



Plant Diversity of Botanical Gardens in Gorakhpur, Uttar Pradesh, India

Prema Kumari J¹., Siddharth P., Pratibha S., Sapna, C., Shobhit K. S. and Jonnada A.V. Prasada Rao*

Department of Biotechnology, Deen Dayal Upadhyaya Gorakhpur University, Gorakhpur, Uttar Pradesh, India

¹St. Ann's College for Women, Malkapuram, Visakhapatnam, Andhra Pradesh

*Corresponding author: drjonnada_avpr@rediffmail.com

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Abstract

Botanical gardens act as a natural antibiotic to treat the ailing environment. The aim of this study is to identify floristic diversity of several parks in Vindawasini Park, Pant Park, Munshi Premchandra Park, Ambedkar Park, Shahid Pandit Ram Prasad Bismil Park and Jawaharlal Nehru Park in Gorakhpur. The results of the present study, a total of 162 species of trees, shrubs and herb collected and identified in the several parks of Gorakhpur regions in Uttar Pradesh. The conclusion of the present study reported that in these regions were observed and identified by very interesting species of 5 species of least concern and 1 endangered species viz. *Platycladus orientalis* (L.) Franco, *Delonix regia* (Boj.ex Hook.) Raf., *Cycas revoluta* Thunb., *Alistonia scholaris* (L.) R.Br., *Chamaerops humilis* L., *Swietenia mahagoni* (L.) Jacq., *Tabernaemontana corymbosa* Roxb.ex. Wall. and *Eclipta prostrata* L.

Key words: Botanical garden, Parks, Biodiversity, Gorakhpur, Uttar Pradesh.

1. INTRODUCTION

India, a mega diversity country with only 2.4% of the land area, accounts for 7-8% of the recorded species of the world spread over 45,500 species of plants that have been documented so far. According to IUCN Red list 2008 Indian, Flora 247(2.9%) species are rare and threatened. Of these 109 species that include many medicinal plants are endangered ones or facing extinction due to biotic and anthropogenic factors. The conservation of the forest and other wild plant species is often carried out through protected areas such as national parks, gene sanctuary and nature reserves (MoEF, 2008). As far as Uttar Pradesh is concerned, the province does not have any checklist or a flora of its own since the publication of 'Flora of the Upper Gangetic Plains' by Duthie [1]. After, Duthie [1], several district floras and other publications have been brought out by different workers on plant diversity of Uttar Pradesh. However, a separate assessment exclusively devoted to all tree wealth of the entire province in general and Gorakhpur in particular has not been done so far. The present investigation was undertaken to enumerate the flora of the Botanical gardens or parks which endow with rich diversity. Here an attempt was made first to enumerate plant diversity in Vindawasini Park, Pant Park, Munshi Premchandra Park, Ambedkar Park, Shahid Pandit Ram, Prasad Bismil Park and Jawaharlal Nehru Park in Gorakhpur, Uttar Pradesh, India.

2. MATERIALS AND METHODS

2.1 Study sites

The study area of seven parks of Vindawasini Park, Pant Park, Munshi Premchandra Park, Ambedkar Park, Shahid Pandit Ram, Prasad Bismil Park and Jawaharlal Nehru Park in Gorakhpur. Gorakhpur is a city along the banks of Rapti River in the eastern part of the state of Uttar Pradesh in India, near the Nepal border (Fig.1). It is the administrative headquarter of Gorakhpur District and Gorakhpur Division. The district of Gorakhpur lies between Lat. 26°13'N and 27°29'N and Long. 83°05'E and 83°56'E.

The district occupies the north-eastern corner of the state along with the district of Deoria, and comprises a large stretch of land lying to the north of the river Rapti, which forms the southern boundary with the Azamgarh district. Ambedkar Nagar district on the west Basti and east adjoins Deoria and the Chhoti Gandak Nadi and further south the Jharna Nala forms the dividing line.

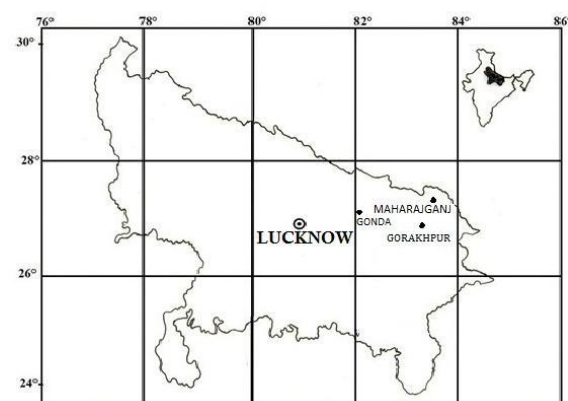


Fig.1: Study area

To the north it meets with Maharajganj, Padrauna and Nepal. Interestingly Gorakhpur endowed with beautiful and green stretches of parks and Gardens with rich floral diversity. The famous parks of Gorakhpur are Vindawasini Park (V-Park), Pant Park, Munshi Premchandra Park, Ambedkar Park, Shahid Pandit Ram Prasad Bismil Park., Jawaharlal Nehru Park (Lal Diggi Park).the survey was conducted to enumerate the entire plant species spread over the several parks mentioned above during January to February, 2019. The present data is outcome of field work carried out in famous parks of Vindawasini Park (V-Park), Pant Park, Munshi Premchandra Park, Ambedkar Park, Shahid Pandit Ram Prasad Bismil Park and, Jawaharlal Nehru Park (Lal Diggi Park) in Gorakhpur Uttar Pradesh, India. The identification of plants in the parks was made with the help of manuals and monographs, “Flora Gorakhpurensis”[2].

3. RESULTS AND DISCUSSION

The results of the floral diversity of selected parks of Gorakhpur observed and identified in the 162 species. 79 species of trees and 83 species of herbs and shrubs were identified in these regions (Table-1 and 2).

Table 1 : Enumeration of Trees

S. No.	Plant	Family	Local name
1	<i>Mangifera indica</i> L.	Anacardiaceae	Aam
2	<i>Phyllanthus emblica</i> L.	Phyllanthaceae	Amala / Awla
3	<i>Polyalthia longifolia</i> Sonn.	Annonaceae	Ashok
4	<i>Tectona grandis</i> L.f.	Lamiaceae	Sagaun
5	<i>Psidium guajava</i> L.	Myrteaceae	Amrood
6	<i>Ficus religiosa</i> L.	Moraceae	Peepal
7	<i>Azadirachta indica</i> A.Juss.	Meliaceae	Neem
8	<i>Mimosa pudica</i> L.	Sapotaceae	Maulshree
9	<i>Roystonea regia</i> (Kunth) O.F. Cook.	Arecaceae	Royal Palm
10	<i>Plumeria rubra</i> L.	Apocynaceae	Gulchin
11	<i>Nyctanthes arbor-tristis</i> L.	Oleaceae	Harshingar
12	<i>Aegle marmelos</i> L.	Rutaceae	Bel
13	<i>Ficus benghalensis</i> L.	Moraceae	Bargad
14	<i>Trema tomentosa</i> Planch. & Hewson.	Cannabaceae	Poison peach/Jhau
15	<i>Grevillea robusta</i> A.Cunn ex R. Br.	Proteaceae	Silver oak
16	<i>Platycladus orientalis</i> (L.) Franco	Cupressaceae	Oriental thuja
17	<i>Thevetia peruviana</i> (L.) Lippold	Apocynaceae	Yellow oleander
18	<i>Artocarpus lacucha</i> Buch-Ham.	Moraceae	Barhar
19	<i>Punica granatum</i> L.	Lythraceae	Anar
20	<i>Dysoxylum</i> (H. Wendl.) Beentje & J. Dransf.	Arecaceae	Areca palm
21	<i>Melia azadirachta</i> L.	Meliaceae	Bakain/Mithineem
22	<i>Nerium oleander</i> L.	Apocynaceae	Kaner
23	<i>Delonix regia</i> (Boj. ex Hook.) Raf.	Fabaceae	Gulmohar
24	<i>Phoenix dactylefera</i> L.	Arecaceae	Date palm
25	<i>Cassia fistula</i> L.	Fabaceae	Amaltash
26	<i>Albizia lebbek</i> (L.) Benth	Fabaceae	Siris



27	<i>Cycas revoluta</i> Thumb.	Cycadaceae	Sago palm
28	<i>Bauhinia variegata</i> (L.) Benth.	Fabaceae	Kachnar
29	<i>Melaleuca citrine</i> (Curtis) Dum. Cours.	Myrtaceae	Bottle brush
30	<i>Dalbergia sissoo</i> Roxb.	Fabaceae	Shisam/sissoo
31	<i>Millettia pinnata</i> (L.) Panigrahi	Fabaceae	Karwyani
32	<i>Lagerstroemia indica</i> (L.) Pres.	Lythraceae	Sawani
33	<i>Ficus virens</i> Aiton.	Moraceae	Pakad
35	<i>Morus alba</i> L.	Moraceae	Shahtut
36	<i>Syzygium cumini</i> L.	Myrtaceae	Jamun
37	<i>Grevillea robusta</i> A. Cunn.	Malvaceae	Phalsa
38	<i>Artocarpus heterophyllus</i> Lam.	Moraceae	Kathal
39	<i>Musa paradisiaca</i> L.	Musaceae	Banana
40	<i>Carica papaya</i> L.	Caricaceae	Papaya
41	<i>Morus nigra</i> L.	Moraceae	Black mulberry
42	<i>Ficus elastica</i> Roxb. Ex Hornem.	Moraceae	Indian Rubber
43	<i>Alistonia scholaris</i> (L.) R. Br.	Apocynaceae	Chitwan
44	<i>Bombax ceiba</i> L.	Bombaceae	Semul/Salmali
45	<i>Madhuca indica</i> (J. König) J. F. Macbr.	Sapotaceae	Mahua
46	<i>Ziziphus mauritiana</i> Lamk.	Rhamnaceae	Ber
47	<i>Trema orientalis</i> Lour.	Cannabaceae	Jivan
48	<i>Mitragynaparvifolia</i> (Roxb.) Korth.	Rubiaceae	Kadam
49	<i>Saraca asoca</i> (Roxb.) Willd.	Fabaceae	Sitaashok
50	<i>Chamaerops humilis</i> L.	Arecaceae	Fan palm
51	<i>Annona squamosa</i> L.	Annonaceae	Sarifa
52	<i>Eucalyptus citriodora</i> Hook.	Myrtaceae	Safeda
53	<i>Bambusa vulgaris</i> Schrad. ex J. C. Wendl.	Poaceae	Bamboo
54	<i>Sennasiamea</i> (Lam.)	Fabaceae	Kasood
55	<i>Litchi chinensis</i> Sonn.	Sapindaceae	Litchi
56	<i>Casurina equisetifolia</i> L.	Casuraniaceae	Jangalisaru
57	<i>Citrus medica</i> L.	Meliaceae	Nimbu
58	<i>Prosopis cineraria</i> (L.)	Mimosodeae	Shami
59	<i>Tecoma stans</i> L.	Bignoniaceae	Yellow bells
60	<i>Caryota urens</i> L.	Arecaceae	Fish tail palm
61	<i>Cassia multijuga</i> Rich.	Fabaceae	Cassia
62	<i>Murraya koenigii</i> (L.)	Rutaceae	Curry patta
63	<i>Cocos nucifera</i> L.	Arecaceae	Coconut
64	<i>Brownea grandiceps</i> Jacq.	Fabaceae	Browenia
65	<i>Pterospermum acerifolium</i> (L.)	Sterculiaceae	Kanak champa
66	<i>Terminalia arjuna</i> (Roxb.) Wight & Arn.	Combretaceae	Arjun
67	<i>Averrhoa carambola</i> L.	Oxalidaceae	Kamrakh
68	<i>Putranjiva roxburghii</i> Wall.	Putranjivaceae	Putra jivika
69	<i>Swietenia mahagoni</i> (L.) Jacq.	Meliaceae	Mahogany
70	<i>Araucaria heterophylla</i> Pav.	Araucariaceae	Christmas tree
71	<i>Ficus benamina</i> L.	Moraceae	Puker
72	<i>Tabernaemontana divaricata</i> R. Br.	Apocynaceae	Chandani
73	<i>Magnolia champaca</i> (L.)	Magnoliaceae	Swarnchampa
74	<i>Caryota urens</i> L.	Arecaceae	Wine palm
75	<i>Syzygium cumini</i> (L.) Skeels.	Myrtaceae	Gulabjamun
76	<i>Magnolia grandiflora</i> L.	Magnoliaceae	Thalkamal
77	<i>Psidium cattleianum</i> Sabine.	Myrtaceae	China amrood
78	<i>Flacourtia indica</i> (Burm. f.) Merr.	Salicaceae	Paniyala
79	<i>Ficus krishnae</i> (Linn.) DC.	Moraceae	Makhankatori



Table 2: Enumeration of Herbs and Shrubs

S.no.	Herbs&Shrubs	Family	Local name
1	Hibiscus rosa-sinensis L.	Malvaceae	Gurhal
2	Bougainvillia spectabilisComm.exJuss.	Nyctaginaceae	Bougainvillia
3	Mazus pumalis(Burm.f.)Steenis.	Scrophulariaceae	Asian mazus
4	Gnaphillum luteoalbum L.	Asteraceae	Cudweeds
5	Blumea balsamifera(L.)DC.	Asteraceae	Sambong
6	Oxalis corniculata L.	Oxalidaceae	Yellow woodsorrel
7	Vernonia ceneria(L.)Less.	Asteraceae	Sadodi
8	Cynodon dactylon(L.)Pers.	Poaceae	Indian doab
9	Brassica compestris L.	Crucifereae	Field mustard
10	Chenopodium album L.	Amaranthaceae	Bathua
11	Ageratum conyzoides L.	Asteraceae	Jungalipudina
12	Euphorbia hirta L.	Euphorbiaceae	Bara dudhi
13	Cyprus sp. L.	Cyperaceae	Dwarf umbrella-sedge
14	Parthenium hysterophorus L.	Asteraceae	Congress grass
15	Eragrostis pilosa(L.)P.Beauv.	Poaceae	Indian Love grass
16	Launean udicaulis	Asteraceae	Bhatal
17	Amaranthus viridis L.	Amaranthaceae	Green Amaranth
18	Kyllinga tricepsRottb.	Cyperaceae	Spike sedges
19	Juniperus sp. L.	Cupressaceae	Juniperus
20	Acalypha indica L.	Euphorbiaceae	Kuppi
21	Solanaum nigrum L.	Solanaceae	Makoi
22	Spilanthes acmella L.	Asteraceae	Akarkar
23	Veronica anagalis-aquatica L.	Plantaginaceae	Speed well
24	Rumex dentatus L.	Polygonaceae	JungliPalak
25	Cannabis sativa L.	Cannabaceae	Bhang
26	Calotropis procera (Ait.)R.Br.	Asclepidaceae	Madar
27	Urena lobata L.	Malvaceae	Congo jute
28	Clerodendron infortunatum Auct.	Verbenaceae	Bhatwas
29	Duranta repens Linn.	Verbenaceae	Neel kanta
30	Gardenia jasminoidesJ.Ellis.	Rubiaceae	Gandhraj
31	Ageratum houstoniaum Mill.	Asteraceae	Gandhjhar
32	Trigonella foenumgraecum L.	Fabaceae	Methi
33	Vicia faba L.	Fabaceae	Bakla
34	Silybum marianum (L) Gaertn.	Asteraceae	Milk thistle
35	Malvestrum coromandelianum (L.)Garcke.	Malvaceae	Kharenti
36	Sida acutaBurm. f.	Malvaceae	Bariyar
37	Ranunculus scellaratus Linn.	Ranunculaceae	Jaldhenia
38	Achyranthus aspera L.	Amaranthaceae	Apamarg
39	Pauzolzoia zeylanica (Poir.) Gaudich.	Urticaceae	Oyik
40	Digitaria sp.	Poaceae	Crab grass
41	Elusine spp.		
42	Rungia pectinata (L.) Nees	Acanthaceae	Kharmor
43	Evolvulus alsinoides L.	Convolvulaceae	Visnukrantha
44	Calliandra haematocephalaHassk.	Fabaceae	Red Puff
45	Sonchus oleraceus L.	Asteraceae	Sow Thistle
46	Tridax procumbense	Asteraceae	Coat button
47	Dodonaea sp. Mill.	Sapindaceae	Hop bushes
48	Tabernaemontana corymbosaRoxb. ex Wall.	Apocynaceae	Chandani
49	Melilotus indicus (L.) All.	Fabaceae	Sweet clover
50	Eclipta prostrate L.	Asteraceae	Bhringraj
51	Euphorbia parviflora Linn.	Euphorbiaceae	Dandathaur
52	Cardamine hirsuta L.	Brassicaceae	Hairy bittercress
53	Solanum lycopersicum L.	Solanaceae	Tomato



54	<i>Thuja occidentalis</i> L.	Cupressaceae	Morpankhi
55	<i>Murraya paniculata</i> (L.) Jack	Rutaceae	Manokamini
56	<i>Senna occidentalis</i> (L.) Link	Fabaceae	Chakwad
57	<i>Iberis amara</i> L.	Brassicaceae	Candytuft
58	<i>Mirabilis jalapa</i> L.	Nyctaginaceae	Four 'O' clock
59	<i>Scoparia dulcis</i> L.	Scrophulariaceae	GhodaTulsi
60	<i>Peristrophebi calyculata</i> (Retz) Nees	Acanthaceae	Kali anghedi
61	<i>Justicia gendarussa</i> Burm. f.	Acantahceae	Kala adulasa
62	<i>Dendrophthoe falcate</i> (L.f.)Ettingsh	Loranthaceae	Bana
63	<i>Oldenlandia gracilis</i> Hk.f.	Rubiaceae	Paperbhed
64	<i>Phyllanthus niruria</i> auct. Non Linn.	Euphorbiaceae	Bhumiamla
65	<i>Boerhavia diffusa</i> L.nom.cons	Nyctaginaceae	Punarnava
66	<i>Anagallis arvensis</i> L.	Primulaceae	Nili
67	<i>Nicotiana plumbiginifolia</i> Viv.	Solanaceae	JungliTambako
68	<i>Crinum asiaticum</i> L.	Amaryllidaceae	Spider lili
69	<i>Oxalis debilis</i> Kunth.	Oxalidaceae	Pink Sorrel
70	<i>Calandula officinalis</i> L.	Asteraceae	Pot marigold
71	<i>Plectranthus scutellarioides</i> (L.) R.Br.	Lamiaceae	Coleus
72	<i>Dracaena Vand.ex</i> L.	Asparagaceae	Dracaena
73	<i>Sansevieria</i> sp. Thunb.	Asparagaceae	Mother -in -law's Tongue
74	<i>Pedilanthus tithymaloides</i> L.	Euphorbiaceae	Vilaytisher
75	<i>Bryophyllum pinnatum</i> (Lam.) Oken.	Crassulaceae	Air plant
76	<i>Ixora coccinea</i> L.	Rubiaceae	Ixora
77	<i>Desmodium gangeticum</i> (L.) DC.	Fabaceae	Shalaparni
78	<i>Sida cordifolia</i> L.	Malvaceae	Flannel weed
79	<i>Triumfetta rhomboidea</i> Roth.	Malvaceae	Chikti
80	<i>Ichnocarpus frutescens</i> (L.) W.T.Aiton.	Apocyanaceae	Siamlata
81	<i>Argemone maxicana</i> L.	Papaveraceae	Satynashi
82	<i>Abutilon indicum</i> (Link.) Sweet	Malvaceae	Aatibala
83	<i>Jasminium elongatum</i> f.	Oleaceae	Red kund

N.B: V P: Vindawasini Park (V-Park), P P: Pant Park, M.P: Munshi Premchandra Park, A P: Ambedkar Park, B P: Shahid Pandit Ram Prasad Bismil Park. LP: Jawaharlal Nehru Park (Laldiggi Park), (+): Present, (-): Absent

In these regions were very interesting species identified in rare and endangered species such as *Platyclusus orientalis* (L.) Franco, *Delonix regia* (Boj.ex Hook.)Raf., *Cycas revoluta* Thunb., *Alistonia scholaris* (L.) R.Br., *Chamaerops humilis* L., *Swietenia mahagoni* (L.) Jacq., *Tabernaemontana corymbosa* Roxb.ex. Wall. and *Eclipta prostrata* L. (Table-3). According to Oimahmad Rahmonov et al.,[3] reported that occurrences of 426 plants in city parks in southern Poland. Parks are an important element of green areas of cities and serve various purposes such as recreation, health and social functions and improving the condition of the urban environment [4]. The highest numbers of species are observed and identified by the park of Grabek and the least number of species was found in the park of Zielona. The vast majority of

taxa are represented by the following botanical families viz. Asteraceae (30), Poaceae (24), Rosaceae (15), Fabaceae (12), Caryophyllaceae (10), Brassicaceae (11), Apiaceae (10), Lamiaceae (9) and Pinaceae (6). The most species are represented by the genera Aster and Poa. The conclusion of the report is higher number of plant species found in the Grabek park for the reason of less human activities.

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