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. 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 source 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 28°59′ 24″N, 77°43′ 05″E
Terrain: 2590 sq km
Elevation: 224.659 m
Area: 70 km

Major River: Ganga

Rain Fall: 800 – 1000 mm/year

Temperature:

- Summer: Max. 43-45°C, Min. 19-21°C
- Winter: Max. 20-23°C, Min. 03-05°C

Villages: 667

Tehsil: 03 (Sardhana, Meerut, Mawana)
Blocks: 12 (Sardhana, Jani, Rohta, Saroorpur, Rajpura, Daurala, Kharkhoda, Meerut, Hastinapur, Parakshitgarh, Macchra, Mawanakalan)

Population: 3447405

Population Growth Rate During 2001 - 2011: 15.92%

Female: 885
Male: 1000

Literacy Percent: 74.80% (Male: 82.91% & Female: 65.69%)

*Corresponding Author

**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%  
**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**: 
- Buffaloes: 871681
- Cattle: 216931

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

<table>
<thead>
<tr>
<th>S. N.</th>
<th>Agro - Climatic Zone</th>
<th>Characteristics</th>
</tr>
</thead>
</table>
| 1    | Western Plain Zone   | 1. The zone includes districts of Muzaffarnagar, Meerut, Baghapat, Ghaziabad, Gautam Buddh 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 2.5°C to 43°C. Rice wheat sugarcane based cropping system is prevalent in the zone. |

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**Table 2.**

<table>
<thead>
<tr>
<th>Situation</th>
<th>Soil Type</th>
<th>PH</th>
<th>Farming System</th>
<th>Major Crops</th>
<th>Live Stock</th>
<th>Block</th>
</tr>
</thead>
<tbody>
<tr>
<td>AES I</td>
<td>Loam</td>
<td>7.5 - 8.5</td>
<td>Sugarcane-Ratoon-Wheat, Agro forestry and/or Jower-wheat (2-3 Graded buffalo/1 Cross bred cow)</td>
<td>Sugarcane, Wheat, Paddy, Potato, Vegetable, Jower</td>
<td>Buffalo, Cow, Poultry, Sheep &amp; Goat</td>
<td>Mawana, Jani, Parikhsetgargh, Machhra, Kharkoda, Rajpura, Meerut, Duralla, Sarthana, Saroopur, Rohta</td>
</tr>
<tr>
<td>AES II</td>
<td>Loam/Sand</td>
<td>7.0 - 8.0</td>
<td>Sorghum-Potato-Cucurbit and/or Sugarcane-Ratoon-Wheat (2-3 Graded buffalo/1 Cross bred cow)</td>
<td>Sugarcane, Potato, Wheat, Mango, Bajra, Jower</td>
<td>Buffalo, Cow, Poultry, Sheep &amp; Goat</td>
<td>Hastinapur, Parikhsetgargh, Machhra, Kharkhoda, Jani, Rohta, Saroopur, Sardhana</td>
</tr>
<tr>
<td>AES III</td>
<td>Sandy loam, Silty loam, Clay loam</td>
<td>7.5 - 7.9</td>
<td>Paddy-wheat and/or Jower-Wheat-Sugarcane-Ratoon-Wheat (2-3 Graded buffalo/1 Cross bred cow)</td>
<td>Sugarcane, Paddy, Wheat, Jower, Vegetable</td>
<td>Buffalo, Cow, Poultry, Sheep &amp; Goat</td>
<td>Hastinapur, Parikhsetgargh</td>
</tr>
</tbody>
</table>

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**Table 3.**

<table>
<thead>
<tr>
<th>S. N.</th>
<th>Soil Type</th>
<th>Characteristics</th>
<th>Area in ha</th>
</tr>
</thead>
</table>
| 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, pile 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, asthma & parasilis, 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 communis, Phyllanthus fraternus, Euphorbia hirta, Euphorbia nervifolia, Mentha spicata, Menth piperata, Leucas aspera, Ficus religiosa, Saccharum officinarum, Centella asiatica, Colocasia esculenta, Caloropsis gigantea, Punica granatum, Mucuna pruriens, Ipomoea aquatic, Euzusiutum arvense, Carica papaya, Azardicachta indica and Nelumbo nucifera, respectively, cured, 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 berr) 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

V.Family: Cucurbitaceae
9. Momordica charantia discout (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, 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 infections, 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 bowel 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 relieves 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. 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, Shahjanpur, Budaun & Bareilly districts.

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

XII. Family: Arecaceae 18. 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, throat infection and indigestion, piles problems. Distribution: Meerut, Bijnor, Muzaffernagar, Saharanpur, and other parts of the state.


XV. Family: Oxalidaceae 22. Oxalis 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.

VII. Family: Psidieae 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.

XVII. 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.

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

XX. Family: Mimosaceae 27. Leucaena leucocephala Lam. (Jumpy bean) Medicinal value: Against ascars parasites in human beings and cattle 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: Cypripedaee 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, Muzaffarnagar, 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, small pox, anti-poisonous, wounds and cuts etc. Distribution: Meerut, Bijnor, Bagpat, Muzaffarnagar, 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, Muzaffarnagar, Saharanpur, and other parts of the state.

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

<table>
<thead>
<tr>
<th>S. No</th>
<th>Botanical names</th>
<th>English name</th>
<th>Regional name</th>
<th>Plant parts used</th>
<th>Families</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><em>Solanum melongena</em> L.</td>
<td>Brinjal</td>
<td>Egg plant, Baigan</td>
<td>Leaves &amp; Fruits &amp; Bark</td>
<td>Solanaceae</td>
</tr>
<tr>
<td>2.</td>
<td><em>Physalis peruviana</em> L.</td>
<td>Golden Cape, goose berry</td>
<td>Badi Khish mukaiya</td>
<td>Fruits &amp; Bark</td>
<td>-do-</td>
</tr>
<tr>
<td>3.</td>
<td><em>Physalis minima</em> L.</td>
<td>Little goose berry</td>
<td>Choti khish mukaiya</td>
<td>Fruits &amp; Bark</td>
<td>-do-</td>
</tr>
<tr>
<td>4.</td>
<td><em>Lycopersicum esculentum</em> var. <em>cesauroforme</em></td>
<td>-</td>
<td>-</td>
<td>Mostly fruits</td>
<td>-do-</td>
</tr>
<tr>
<td>6.</td>
<td><em>Capsicum annuum</em> L.</td>
<td>Chilli</td>
<td>Hari lal mirch</td>
<td>Mostly Fruits</td>
<td>-do-</td>
</tr>
<tr>
<td>7.</td>
<td><em>Solanum jasminoides</em> Paxt.</td>
<td>Potato vine</td>
<td>-</td>
<td>Leaves &amp; Barks</td>
<td>-do-</td>
</tr>
<tr>
<td>8.</td>
<td><em>Solanum nigrum</em> L.</td>
<td>Black night shade</td>
<td>Kali mukaiya</td>
<td>Whole plant</td>
<td>-do-</td>
</tr>
<tr>
<td>9.</td>
<td><em>Celosia argentea</em> L.</td>
<td>Wool flower</td>
<td>Cock’s comb</td>
<td>Whole plant</td>
<td>Amaranthaceae</td>
</tr>
<tr>
<td>10.</td>
<td><em>Amaranthus spinosus</em> L.</td>
<td>Prickly amaranth</td>
<td>Kante wali kateli</td>
<td>Whole plant</td>
<td>-do-</td>
</tr>
<tr>
<td>11.</td>
<td><em>Amaranthus sp.</em></td>
<td>Amaranth</td>
<td>Chauraiya</td>
<td>Whole plant</td>
<td>-do-</td>
</tr>
<tr>
<td>12.</td>
<td><em>Amaranthus gangeicus</em> L.</td>
<td>Elephant-headed amaranth</td>
<td>Lal patte wali chaauriya</td>
<td>Whole plant</td>
<td>-do-</td>
</tr>
<tr>
<td>13.</td>
<td><em>Achyranthes aspera</em> L.</td>
<td>Devil’s horse whip</td>
<td>-</td>
<td>Whole plant</td>
<td>-do-</td>
</tr>
<tr>
<td>14.</td>
<td><em>Parthenium hysterophorus</em> L.</td>
<td>Camomille balais</td>
<td>Congress grass</td>
<td>Whole plant</td>
<td>Asteraceae</td>
</tr>
<tr>
<td>15.</td>
<td><em>Helianthus annuus</em> L.</td>
<td>Sun flower</td>
<td>Surajmukhi</td>
<td>Seeds</td>
<td>-do-</td>
</tr>
<tr>
<td>16.</td>
<td><em>Ageratum conyzoides</em> L.</td>
<td>Conyzoid floss flower</td>
<td>Bily goat weed &amp; Mahakua grass</td>
<td>Whole plant</td>
<td>-do-</td>
</tr>
<tr>
<td>17.</td>
<td><em>Acmella oleracea</em> L.</td>
<td>Toothache plant</td>
<td>Ghundi wala mahakua</td>
<td>Leaves, Fruits &amp; Roots</td>
<td>-do-</td>
</tr>
<tr>
<td>18.</td>
<td><em>Eclipta alba</em> L.</td>
<td>False daisy</td>
<td>Bhangarro</td>
<td>Whole plant</td>
<td>-do-</td>
</tr>
<tr>
<td>19.</td>
<td><em>Ricinus communis</em> L.</td>
<td>Caster bean</td>
<td>Arand &amp; Andauna</td>
<td>Leaves, Roots, seed oil &amp; Barks</td>
<td>Euphorbiaceae</td>
</tr>
<tr>
<td>20.</td>
<td><em>Phyllanthus fraternus</em></td>
<td>Phyllanthus</td>
<td>-</td>
<td>Leaves and fruits</td>
<td>-do-</td>
</tr>
<tr>
<td>21.</td>
<td><em>Euphorbia hirta</em> L.</td>
<td>Ashma weed</td>
<td>Jungali dudhi</td>
<td>Leaves, Fruits &amp; Roots</td>
<td>-do-</td>
</tr>
<tr>
<td>22.</td>
<td><em>Euphorbia nerrifolia</em> L.</td>
<td>Common milk hedge</td>
<td>General dudhi</td>
<td>Roots &amp; latex</td>
<td>-do-</td>
</tr>
<tr>
<td>23.</td>
<td><em>Momordica charantia</em> L.</td>
<td>Bitter gourd</td>
<td>Lamba karela</td>
<td>Leaves, Fruits &amp; Roots</td>
<td>Cucurbitaceae</td>
</tr>
<tr>
<td>24.</td>
<td><em>Momordica halsamina</em> L.</td>
<td>Balsam apple</td>
<td>Chota karela</td>
<td>Leaves, Fruits &amp; Seeds</td>
<td>-do-</td>
</tr>
<tr>
<td>25.</td>
<td><em>Luffa cylindrical</em> L.</td>
<td>Sponge gourd</td>
<td>-</td>
<td>Fruits &amp; Seeds</td>
<td>-do-</td>
</tr>
<tr>
<td>26.</td>
<td><em>Urena lobata</em> L.</td>
<td>-</td>
<td>Bhaivy</td>
<td>Root &amp; Leaves</td>
<td>Malvaceae</td>
</tr>
<tr>
<td>27.</td>
<td><em>Hibiscus rosa-sinensis</em> L.</td>
<td>Rose</td>
<td>Gulab</td>
<td>Leaves, Stem &amp; Fruits</td>
<td>-do-</td>
</tr>
<tr>
<td>28.</td>
<td><em>Mentha spicata</em> L.</td>
<td>Garden mint, Spearmint</td>
<td>Wild shvali</td>
<td>Mostly leaves</td>
<td>Lamiaceae</td>
</tr>
<tr>
<td>29.</td>
<td><em>Mentha piperata</em> L.</td>
<td>Pipermint</td>
<td>Shivali</td>
<td>Leaves &amp; seeds oil</td>
<td>-do-</td>
</tr>
<tr>
<td>30.</td>
<td><em>Lecuas aspera</em> Willd.</td>
<td>Common leucas</td>
<td>-</td>
<td>Whole plant</td>
<td>-do-</td>
</tr>
<tr>
<td>31.</td>
<td><em>Ficus indica</em> L.</td>
<td>Indian fig, Banyan tree</td>
<td>Bagad</td>
<td>Fruits</td>
<td>Moraceae</td>
</tr>
<tr>
<td>32.</td>
<td><em>Ficus religiosa</em> L.</td>
<td>-</td>
<td>Peepal tree</td>
<td>Leaves, Bark &amp; Fruits</td>
<td>-do-</td>
</tr>
<tr>
<td>33.</td>
<td><em>Altocarpus heterophyllus</em> Lam.</td>
<td>Tack fruit</td>
<td>Kathal</td>
<td>Bark, Root &amp; Seeds</td>
<td>-do-</td>
</tr>
<tr>
<td>34.</td>
<td><em>Rumex crispus</em> L.</td>
<td>Curly dock</td>
<td>Wild &amp; small talpalaki</td>
<td>Leaves &amp; Roots</td>
<td>Polygonaceae</td>
</tr>
<tr>
<td>35.</td>
<td><em>Rumex acetosa</em> L.</td>
<td>Sorrel</td>
<td>Wild &amp; large talpalaki</td>
<td>Leaves &amp; Roots</td>
<td>-do-</td>
</tr>
<tr>
<td>36.</td>
<td><em>Tagetes erecta</em> L.</td>
<td>Marry gold</td>
<td>Genda</td>
<td>Whole plant</td>
<td>Compositae</td>
</tr>
<tr>
<td>37.</td>
<td><em>Zea mays</em></td>
<td>Maize, Gluttonious corn</td>
<td>Makka</td>
<td>Corn, silk &amp; Corn meal</td>
<td>Poaceae</td>
</tr>
<tr>
<td>38.</td>
<td><em>Saccharum officinarum</em> L.</td>
<td>Sugarcane</td>
<td>Ganna</td>
<td>Culms</td>
<td>-do-</td>
</tr>
<tr>
<td>39.</td>
<td><em>Cannabis sativa</em> L.</td>
<td>Marijuana, hemp</td>
<td>Bhang</td>
<td>Leaves &amp; Fruits</td>
<td>Cannabaceae</td>
</tr>
<tr>
<td>40.</td>
<td><em>Sesuvium portulacastrum</em> L.</td>
<td>Shoreline purslane</td>
<td>Wild gaddadi</td>
<td>Whole plant</td>
<td>Aizoaceae</td>
</tr>
</tbody>
</table>
41. Aloe vera L. Century plant - Whole plant Agaraceae
42. Centella asiatica L. Indian penny wort Brahmi Whole plant Umbelliferae
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 - Leaves & Corn -
46. Calotropis gigantea L. Madar, Crown flower Akana Whole plant Asclepiadaceae
47. Argemone mexicana L. Mexican poppy Kataiya Leaves, Seeds & Roots Papaveraceae
48. Antheceplas chinesis L. Kadam Kadam Leaves, Fruits & Barks Rubiaceae
49. Clerodendrum viscosum Vent. Hill glory bower Bhatt plant Mostly Leaves Verbenaceae
50. Panica grauntum L. - Anar Leaves & Fruits Punicaceae
51. Citrus sp. - - Mostly Fruits Citraceae
52. Chenopodium album L. Wild spinach Bathua Leaves & Seeds Chenopodiaceae
53. Osoril corniculata L. Clover sorrel Chooka Whole plant Oxalidaceae
54. Musa paradisica L. Banana Kela Fruits, Stems & Leaves Musaceae
55. Macuna pruriens L. Cow hage Sema Roots & Pods Papilionaceae
56. Mimosedia 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 Forsk. Swamp cabbage, water Aquatic nari (saag (saag wali) Whole plant Convolvulaceae
60. Equisetum arvense L. Horse tail Joram-tora Whole plant Equisetaceae
61. Dioscorea bulbifera L. Air potato, bitter yam Hamaa aalai Fruits & Leaves Dioscoreaceae
62. Cyperus rotundus L. Nut grass Bhada ghass Whole plant Cyperaceae
63. Carica papaya L. Papaya Papita Fruits, Roots, Leaves Meliaceae
64. Azadirachta indica A.Juss. Neem Neem Barks, Leaves, & Fruits Meliaceae
65. Argel marello L. Bel Bel Fruits & Leaves Rutaceae
66. Nelumbo nucifera Gaertn. Lotus 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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REFERENCES

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Kisan Vigan Kendra, Meerut.


