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Diversity and status of unani medicinal plants species of Delhi flora

[1] Anand Kumar Mishra, [1] Maheshwar Prasad Sharma, [1] Mohhamad Imran Khan, [2] Harbhajan Singh
[1] Department of Botany, Jamia Hamdard, Hamdard Nagar, New Delhi-110062, India.
[2] National Institute of Science Communication and Information Resources (NISCAIR) Dr. KSK Marg, New Delhi, India.

Abstract
A survey was conducted to study the diversity and status of plant species in Delhi province and 604 plant species have been documented. Among this 135 plants consist to the Unani system of medicine under115 genera representing to 50 families are discussed in the present paper with their diversity and status. Based on the distribution status of the Unani medicinal plants, it is categorized as common, Infrequent (Occasional), rare, and new records. Those plants falls under the rare category are recommended for germplasm collection and to take up cultivation and propagation activities through modern agronomical techniques.

Keywords: Wild plant, Status, Diversity, Unani Medicinal plants.

1. Introduction

Medicinal plants have been used since prehistoric period for the cure of various diseases. Since these are in common use by the local people and are of great importance that's why a lot of people are engaged in the trade of important medicinal herbs throughout the world [6]. Especially, people living in villages have been using indigenous plants as medicines since ages because this knowledge transfers from generation to generation and is based on lifelong experiences. Besides, the villages are far away from cities and mostly lack proper health facilities [19]. In India, about 25000 plant based formulations are used in traditional medicines and about 20,000 medicinal plants have been recorded but only 7000-7500 plants are used by the traditional practitioners for curing various disorders [17].

Macro analysis of the distribution shows that medicinal plants are distributed in diverse habitats, with around 70 per cent of the resource are found in the Indian Sub-Continent spread over Western and Eastern Ghats, the Vindhyas, Chotta Nagpur Plateau, Aravallis, the Terai Region in the foothills of the Himalayas and the North-East. Less than 30 per cent of the medicinal plants are found in the temperate forest and higher altitudes. Micro-ecological studies show that larger percentages of medicinal plants are occurring in dry and moist deciduous forest as compared to the evergreen or temperate forests [9].

Traditional medicine is widely and increasingly being used in both developing and developed countries. Up to 80% of the population in Africa and 65% in India depend on traditional medicine to help meet their healthcare needs[8]. Population of rural areas of totally depends on biodiversity for their food, fuel, fodder, clothing, timber, medicines and other purposes. According to WHO, 80% of the world population depends on herbal medicines for their health care, especially in developing countries [20].The floral diversity is under various threats due to over exploitation and increased demand of herbal raw material in pharmaceutical industrialization, habitat destruction and climate changes.

India has six recognized systems of medicine i.e. Ayurveda, Siddha, Unani, Yoga, Naturopathy and Homoeopathy. This country has rich wealth of important medicinal flora due to variable climatic conditions. Plants are also used in the number of modern medicines [18]. The Unani system of medicine originated in Greece and believed to have been established by Hippocrates (460-377 BC). Hippocrates is known as the father of this system of medicine. This system of medicine has been introduced by the Arabs in India. Unani system of medicine is practiced in India, Pakistan, Bangladesh and Sri Lanka. According to the principles of Unani medicine, disease is a natural process and its symptoms are the reactions of the body to the disease. Unani medicine is based on the 'Humoral Theory'. Disease occurs whenever the balance of humors is disturbed. In Unani medicine, single drugs or their combinations in raw forms are preferred over compound formulations [2, 18].

The World Health Organization (WHO) has recognized the Unani system of Medicine as an alternative system to cater the health care needs of human population. The principal source of drugs in the Unani system of medicine are plant origin drugs, Animal origin drugs and Mineral origin drugs. The Unani pharmacopoeia has a rich armamentarium of natural drugs, consisting of mostly herbal in addition to materials of animal, mineral and marine origin. There are over 2000 species of plants mentioned in Unani Materia Medica, in which many species occurring in lndia found a place [9].

Delhi is located in northern India between the latitudes of 28°-24'-17" and 28°- 53'-00" North and longitudes of 76°-50'-24" and 77°-20'-37" East. Delhi shares borders with the States of Uttar Pradesh and Haryana. Delhi has an area of 1,483 sq. Kms. Its maximum length is 51.90 kms and greatest width is 48.48 kms. Monsoon arrives in Delhi in the last week of June or first week of July. The average annual rainfall in is 66.6 cm. Delhi contains mean annual maximum temperature is 46 ^{0}C as well minimum is 4 ^{0}C due to which December is coldest and June is hottest month. The Ridge of Delhi and its neighbouring hill tracts represent the characteristic, natural flora of the state, which is a tropical, thorny, secondary forest, commonly known as 'rakhs' or an arid, open, scrub forest [12].

Yamuna River flows 48 km^2 in Delhi region and occupied 97 km^2 of total geographical of this city [16].

2. Material and methods

A survey of various parts of Delhi state was conducted from (2011-2015) with special emphasis on following regions- Delhi Ridge, Yamuna river bank, agricultural fields, forest, wasteland, railway line, road-sides etc. During the investigation regular field trips were undertaken in monsoon, late monsoon, winter and summer due to the availability of different plants in the seasons. The plant specimens collected during field visits were pressed and dried using blotting papers for about two to three weeks at room temperature. The collected plant specimens were dipped in the solution of 2% mercuric chloride for 15-20 minutes in order to provide protection against insects and fungal attack. After poisoning, the plants were mounted on the herbarium sheets. The plants were indentified with help of the help of earlier published literatures such as, *The Flora of Delhi* [12], *Illustrations of the Flora of Delhi* [13], *Flora of Haryana* [10], *Flora of North Western Himalaya* [7], *Herbaceous flora of Dehradun* [4], Taxonomy experts of Institute of Science Communication and Information Resources (NISCAIR), New Delhi. Each plant has been arranged as per Bentham and Hooker's System of classification. Nomenclature update of the specimens was based on the basis of Angiosperm Phylogeny Group (APG) classification [3] and Plant list [22]. The specimens have been deposited in the Department of Botany, Jamia Hamdard, New Delhi, India. All the plant specimens were arranged alphabetically and enumerated along with their Botanical name, Family name, Local name, Unani name, status. Some Unani name are taken earlier published literatures [5; 11; 21]. A checklist has been prepared after comparing with the existing literatures of Unani System of Medicine and especially with the list of medicinal plant used in Unani System of Medicine, given in Hamdard Pharmacopoeia of Eastern Medicine[1]

3. Result & Discussion

In our study, we have documented 604 species belongs to 399 genera representing 92 families. In present study, we mainly focused on wild plant species not on cultivated species. This is attempt to prepare a checklist of Unani medicinal plant species of Delhi, according to diversity and status point of view. This is first list of Unani medicinal plants on the basis of Status. Out of 604 plant species; 135 plants are used in Unani system of Medicine (Table 1).

Table 1: Enumeration of Unani Medicinal Plants in Flora of Delhi, India.

S. No.	Plant name	Family	Local Name	Unani Name	Habit	Status
1	***Abrus precatorius*** L.	Fabaceae	*Rati*	*Koonch; Gungchi*	Cl.	Inf.
2	***Abutlion indicum*** L. Sweet.	Malvaceae	*Kanghi*	*Kanghi*	S.	C.
3	***Acacia catechu*** Willd.	Fabaceae	*Katha*	*Kattha; Khair*	T.	Inf.
4	***Acacia nilotica*** (L.) Delile.	Fabaceae	*Babul*	*Babul*	T.	C.
5	***Acalypha indica*** L.	Euphorbiaceae	*Kuppi*	*Kuppi*	H.	C.
6	***Achyranthes aspera*** L. var. ***porphyristachya*** Hook.	Amaranthaceae	*Chirchita*	*Chirchita*	H.	C.
7	***Aegle marmelos*** L. Correa	Rutaceae	*Belpatra*	*Belgiri*	T.	Inf.
8	***Aerva lanata*** (L.) Juss.	Amaranthaceae	*Gedua ki chal*	*Bisheributi*	H.	C.
9	***Ailanthus excelsa*** Roxb.	Simaroubaceae	*Ulloo*	*Neem Mitha*	T.	C.
10	***Albizia lebbeck*** (L.) Benth.	Fabaceae	*Siris*	*Tukhm-e-Siran*	T.	C.
11	***Alhagi marorum*** Medik.	Fabaceae		*Jawasna; Turanjabeen*	S.	Inf.
12	***Alstonia scholaris*** (L.) R. Br.	Apocynaceae	*Chhatwan*	*Kashim; Sattoona*	T.	C.
13	***Amaranthus spinosus*** L.	Amaranthaceae	*Kateli Chaurai*	*Chauli Khardar*	H.	C.
14	***Andrographis paniculata*** (Burm. f.) Nees.	Acanthaceae	*Kalmegh*	*Kal-megh*	H.	Inf.
15	***Argemone mexicana*** L.	Papaveraceae	*Unkatera*	*Satyanasi*	H.	C.
16	***Asparagus racemosus*** Willd.	Asparagaceae	*Satavar*	*Satawar, Shaqaqual Misri*	S.	Inf.
17	***Asphodelus tenuifolius*** Cav.	Xanthorrhoeaceae	*Piazi*	*Gandana*	H.	Inf.
18	***Azadirachta indica*** A. Juss.	Meliaceae	*Neem*	*Neem*	T.	C.
19	***Bacopa monnieri*** (L.) Wettst.	Plantaginaceae	*Neem-jal*	*Ulasimang-aso*	H.	Inf.
20	***Balanites roxburghii*** Planch.	Zygophyllaceae	*Hingot*	*Hingot*	T.	C.
21	***Barleria priontis*** L.	Acanthaceae	*Kala bansa*	*Pia Bans*	S.	R.
22	***Basella alba*** L.	Basellaceae	*Poi*	*Poi*	H.	Inf.
23	***Bauhinia tomentosa*** L.	Fabaceae		*Kachnar*	S.	C.
24	***Bauhinia variegata*** L.	Fabaceae	*Kachnar*	*Kachnal*	T.	C.
25	***Blumea lacera*** (Burm. f.) DC.	Asteraceae		*Kakronda*	H.	C.
26	***Boerhavia diffusa*** L.	Nyctaginaceae	*Punarnava*	*Theekri; Handakaku*	H.	Inf.
27	***Bombax ceiba*** L.	Malvaceae	*Semal*	*Senbhal, Mochras*	T.	C.
28	***Butea monosperma*** (Lamk.) Taub.	Fabaceae	*Palash*	*Dhak (Pilas Papra)*	T.	Inf.
29	***Caesalpinia crista*** L.	Fabaceae	*Karkonda*	*Karanjawa*	S.	Inf.
30	***Calotropis procera*** (Aiton) W. T. Aiton	Apocynaceae	*Madar, Aak*	*Madar*	S.	C.
31	***Cannabis sativa*** L.	Cannabinaceae	*Bhang*	*Bhang; Charas; Ganja*	H.	C.
32	***Capparis decidua*** (Forssk.) Edgew.	Capparaceae	*Kair*	*Teent*	T.	Inf.
33	***Capparis sepiaria*** L.	Capparaceae	*Heens*	*Kanthari*	S.	C.
34	***Carica papaya*** L.	Caricaceae	*Papita*	*Arand Kharbuza*	T.	Inf.
35	***Cassia fistula*** L.	Fabaceae	*Amaltas*	*Amaltas*	T.	C.
36	***Catharanthus roseus*** (L.) G. Don	Apocynaceae	*Sadabahar*	*Sadabahar*	H.	Inf.

37	***Centella asiatica*** (L.) Urb.	Apiaceae	*Jal brahmi*	*Brahmi*	H.	Inf.
38	***Chamaecrista absus*** **(**L.) H.S. Irwin & Barneby [14]	Fabaceae		*Chaksu*	H.	NR
39	***Chenopodium album*** L.	Amaranthaceae	*Bathua*	*Bathua*	H.	C.
40	***Chrozophora plicata*** (Vahl) A. Juss. ex Spreng.	Euphorbiaceae		*Neelkanthi*	H.	Inf.
41	***Chryspogon zizanioides*** (L.) Roberty	Poaceae	*Gandar, Jhaund, Khas ghars*	*Khas*	G.	R.
42	***Cichorium intybus*** L.	Asteraceae	*Kasni*	*Kasni*	H.	Inf.
43	***Cissampelos pareira*** L.	Menispermaceae	*Jaljamini*	*Patha*	S.	Inf.
44	***Citrullus colocynthis*** (L.) Schard.	Cucurbitaceae	*Indrayan*	*Hanzal*	H.	Inf.
45	***Citrus aurantiifolia*** (Christm.) Swingle	Rutaceae	*Kaghizi nimbu*	Leemu kaghzi	T.	Inf.
46	***Citrus maxima*** (L.) Merr.	Rutaceae	*Chakotra*	*Chakotra*	T.	Inf.
47	***Cleome gynandra*** L.	Cleomaceae	*Hurhul*	*Tilvan*	H.	Inf.
48	***Cleome viscosa*** L.	Cleomaceae	*Hurhul*	*Bantakalan*	H.	C.
49	***Coccinia grandis*** (L.) Voigt	Cucurbitaceae	*Kundru*	*Kanduri*	S.	C.
50	***Corchorus depressus*** (L.) Stocks	Malvaceae		*Bhophali*	H.	Inf.
51	***Crateva nurvala*** Buch.-Ham.	Capparaceae	*Berna*	*Barna*	S.	Inf.
52	***Cucumis sativus*** L.	Cucurbitaceae	*Khira*	*Kakri; Khira*	H.	C.
53	***Cuscuta reflexa*** Roxb.	Convolvulaceae	*Bari Amarbel*	*Tukhm-e-Kasoos*	P.	C.
54	***Cynodon dactylon*** (L.) Pers.	Poaceae	*Doob*	*Kabbar*	G.	R.
55	***Cyperus rotundus*** L.	Cyperaceae	*Motha*	*Sad kufi*	Se	C.
56	***Dalbergia sissoo*** Roxburgh ex Candolle	Fabaceae	*Sheesham*	*Sheesham*	T.	C.
57	***Datura metel*** L.	Solanaceae	*Kala datura*	*Tukhm Dhatura*	H.	Inf.
58	***Echinochloa crus-galli*** (L.) P. Beauv.	Poaceae	*Sarna*	*Samak*	G.	C.
59	***Echinops echinatus*** Roxb.	Asteraceae	*Oontkatela*	*Untkatara*	H.	C.
60	***Eclipta prostrata*** (L.) L.	Asteraceae	*Bhringraj*	*Bhangra*	H.	C.
61	***Euphorbia hirta*** L.	Euphorbiaceae	*Dudhi*	*Dudhi Kalan*	H.	C.
62	***Evolvulus alsinoides*** (L.) L.	Convolvulaceae	*Shankh pushpi*	*Sankhavli*	H.	Inf.
63	***Feronia limonia*** (L.) Swingle	Rutaceae	*Kaith*	*Kaith*	T.	R.
64	***Ficus benghalensis*** L.	Moraceae	*Bargad*	*Bargad*	T.	C.
65	***Ficus racemosa*** L.	Moraceae	*Gular*	*Goolar*	T.	Inf.
66	***Ficus religiosa*** L.	Moraceae	*Peepal*	*Pipal*	T.	C.
67	***Fumaria indica*** (Hausskn.) Pugsley	Papaveraceae	*Pittpapra*	*Shahtra*	H.	C.
68	***Holoarrhena pubescens*** Wall. ex. G. Don	Apocynaceae	*Kurchi*	*Inderjo Tulkh*	T.	R.
69	***Indigofera tinctoria*** L.	Fabaceae		*Neel*	S.	C.
70	***Ipomoea aquatic***a Forssk.	Convolvulaceae	*Nari Ka sag*	*Kalmisak*	Cl.	C.
71	***Ipomoea nil*** (L.) Roth	Convolvulaceae	*Nilkalmi*	*Kaladana*	Cl.	C.
72	***Justicia adhatoda*** L.	Acanthaceae	*Bansa*	*Arusa*	S.	Inf.
73	***Lathyrus sativus*** L.	Fabaceae		*Lakh*	H.	C.
74	***Lawsonia inermis*** L.	Lythraceae	*Mehndi*	*Hina*	S.	Inf.
75	***Leucas aspera*** (Willd.) Link	Lamiaceae	*Gopha*	*Chota Halkusa*	H.	C.
76	***Leucas cephalotes*** (Roth) Sperng.	Lamiaceae	*Gobbha*	*Tumba*	H.	Inf.
77	***Mangifera indica*** L.	Anacardiaceae	*Aam*	*Aam*	T.	Inf.
78	***Martynia annua*** L.	Martyniaceae	*Bichhu*	*Kalabichua*	S.	Inf.
79	***Melia azedarach*** L.	Meliaceae	*Bakain*	*Burg-e-Bakayen*	T.	C.
80	***Mentha arevensis*** L.	Lamiaceae	*Pudina*	*Nana* (*Pudina*)	H.	C.
81	***Mimusops elengi*** L.	Sapotaceae	*Maulsari*	*Mulsari*	T.	Inf.
82	***Momordica charantia*** L.	Cucurbitaceae	*Kerala*	*Karaela*	Cl.	C.
83	***Moringa oleifera*** Lamk.	Moringaceae	*Sahijan*	*Sahanjna*	T.	Inf.
84	***Morus alba*** L.	Moraceae	*Toot*	*Toot Shireen*	T.	C.
85	***Mucuna pruriens*** (L.) DC.	Fabaceae		Kaunch	Cl.	Inf.
86	***Nepeta hindostana*** (B. Heyne ex Roth) Haines	Lamiaceae		*Badranjboya* (*Billilotan*)	H.	R.
87	***Nyctanthes arbortristis*** L.	Oleaceae	*Harsingar*	*Harsingar*	S.	Inf.
88	***Nymphaea alba*** L.	Nymphaeaceae	*Kamal*	*Nilofar*	H.	Inf.
89	***Ocimum basilicum*** L.	Lamiaceae	*Kali Tulsi*	*Rehan; Tulsi; Faranjmushk*	H.	Inf.
90	***Ocimum tenuiflorum*** L.	Lamiaceae	*Tulsi*	*Tulsi Gangli*	H.	C.
91	***Pavonia zeylanica*** Cav.	Malvaceae		*Matupulug*	H.	C.
92	***Peganum harmala*** L.	Nitrariaceae	*Harmal*	*Ispand* (*Hurmal*)	H.	R.
93	***Pergularia daemia*** (Forsk.) Chiov.	Apocynaceae	*Aaksan*	*Mendhasingi*	Cl.	C.
94	***Phoenix sylvestris*** (L.) Roxb.	Arecaceae	*Khajur*	Khajur	T.	Inf.
95	***Phyla nodiflora*** (L.) Greene	Verbenaceae	*Jalbuti*	*Bukanbuti*	H.	C.
96	***Phyllanthus emblica*** L.	Phyllanthaceae	*Amala*	*Aamla*	T.	C.
97	***Phyllanthus fraternus*** G. L. Webster	Phyllanthaceae	*Bhuiamala*	*Bhui Aamla*	H.	C.
98	***Physalis minima*** L.	Solanaceae	*Papotan*	*Tankari*	H.	Inf.

99	***Pistia stratiotes*** L.[14]	Araceae		*Jalkumbhi*	H.	NR
100	***Plantago major*** L.	Plantaginaceae		*Bartang*	H.	R.
101	***Plumbago zeylanica*** L.	Plumbaginaceae	*Chitrak*	*Sheetraj Hindi*	S.	R.
102	***Pongamia pinnata*** (L.) Pierre	Fabaceae	*Papri*	*Karanj*	T.	C.
103	***Portulaca oleracea*** L.	Portulacaceae	*Kulfa*	*Khurfah*	H.	C.
104	Portulaca quadrifidia L.	Portulacaceae	*Chhotaluniya*	*Loniya*	H.	C.
105	***Prosopis cineraria*** (L.) Druce	Fabaceae	*Janti*	Ghaf	T.	Inf.
106	***Prosopis juliflora*** (Sw.) DC.	Fabaceae	*Kabuli Kikar*	Ghaff	T.	C.
107	***Rauvolfia serpentina*** (L.) Benth. ex Kurz	Apocynaceae	*Sarpagandha*	*Asrol*	S.	R.
108	***Ricinus communis*** L.	Euphorbiaceae	*Arandi*	*Arand; Bedanjeer*	S.	C.
109	***Saccharum bengalense*** Retz.	Poaceae	*Munj*	*Munja*	G.	C.
110	***Saccharum spontaneum*** L.	Poaceae	*Kans*	Kansa; Kasa	G.	Inf.
111	***Salvadora persica*** L.	Salvadoraceae	*Pilu*	*Pilu*	S.	Inf.
112	***Senna alata*** (L.) Roxb.	Fabaceae		*Dadmardan*	S.	Inf.
113	***Senna occidentalis*** (L.) Link.	Fabaceae	*Kasondhi*	*Kasondi*	S.	C.
114	***Senna tora*** L.	Fabaceae	*Chakwar*	*Panwar*	H.	Inf.
115	***Sesamum indicum*** L.	Pedaliaceae	*Til*	*Til Safad; Til Siah*	H.	C.
116	***Sida alnifolia*** var. ***obovata*** (Wall. ex Mast.) Fl.	Malvaceae		*Bariyala*	H.	C.
117	***Sida cordifolia*** L.	Malvaceae	*Bijband*	*Khareti*	H.	Inf.
118	***Sisymbrium irio*** L.	Brassicaceae	*Khubkalan*	*Khaksi*	H.	C.
119	***Solanum americanum*** Mill.	Solanaceae	*Makoya*	*Makoh*	H.	C.
120	***Solanum anguivi*** Lamk.	Solanaceae	*Bhatakateri*	*Badi Kateli*	S.	Inf.
121	***Solanum virginianum*** L.	Solanaceae	*BerKateli*	*Khatai Khurd*	S.	C.
122	***Sonchus arvensis*** L.	Asteraceae	*Gubbi*	*Bhangra*	H.	Inf.
123	***Streblus asper*** Lour.	Moraceae	*Choriya*	*Bernikka Sehwri*	T.	R.
124	***Syzygium cumini*** (L.) Skeels	Myrtaceae	*Jamun*	*Jamun*	T.	C.
125	***Tamarindus indica*** L.	Fabaceae	*Imali*	*Tukhm-e-Imli*	T.	C.
126	***Tephrosia purpurea*** (L.) Pers.	Fabaceae	*Sarphonka*	*Sarphuka*	H.	C.
127	***Terminalia arjuna*** (Roxb. ex DC.) Wight & Arn	Combretaceae	*Arjuna*	*Arjun*	T.	C.
128	***Terminalia bellirica*** (Gaertn.) Roxb.	Combretaceae	*Bahera*	*Bahera*	T.	Inf.
129	***Tinospora sinensis*** (Lour.) Merr.	Menispermaceae	*Giloya*	*Gilo*	Cl.	C.
130	***Tribulus terrestris*** L.	Zygophyllaceae	*Gokhru*	*Khar-e-Khasak*	H.	C.
131	***Withania somnifera*** (L.) Dunal	Solanaceae	*Ashwagandha*	*Asgand*	S.	Inf.
132	***Wrightia tinctoria*** R. Br.	Apocynaceae		*Inderjo Sheerin*	T.	Inf.
133	***Xanthium strumarium*** L.	Asteraceae	*Bichhu*	Kutta Jhad	H.	C.
134	***Ziziphus jujuba*** Mill.	Rhamnaceae	*Ber*	*Ber*	T.	C.
135	***Ziziphus nummularia*** (Burm. f.) Wight & Arn.	Rhamnaceae	*Jharberi*	*Jharberi*	S.	C.

Abbreviations Used: Habit: H. (Herb); S. (Shrub); T. (Tree); G. (Grass); Se (Sedge) P. (Parasite); Cl. (Climber);

Abbreviations Used: Status: C. (Common); I. (Infrequent); R. (Rare); NR. (New records)

Among these, 125 (92.59%) species under 45 (90.0%) families and 106 genera (92.17%) belong to dicotyledones, whereas 10 (7.4%) species under 9 (7.82 %) genera and 5 families (10.0%) belong to monocotyledons (Fig. 1). The ratio of monocotyledons to dicotyledons is 1:9.0 for families, 1:11.7 for genera and 1: 12.5 for species. Out of 135 species recorded in the study area, Herb (56), Tree. (39), Shrub (26), climber (7), Grass (5), Sedge and Parasite (1), each respectively (Fig. 2).

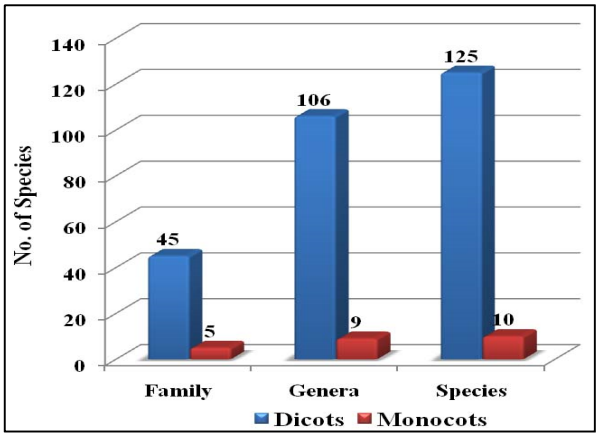

Fig 1: Floristic diversity of Unani medicinal plants in Delhi region.

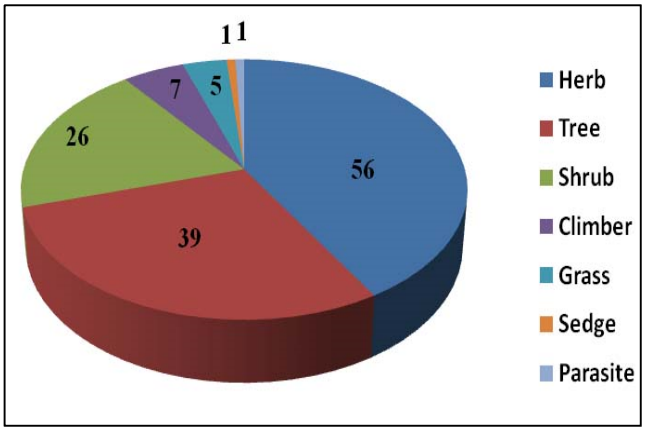

Fig 2: Distribution of vegetation of Delhi used in Unani system of Medicine.

The most commonly represented families were Fabaceae (23 sp), Apocynaceae (7 sp), Asteraceae, Malvaceae, Lamiaceae and Solanceae (6 sp) each respectively (Fig. 3). Similarly, 70 (51.85%) are common; 52 (38.51 %) infrequent, 11 (8.14%) rare, and 2 (1.48 %) as new records (Fig. 4).

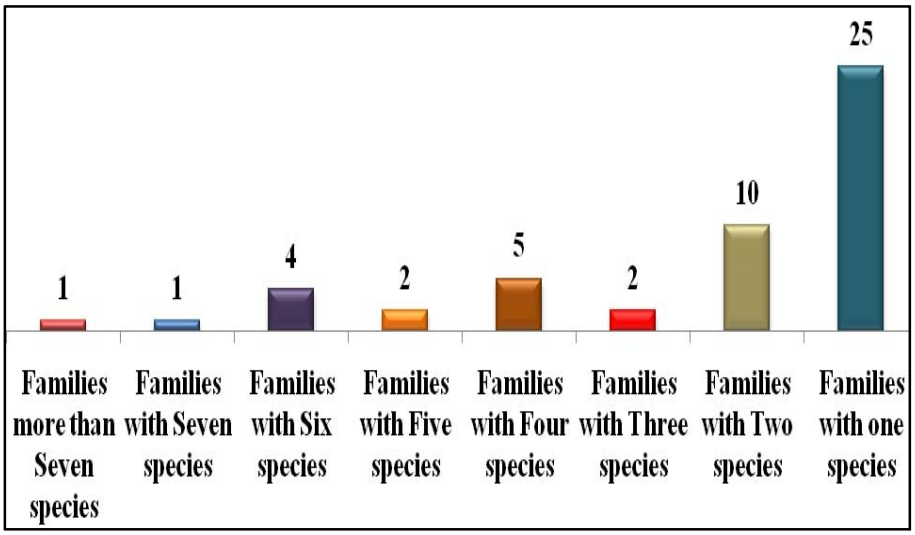

Fig 3: Dominant families of Unani medicinal Plants in Delhi Flora

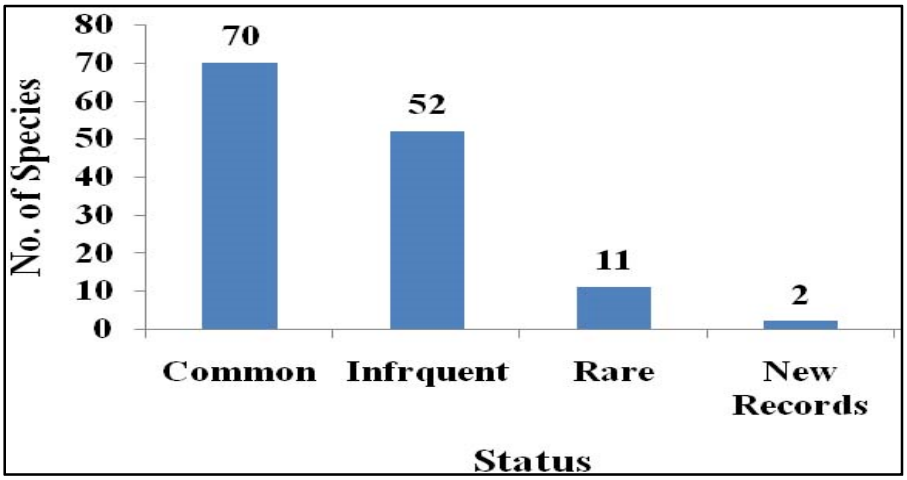

Fig 4: Status wise classification of Unani plants species of Delhi Flora.

Table 2: Alien diversity of Unani medicinal plants in Delhi flora.

S.No.	Plant name	Family	Habit	Nativity
1	***Amaranthus spinosus*** L.	Amaranthaceae	H.	Tropical America
2	***Argemone mexicana*** L.	Papaveraceae	H.	Tropical Central & South America
3	***Asphodelus tenuifolius*** Cav.	Xanthorrhoeaceae	H.	Tropical America
4	***Blumea lacera*** (Burm.f.) DC.	Asteraceae	H.	Tropical America
5	***Calotropis procera*** (Aiton) W. T. Aiton	Apocynaceae	S.	Tropical Africa
6	***Cannabis sativa*** L.	Cannabinaceae	H.	Central Africa
7	***Chamaecrista absus*** (L.) H.S. Irwin & Barneby[14]	Fabaceae	H.	Tropical America
8	***Chenopodium album*** L.	Amaranthaceae	H.	Europe
9	***Cleome gynandra*** L.	Cleomaceae	H.	Tropical America
10	***Cleome viscosa*** L.	Cleomaceae	H.	Tropical America
11	***Cuscuta reflexa*** Roxb.	Convolvulaceae	P.	Mediterranean
12	Datura metel L.	Solanaceae	H.	Tropical America
13	***Echinochloa crus-galli*** (L.) P. Beauv.	Poaceae	G.	Tropical South America
14	***Eclipta prostrata*** (L.) L.	Asteraceae	H.	Tropical South America
15	***Euphorbia hirta*** L.	Euphorbiaceae	H.	Tropical America
16	***Martynia annua*** L.	Martyniaceae	S.	Tropical America
17	***Physalis minima*** L.	Solanaceae	H.	Tropical America
18	***Pistia stratiotes*** L. [14]	Araceae	H.	Tropical America
19	***Portulaca oleracea*** Linn.	Portulacaceae	H.	Tropical South America
20	***Portulaca quadrifidia*** L.	Portulacaceae	H.	Tropical America

21	***Prosopis juliflora*** (Sw.) DC.	Fabaceae	T.	Mexico
22	***Saccharum spontaneum*** L.	Poaceae	G.	Tropical West Asia
23	***Senna alata*** (L.) Roxb.	Fabaceae	S.	West indies
24	***Senna occidentalis*** (L.) Link.	Fabaceae	S.	Tropical South America
25	***Senna tora*** L.	Fabaceae	H.	Tropical South America
26	***Solanum americanum*** Mill.	Solanaceae	H.	Tropical America
27	***Tribulus terrestris*** L.	Zygophyllaceae	H.	Tropical America
28	***Xanthium strumarium*** L.	Asteraceae	H.	Tropical America

Abbreviations Used: Habit: H. (Herb); S. (Shrub); T. (Tree); G. (Grass); P. (Parasite).

102 alien species have been reported from flora of Delhi[15], during the study of this work, we have reported 28 taxa are as invasive nature in Delhi province which used in Unani system of medicine (Table 2). Of these, 13 families, 20 genera and 24 species belong to dictoylendons and 3 families, 4 genera and 4species belong to monocotyledons. Herbs contributed maximum with 20 species (71.42%) followed by shrubs 4 species (14.28%), grasses with 2species (7.14%), tree and parasites 1 species (3.57%) each, respectively. Family Fabaceae is dominated in these alien plants with (5species) followed by Asteraceae (3 species) and Amaranthaceae, Cleomaceae, Convolvulaceae, Poaceae, Portulacaceae, Solanaceae (2 species each), respectively. Among these alien species, 23 species (82.14%) are native to America continental, 2 species (7.14%) Africa, 1 species (3.57%) Asia, Europe and Mediterranean region each, respectively (Fig. 5).

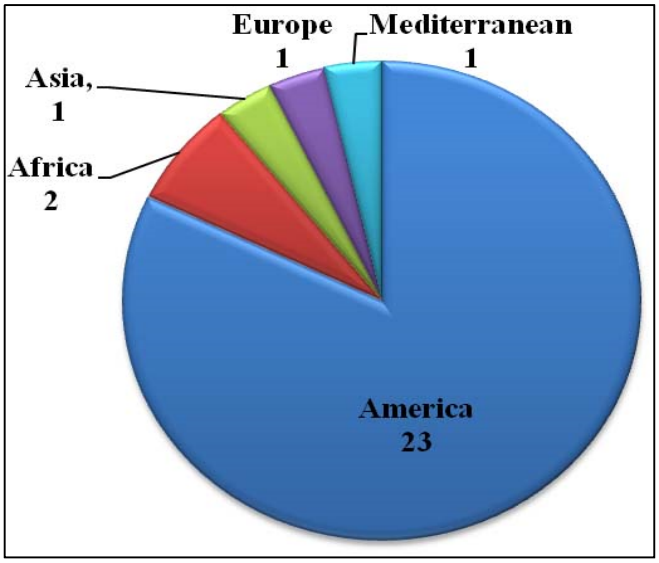

Fig 5: Nativity of invasive plants species of Delhi used in Unani system of Medicine

Plants species occupied in present survey, which are used in various diseases such as Asthma, Cough, Fever, Dysentery, Headache, Skin diseases, Piles, Ulcer, Jaundice, Diabetes, Stomachache, Swelling of trout, Leprosy, Anemia, Purgative, Gonorrhea, Chest diseases, Malaria, Wounds, Rheumatism, Bronchitis, Digestive disorder, Cardiac diseases, Ophthalmia and Diarrhea. About 70% of modern medicines in India are derived from wild sources[20] and utilization of Unani medicines are increasing in developing and as well as developed countries. Natural floral diversity of Delhi is under various threats due to over exploitation, urbanization, habitat destruction, increased demand of crude drug materials in pharmaceutical industries and climate changes, so there is urgent need to conserved the wild floral diversity of Delhi, so many medicinally important plants are present in Ridges, Yamuna flood plains, agricultural fields, railway tracks, because large proportions of the poor people population depend on herbal medicine for their health care. The species whose population has receded to a great extent need special attention and efforts should be made to conserve them by forest department of Delhi in proposed protected areas. Administration of Delhi declared many reserved forest area in Delhi. Proper care should be taken for their conservation by ex-situ, in-situ conservation and multiplication of rare, endangered medicinal plants through modern techniques. It is also important to develop many Biodiversity Park and declaration of reserve forests of Delhi ridge and Yamuna River banks which will help in the conservation of many valuable species.

4. Conclusion

During the course of study, 135 plant species belonging to 50 families have been documented. Out of 50 families of angiosperms 45 (125 species) were Dicotyledons and 5 (10 species) Monocotyledons. Plant diversity is one of the major resources that fulfill the needs of human beings. The floral diversity is under various threats due to over exploitation and increased demand of herbal raw material in pharmaceutical industrialization, habitat destruction and climate changes.

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