RESEARCH ARTICLE

GROWTH OF MEDICINAL PLANT RESOURCES AS PER THE GEOGRAPHICAL CONDITIONS OF MEERUT DISTRICT, UTTAR PRADESH

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Abstract: Usefulness of medicinal plants is well documented since the time immemorial. These plants are found and distributed in throughout India and abroad. Although, their density as well as diversity may variable from region to region and habitats to habitats depending upon their geographical conditions which include soil, rain, temperature, topography etc. The body parts of these medicinal plants are used for curing different types of serious diseases such as tuberculosis, leprosy, asthma, piles, dengue fever, typhoid fever, blood bleeding etc. in human beings , domestic animals and other wild animals. Keeping this in view an extensive survey work was carried out during Jan 2019 – March 2019, in District Meerut of Uttar Pradesh state of India, for the medicinal plant resources in district Meerut Uttar Pradesh .Present paper advocated to local peoples (especially of rural areas), for protection of these plants and secure their life for better survival.

Keywords: Growth, Medicinal plants, Medicines, Meerut district

INTRODUCTION

Our ancient ancestors lived and spent their life, in the forests, cages, crevices of mountains, shelter of plants, and open areas in the nature. But they had very much knowledge of valuable medicinal plants and secured their life from various types of serious diseases. They believed that some plants (especially medicinal plants) had divine qualities. Ayurveda and traditional Chinese medicines are well known to the world for their natural ingredients and multiple benefits (Sachan et al., 2015). In view of the innate Indian strengths, which include diverse ecosystems for growth of medicinal plants, farming capacity, strong manufacturing sector, the medicinal plants sector can provide a huge export opportunity after fulfilling domestic needs (Kumar et al., 2003). Nature has bestowed our country with an enormous wealth of *soil, rain, temperature, topography along with* medicinal plants, therefore, India has often been referred to as the "medicinal garden of the world" (Katewa and Sharma, 2001).Medicinal plants are being looked upon not only as a soruce of health care but also as a source of income (Sachan et al.,2015).In the present studies, an attempt was made to find out medicinal plants of western Uttar Pradesh , India for their utility for curing different types of human and domesticated animal diseases.

MATERIALS AND METHODS

In the present studies, district Meerut of Uttar Pradesh, was divided in three regions i.e. Sardhana, Mawana and Meerut regions, were selected for the study of medicinal plants of this region in different habitats such as forest land, agricultural land, crop lands, orchard lands, near the road side, near the houses or buildings, anywhere, the medicinal plants were located and identified keeping in mind all the geographical conditions such as soil type, availability of water, sources of water, temperature conditions, topography. The present study is based on the extensive survey work during Jan 2019- March 2019. Identification of the collected (non-identified plant species) small medicinal plants was done at the laboratory by observing their morphological characters with experts, and if any large plant is not identified during the time of survey, then a clear photograph was taken and consulted with the experts and identified. During the survey work, local as well as regional names of the medicinal plants were also recorded side-by-side, discussing with the local peoples, especially belonging to rural area.

1. District Geographical Profile

Location : 70 km away from Delhi on Delhi – Dehradun National highway No. 58
Latitude 28º 59' 24″N,77° 42′ 0″ ELatitude 28.99, 77.7 , Elevation: 224.659 m
Area : 2590 sq km
Major River : Ganga
Rain Fall : 800 – 1000 mm/year
Temperature: Summer:Max.–43-45ºC,Min.–19-21ºC
Winter : Max. – 20 - 23 ºC, Min. – 03 - 05 ºC
Villages : 667
Tehsil : 03 (Sardhana, Meerut, Mawana)
Blocks : 12 (Sardhna, Jani, Rohta, Saroorpur, Rajpura, Daurala, Kharkhoda, Meerut, Hastinapur, Parikshitgarh, Macchra, Mawanakalan)
Population : 3447405
Population : 1347/sq km
Population Growth Rate During 2001 - 2011 : 15.92%
Female: 885
Male : 1000
Literacy Percent : 74.80% (Male: 82.91% & Female: 65.69%)

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Major Industry : Sugar, Distillery, Tyre, Textile, Transformer, Paper & Sports
Per Capita Income : Rs. 36385/year
Net Cultivable Area : 198941 ha
Irrigation Percent : 99.6%
Cropping Intensity : 152.76%,
Percent : 72%
Major Crops : Sugarcane, Wheat, Rice, Arhar & Mustard
Productivity(q/ha): Sugarcane-708
Wheat-42.27
Mustard-12.60
Paddy-28.74
Arhar - 12.00
Fruit : Mango and Guava
Vegetables : Cabbage, Potato, Cucumber, Perwal, Okra, Brinjal
Flowers : Marigold, Gladiolus, Tuberose
Major Diseases & Pest: Crops - Disease : Blast and blight in paddy, Mosaic in vegetables
Insect Pest : White grub and Top borer in sugarcane, Stem borer in rice, Fruit borer in Tomato, Brinjal& Okra
Animals - Disease : Repeat breeding in cattle & buffaloes, Foot & mouth disease, Mastitis, Hemorrhagic septicemia
Insect Pest : Liver fluke, Hookworm, Ticks & lice
Soil Fertility Status : Nitrogen (Low to Medium), Phosphorous(Low to Medium), Potash (Medium)
Any Problem Soils : Nil
Horticulture : Fruits, Vegetables, Flowers
Major Animals & Their Population :
Buffaloe:871681 Cattles : 216931

Table 1. Description of Agro-climatic Zone & Major Agro Ecological Situations

S. N.	Agro - Climatic Zone	Characteristics
1	Western Plain Zone	1. The zone includes districts of Muzaffarnagar, Meerut, Baghapat, Ghaziabad, GautamBudh Nagar, Panchsheel Nagar, Bulandshahr and parts of Saharanpur located between the Ganga and Yamuna River and their tributaries. 2. The zone is highly productive with light coloured loam soil. The average annual rainfall is 795 mm. 3. Relative humidity range from 32 to 85% and the temperature ranges from 2.50 C to 430C. Rice wheat sugarcane based cropping system is prevalent in the zone.

Table 2.

Situation	Soil Type	PH	Farming System	Major Crops	Live Stock	Block
AES I	Loam	7.5 - 8.5	Sugarcane-Ratoon-Wheat, Agro forestry and/or Jower-wheat (2-3 Graded buffalo/1 Cross bread cow)	Sugarcane, Wheat, Paddy, Potato, Vegetable, Jower	Buffalo, Cow, Poultry, Sheep & Goat	Mawana, Jani,Pariksheetgarh, Machhra, Kharkoda, Rajpura, Meerut, Duaralla, Sardhana, Saroorpur, Rohta
AES II	Loam Sand	7.0 - 8.0	Sorghum-Potato-Cucurbits and/or Sugarcane-Ratoon-Wheat (2-3 Graded buffalo / 1 Cross bred cow)	Sugarcane, Potato, Wheat, Mango, Bajra, Jower	Buffalo, Cow, Poultry, Sheep & Goat	Hastinapur, Pariksheetgarh, Machhra, Kharkhoda, Jani, Rohta, Saroorpur, Sardhana
AES III	Sandy loam, Silty loam, Clay laom	7.5 - 7.9	Paddy-wheat and/or Jower-Wheat-Sugarcane –Ratoon-Wheat (2-3 Graded buffalo/ 1 Cross bred cow)	Sugarcane, Paddy, Wheat, Jower, Vegetable	Buffalo, Cow, Poultry, Sheep & Goat	Hastinapur, Pariksheetgarh

Table 3.

S.N.	Soil Type	Characteristics	Area in ha
1	Sandy loam to loam with normal PH	The soils have enough clay to store adequate amounts of water and plant nutrients for optimum plant growth. They contain enough silt to hold sufficient available water for plants, to gradually from more clay and to release fresh plant nutrients by weathering. Clay content is not much as to cause poor aeration or to make working with them difficult. A soil containing between 7 to 27% clay and approximately equal amount of silt and sand has a loam texture. Organic content in the soil is 0.3 to 0.4%.	Total – 259000 a) Cultivated Land - 2,00,000 b) Forest Area - 21314 c) Horticulture - 2266 d) Other – 35420

RESULTS AND DISCUSSION

During the survey work, a total 25 Family medicinal plant species were identified and recorded in the district Meerut of Uttar Pradesh, in which details of around 32 sub species are been given in detail with their value and distribution and the total of 67 medicinal plant resources are clearly depicted in Table-1. which describes botanical names, english names, regional names, plant parts used and families of all identified medicinal plants of this region.

From these plants, some of the plant species were identified, more useful for the treatment of several kinds of dangerous human diseases. Treatment of haemorrhage and asthma, plie problem & asthma, haemorrhage & asthma, gonorrhoea, pile problem & asthma, turberculosis, bleeding piles, asthma, ulcers & asthma ,hydrocoel, kidney and gall stones, asthma, asthma & fever, gall stone problems, antipoison to scorpion, wasps & honey bees bites, asthma & paralysis, asthma, gall bladder stone, syphilis & leprosy, intestinal haemorrhage, asthma, leucorrhoea, leucorrhoea & spermatorrhoea, arsenal poisoning, gonorrhoea, anti-cancer, anti-viral (pox virus), & anti-bacterial & blood vomiting, by using different plant parts (leaves, fruits,barks, roots etc.) of *Solanum melongena, Datura innoxia, Solanum jasminoides, Solanum nigrum, Celosia argentia, Achyranthes aspera, Parthenium hysterophorus, Helianthus annus, Ricinus comminis, Phyllanthus fraternus, Euphorbia hirta, Euphorbia nerrfolia, Mentha spicata, Menth piperata, Leucas aspera, Ficus religiosa, Saccharum officinarum, Centella asiatica, Colocasia esculenta, Caloropis gigantea, Punica grantum, Mucuna pruriens, Ipomoea aquatic, Euzuisetum arvense, Carica papaya, Azardicachta indica and Nelumbo nucifera*, respectively, cured, serious and dangerous diseases in human beings and several domesticated animals. Although, rest species of medicinal plants are also useful for the treatment of different types of common diseases in human beings also. The various parts of the plants have been used as a source of medicines by man from ancient to modern era (Bisht and Badoni, 2009;Mehra *et al.*, 2014; Kumaran and Citarasu, 2015;Turye et al.,2015;Bajpai et al.,2016). Plant species belonging to different genera and families were used by most of the local peoples for the treatment of common diseases (Maliya, 2004; Singh et al.,2002;Mohd,2012;Nigam et al., 2013 and Verma et al.,2007). Plant species were also used to prevent eye, gastric, respiratory problems, fever, antidote for snake and scorpion bites, sunstroke, arthritis, hydrocoel, toothache, cough, dysentery and jaundice (Sachan et al.,2015). Pandey and Pandey (2016) have described and reported nine sacred plants and their medicinal utility for currig various types of diseases like-rheumatism fever, cough, cold, anaemia, diarrhoea, blood vomiting, uterine disorders, ulcers, leprosy, dysentery, bronchitis, asthma, leukoderma, etc. in human beings. The medicinal importance of the plants is also mentioned by Kumar et al.(2012, 2013).Government of India aims to make the cultivation of medicinal plants and its sustainable management ,a people movement (Kumar et al.,2005).

I.Family:Solanaceae 1. *Lycopersicum esculentum var.cerasiforme* Medicinal value: Fruits are used to soothe skin irritation, gastric and colic problems, stimulate liver and kidney and as antiseptic. Fruits are also used as vegetable. Distribution: Meerut, other parts of the state. 2.*Datura innoxia* Mill (Prickly burr) Medicinal value: Pile problems, eye diseases, pain in joints or muscles and treatment of asthma. Distribution: Mathura, Moradabad, Meerut, Bijnor, Muzaffernagar, Saharanpur, Jyotiba Phule nagar and other parts of the state.

II.Family:Amaranthaceae 3.*Celosia argentia* L. (Wool flower, cock's comb) Medicinal value: Treatment of dysentery, diarrhea, ulcers, skin eruption and tuberculosis etc. Distribution: Meerut, Bijnor, and other parts of the state. 4.*Amaranthus sp.* (Amaranth) Medicinal value: Stem and leaves arecookedandeaten as vegetable. Leaves are used as a tonic Distribution: Meerut, Bijnor, Rampur, Jyotiba Phule Nagar, Bagpat, Muzaffernagar, Saharanpur, and other parts of the state.

III.Family: Asteraceae 5.*Helianthus annus* L. (Sun flower) Medicinal value: Heals wounds, ulcers, pulmonary disorders, bronchitis, asthma, dysentery, wooping cough and colds.

Distribution: Meerut, Bijnor, Bagpat, Muzaffernagar, Saharanpur, and other parts of the state. 6.*Ageratum conyzoides* L.(Conyzoid floss flower,billy goat weed) Medicinal value: Leaves juice is applied to cut, wounds, and also used as an insect repellent. Distribution: Meerut, Bijnor, Bagpat, Muzaffernagar, Saharanpur, and other parts of the state.

IV.Family:Euphorbiaceae 7.*Phyllanthus fraternus* G.L.Webster (Phyllanthus) Medicinal value: Treatment of kidney stone and gall stone, cystitis, uro-genital disorders ,jaundice, dysentery, gonorrhoea and diabetes etc. Distribution:Meerut, Bijnor,and other parts of the state. 8.*Euphorbia hirta* L. (Asthma weed) Medicinal value: Treatment of asthma, cough & cold, bronchitis, and expels intestinal worms. Distribution: Meerut, Bijnor and other parts of the state.

V.Family:Cucurbitaceae 9.*Momordia charantia* discourt (Bitter gourd) Medicinal value: It is used in treating diabetes, pain in joints or muscles, dysentery, and for de-worming (prevents infestation of worms), leaves with *Allium cepa* (pyaj) for cattle's fever. Distribution:Meerut, Bagpat, Muzaffernagar, Saharanpur, and other parts of the state.

VI.Family: Malvaceae 10.*Hibiscus rosa-sinensis* L. (Rose) Medicinal value: Flower and stem extracts relievers periodic pain, spasms, cures sexually transmitted diseases, cough and cold, soothes internal

and external wounds and sores. Flowers are also used to lower body heat. Distribution: Meerut, Bijnor, Bagpat, Muzaffernagar, Saharanpur, and other parts of the state.

VII.Family: Lamiaceae 11.*Mentha spicata* L.(Garden mint, Spearmint) Medicinal value: Leaves are used as a stimulant and tonic, jaundice, inflammation of prostate, gall stone problem, vomiting, throat and uterus infectons, toothache and for de-worming .The oil is used for flavoring food beverages. Distribution:Meerut

VIII.Family:Moraceae 12.*Ficus religiosa* L. Medicinal value: Leaf extract is used as ear drop, paste of bark is used in inflammation and glandular swelling of neck. Fruits are used to promote bowl movement and against asthma. Distribution: Meerut, Bijnor, Bagpat, Muzaffernagar, Saharanpur, and other parts of the state. 13.*Artocarpus heterophyllus* Lam. (Jackfruit) Medicinal value: Bark is used for the treatment of burns on skin, roots are used in the treatment of skin diseases and asthma.Seeds relives biliousness. Distribution: Meerut, Bijnor and other parts of the state.

IX.Family: Compositae 14.*Tagetes erecta* L. (Marry gold) Medicinal value: Pain in joints or muscles, cold, bronchitis, boils, carbuncles, eye diseases, ulcers, and pyorrhea. Distribution: Meerut, Bijnor, Saharanpur, and other parts of the state.

X.Family:Poaceae 15.*Zea mays* (maize) Medicinal value: Diuretic, heart diseases, liver diseases, and hypertension Distribution: Meerut, Bijnor, Saharanpur, and other parts of the state. 16.*Saccharum officinarum* L.(Sugar cane) Medicinal value: Jaundice, gall bladder stone, arthritis, skin ulcers caused by pressure or friction, boils and sore eyes. Distribution: Meerut, Bijnor, Bagpat, Muzaffernagar, Saharanpur, and other parts of the state. Although, Very abundant in Pilibhit, Shahjahanpur, Budaun & Bareilly districts.

XI.Family: Annonaceae 17.*Annona squamosa* L. (Sugar apple) Medicinal value: Leaves are used in treatment of ulcers and dysentery.The green fruit is used against diarrhea.Barks are used against dysentery. Distribution: Meerut, Bijnor, Saharanpur, and other parts of the state.

XII.Family: Araceae 18.*Alocasia macrorrhiza* L. (Giant taro) Medicinal value: Treatment of fresh cuts and urinary problems.It is also used for deworming and corns are used as vegetable also. Distribution:Meerut and other parts of the state. 19.*Colocasia esculenta* L. (Cocoyam, taro) Medicinal value:Insect stings, cuts, burns, injuries, and intestinal haemorrhages Distribution: Meerut, Bijnor, Bagpat, Muzaffernagar, Saharanpur, and other parts of the state.

XIII.Family:Citraceae 20.*Citrus sp.* Medicinal value: Good against cold & cough, throuat infection and indigestion , piles problems. Distribution: Meerut, Bijnor, Muzaffernagar, Saharanpur, and other parts of the state.

XIV.Family: Chenopodiaceae 21.*Chenopodium album* L. (Wild spinach) Medicinal value: Expels gas from the intestines, promotes bowl movements, expelsintestinal parasites, increases flow of urine , and use as a tonic. Distribution: Bijnor,Meeut and other parts of the state.

XV.Family: Oxalidaceae 22.*Oxalic corniculata* L. (Clover sorrel) Medicinal value: The herb is used as a cure for scurvey, cataract , boil, wounds, eczema, dysentery, diarrhea, and used as an appetizer. Distribution: Meerut, Bijnor, Bagpat, Muzaffernagar, Saharanpur,and other parts of the state.

XVI.Family: Musaceae 23.*Musa paradisica* (Banana) Medicinal value: Dysentery, cardiac diseases, hypertension and diabetes. Distribution: Meerut, Bijnor, Bagpat, Muzaffernagar, Saharanpur, and near the houses, buildings, ponds, agricultural crops, rivers, lakes etc., of other parts of the state.

XVII.Family:Ppilionaceae 24.*Mucuna pruriens* L. (Cow hage) Medicinal value: Root decoction induces the flow of urine and act as body tonic. The hairs on the pod are used against thread worm.It is also used in treating reproductive disorders like-leucorrhoea, spermatorrhoea, and menstrual problems. Distribution: Meerut, Bijnor, Saharanpur, and other parts of the state.

XVIII.Family:Fabaceae 25.*Mimosa pudica* L. Medicinal value: It is used in treating pile problems, diarrhea and skin diseases. Distribution: Meerut, Bijnor, Bagpat, Muzaffernagar, Saharanpur, and other parts of the state.

XIX.Family:Arecaceae 26.*Livistona jenkinsiana* Griff (Major jen kins palm) Medicinal value: Fruits are used in treating stomach ailments. Seeds are used as bottons. Distribution: Meerut, Bijnor, Bagpat, Muzaffernagar, Saharanpur, and other parts of the state.

XX.Family:Mimosaceae 27.*Leucaena leucocephala* Lam.(Jumpy bean) Medicinal value: Against ascaris parasites in human beings and cattles also.
Distribution: Meerut, Bijnor, Bagpat, Muzaffernagar, Saharanpur, and other parts of the state.

XXI.Family:Equisetaceae 28.*Equisetum arvense* L. (Horse tail) Medicinal value: Treatment of gonorrhoea, coughing, rheumatism (pain in joints or muscles), and arthritic problems. Distribution: Meerut, Bijnor, Bagpat, Muzaffernagar, Saharanpur.Found in more abundance near to large rivers and small rivers (nahars) side even in agricultural fields of Bisalpur tehsil of Pilibhit district ,and other parts of the state.

XXII.Family:Cyperaceae 29.*Cyperus rotundus* L.(Nut grass) Medicinal value: Increases flow of urine , expels intestinal parasites, produce contraction on the tissues or canals of the body, thereby reduce the flow of secretions and discharges of blood , mucus, diarrhea and stimulant etc. Distribution: Meerut, Bijnor, Bagpat, Muzaffernagar, Saharanpur, and other parts of the state.

XXIII.Family: Caricaceae 30.*Carica papaya* L. (Papaya) Medicinal value: Leaves are used for removing corns and warts. Papaya leaves also used in treatment of dengue fever with goat milk.Fruits helps in digestion, flow of urine and constipation (difficulty in eliminating solid waste or faeces); and seeds act as anti-cancer. Distribution: Meerut, Bijnor, Bagpat, Muzaffernagar, Saharanpur, and other parts of the state.

XXIV.Family:Meliaceae 31.*Azadirachta indica* A.Juss. (Neem) Medicinal value: Bark is used for treatment of several skin diseases. Leaves and fruits used for the treatment of fevers, joint pains, lungs diseases, intestinal diseases ,expels intestinal parasites, anti-bacterial ,anti-viral, smoll pox, anti-poisonous,wounds and cuts etc. Distribution: Meerut, Bijnor, Bagpat, Muzaffernagar, Saharanpur. Abundantly seems in all the villages and all the tehsils and districts of western parts of the state, and other parts of the India.

XXV.Family:Rutaceae 32.*Aegle marmelos* L. Medicinal value: Treatment of various digestive disorders such as acidity, vomiting, diarrhea, dysentery, etc. have been cure be ripe fruits. Distribution: Meerut, Bijnor, Bagpat, Muzaffernagar, Saharanpur, and other parts of the state.

Table 4. Showing Medicinal Plant Resources of District Meerut, Uttar Pradesh

S. No	Botanical names	English name	Regional name	Plant parts used	Families
1.	*Solanum melongena* L.	Brinjal	Egg plant , Baigan	Leaves Fruits & Bark	Solanaceae
2.	*Physalis peruviana* L.	Golden Cape, goose berry	Badi Khish mukaiya	Fruits & Bark	-do-
3.	*Physalis minima* L.	Little goose berry	Choti khish mukaiya	Fruits & Bark	-do-
4.	*Lycopersicum esculentum var.cerasiforme*	-	-	Mostly fruits	-do-
5.	*Datura innoxia* Mill.	Prickly burr.	Dhatura	Seeds & Leaves	-do-
6.	*Capsicum annum* L..	Chilli	Hari lal mirch	Mostly Fruits	-do-
7.	*Solanum jasminoides* Paxt.	Potato vine	-	Leaves & Barks	-do-
8.	*Solanum nigrum* L.	Black nigh shade	Kali mukaiya	Whole plant	-do-
9.	*Celosia argentia* L.	Wool flower	Cock's comb	Whole plant	Amaranthaceae
10.	*Amaranthus spinosus* L.	Prickly amaranth	Kante wali kateli	Whole plant	-do-
11.	*Amaranthus sp.*	Amaranth	Chauraiya	Whole plant	-do-
12.	*Amaranthus gangeticus* L.	Elephant-headed amaranth	Lal patte wali chauraiya	Whole plant	-do-
13.	*Achyranthes aspera* L.	Devil's horse whip	-	Whole plant	-do-
14.	*Parthenium hysterophorus* L.	Camomille balais	Congress grass	Whole plant	Asteraceae
15.	*Helianthus annus* L.	Sun flower	Surajmukhi	Seeds	-do-
16.	*Ageratum conyzoides* L.	Conyzoid floss flower	Billy goat weed & Mahakua grass	Whole plant	-do-
17.	*Acmella oleracea* L.	Toothache plant	Ghundi wala mahakua	Leaves, Fruits & Roots	-do-
18.	*Eclipta alba* L.	False daisy	Bhangarro	Whole plant	-do-
19.	*Ricinus communis* L.	Caster bean	Arand & Andaua	Leaves, Roots, seed oil & Barks	Euphorbiaceae
20.	*Phyllanthus fraternus*	Phyllanthus	-	Leaves and fruits	-do-
21.	*Euphorbia hirta* L.	Asthma weed	Jungali dudhi	Leaves, Fruits & Roots	-do-
22.	*Euphorbia nerrifolia* L.	Common milk hedge	General dudhi	Roots & latex	-do-
23.	*Momordia charantia* L.	Bitter gourd	Lamba karela	Leaves, Fruits & Roots	Cucurbitaceae
24.	*Momordica balsamina* L.	Balsam apple	Chota karela	Leaves, Fruits & Seeds	-do-
25.	*Luffa cylindrical* L.	Sponge gourd	-	Fruits & Seeds	-do-
26.	*Urena lobata* L.	-	Bhadya	Root & Leaves	Malvaceae
27.	*Hibiscus rosa-sinensis* L.	Rose	Gulab	Leaves, Stem & Fruits	-do-
28.	*Mentha spicata* L.	Garden mint, Spearmint	Wild shivali	Mostly leaves	Lamiaceae
29.	*Mentha piperata* L.	Pipermint	Shivali	Leaves & leaves oil	-do-
30.	*Leucas aspera* Willd.	Common leucas	-	Whole plant	-do-
31.	*Ficus indica* L.	Indian fig, Banyan tree	Bargad	Fruits	Moraceae
32.	*Ficus religiosa* L.	-	Peepal tree	Leaves, Bark & Fruits	-do-
33.	*Altocarpus heterophyllus* Lam.	Tack fruit	Kathal	Bark, Root & Seeds	-do-
34.	*Rumex crispus* L.	Curly dock	Wild & small talpalaki	Leaves & Roots	Poligonaceae
35.	*Rumex acetosa* L.	Sorrel	Wild & large talpalaki	Leaves & Roots	-do-
36.	*Tagetes erecta* L.	Marry gold	Genda	Whole plant	Compositae
37.	*Zea mays*	Maize, Glutionous corn	Makka	Corn, silk & Corn meal	Poaceae
38.	*Saccharum officinarum* L.	Sugarcane	Ganna	Culms	-do-
39.	*Cannabis sativa* L.	Marijuna, hemp	Bhang	Leaves & Fruits	Cannabaea
40.	*Sesuvium portulacastrum* L.	Shoreline purselane	Wild gaddavi	Whole plant	Aizoaceae

41.	*Agave Americana* L.	Century plant	-	Whole plant	Agaraceae
42.	*Centella asiatica* L.	Indian penny wort	Brahmi	Whole plant	Umbeliferae
43.	*Annona squamosa* L.	Sugar apple	Sharipha	Leaves, Fruits & Barks	Annonaceae
44.	*Alocasia macrorrhiza* L.	Giant taro	Banghuiya		Araceae
45.	*Colocasia esculenta* L.	Cocoyam, taro	Elephant ear , general ghuiya	Leaves & Corn	-do-
46.	*Caloropis gigantean* L.	Madar, Crown flower	Akaua	Whole plant	Asclepiadaceae
47.	*Argemone Mexicana* L.	Mexican poppy	Kataiya	Leaves, Seeds & Roots	Papeveraceae
48.	*Anthocephlus chinensis* L.	Kadam	Kadamb	Leaves, Fruits & Barks	Rubiaceae
49.	*Clerodenrum viscosum* Vent.	Hill glory bower	Bhatt plant	Mostly Leaves	Verbenaceae
50.	*Punica grantum* L.	-	Anar	Leaves & Fruits	Punicaceae
51.	*Citrus sp.*	-	-	Mostly Fruits	Citraceae
52.	*Chenopodium album* L.	Wild spinach	Bathua	Leaves & Seeds	Chenopodiaceae
53.	*Oxalic corniculata* L.	Clover sorrel	Chooka	Whole plant	Oxalidaceae
54.	*Musa paradisica* L.	Banana	Kela	Fruits,Stems & Leaves	Musaceae
55.	*Mucuna pruriens* L.	Cow hage	Sema	Roots & Pods	Papilionaceae
56.	*Mimosa pudica* L.	-	Chui-mui	Whole plant	Fabaceae
57.	*Livistona jenkinsiana* Griff.	Major Jenkins palm	Chata palm	Fruits & Seeds	Arecaceae
58.	*Leucaena leucocephal* Lam.	Jumpy bean	Sirsha	Mostly seeds	Mimosaceae
59.	*Ipomoea aquatica* forssk.	Swamp cabbage, water spinach	Aquatic nari (saag wali)	Whole plant	Convolculaceae
60.	*Equisetum arvense* L.	Horse tail	Joram-tora	Whole plant	Equisetaceae
61.	*Dioscorea bulbifera* L.	Air potato, bitter yam	Jhamia aallu	Fruits & Leaves	Dioscoreaceae
62.	*Cyperus rotundus* L.	Nut grass	Bhada ghass	Whole plant	Cypraceae
63.	*Carica papaya* L.	Papaya	Papita		Fruits, Roots, Leaves
64.	*Azadirachta indica* A.Juss.	Neem	Neem	Barks,Leaves,& Fruits	Meliaceae
65.	*Aegle marmelos* L.	Bel	Bel	Fruits & Leaves	Rutaceae
66.	*Nelumbo nucifera* Gaertn.	Lotous	Kamal	Leaves, Roots & Fruits	Nelumbonaceae
67.	*Terminalia arjuna*	-	Arjun tree	Especially barks	Combretaceae

CONCLUSIONS

Thus, on the basis of above results and discussions, it may be concluded that medicinal plants of District Meerut, Uttar Pradesh state are considered as a very important sources of medicines for treatment of several types of human diseases such as asthma, leprosy, tuberculosis, blood vomiting, gonorrhoea, syphilis, leucorrhoea, kidney and gall stones, fever, pile problems ,cough & colds, bronchitis, diabetes, etc. and therefore, due to much usefulness of medicinal plants of this region ,protection and conservation of these plants is necessary to all of us for better survival and sustainable environment too. Also, it has been noticed that the favorable topography plays a vital role in the growth of different varieties of flora in this region and is directly related to soil topography and climatic conditions of the region. The more abundance the rainfall is the more growth is seen in these plants despite of some arid topography in the region, especially in west part of the district.

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