymifolia</i> L.	Euphorbiaceae	Shrub	Common
33.	<i>Euphorbianerifolia</i> L.	Euphorbiaceae	Shrub	Common
34.	<i>Ricinuscommunis</i> L.	Euphorbiaceae	Shrub	Common
35.	<i>Ficusvirens</i> Ait.	Moraceae	Tree	Common
36.	<i>Canna indica</i> L.	Cannaceae	Shrub	Common
37.	<i>Arundodonax</i> L.	Poaceae	Grass	Common
38.	<i>Cenchrusciliaris</i> L.	Poaceae	Grass	Common
39.	<i>Cynodondactylon</i> (L.) Pers.	Poaceae	Grass	Common
40.	<i>Desmostachyabipinnata</i> (L.) Stap f.	Poaceae	Grass	Common
41.	<i>Dichanthiumannulatum</i> (Forsk.) Satpf.	Poaceae	Grass	Common
42.	<i>Sachharumbenghalense</i> Retz.	Poaceae	Grass	Common

## References

- [1] Duthie J F, Flora of the Upper Gangetic Plains and of the adjacent Siwalik and sub-himalayan tracts. Calcutta, 1903-1929; Reprinted, (2003).
- [2] Paliwal N K and Singh V P, A contribution to Angiospermic flora of Moradabad dist. U.P. (India). *J. Econ. Taxon. Bot.* 3(3): 851-861, (1982).
- [3] Babu, CR, Herbaceous Flora of Dehradun. CSIR, New Delhi, (1977).
- [4] Khanna KK, Mudgal V, Uniyal P and Sharma JR, Dicotyledonous Plants of Uttar Pradesh- A check list. Bsmmps, Dehradun, (1999).
- [5] Jain SK and Rao RR, A Handbook of field and Herbarium Methods. Today & Tomorrow Printers & Publishers. New Delhi, (1977).
- [6] Kumar S, Flora of Haryana. BSMPS, Dehradun, (2001).
- [7] Mishra AK, Sharma MP and Harbhajan Singh, Angiospermic Flora of Delhi, India: An Updated Checklist. *Indian Journal of Plant Sciences*, 4(3):58-84, (2015).
- [8] Reddy CS, Catalogue of invasive alien flora of India, *Life Sci. J.*, 5(2): 84- 89, (2008).
- [9] Srivastava SK, Floristic diversity in Uttar Pradesh- an overview. *J. Econ. Taxon. Bot.*, 28(2): 292-334, (2004).