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Selection of Medicinal plants for cultivation in J. P. Nagar District (U.P.) to raise Socio-economy of farmers

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Abstract
Medicinal plants shows an important position in Ayurveda, Siddha and Unani medicine; and provide raw materials for cosmetic, drug, pharmaceuticals and other industries. Farmers can raise income via cultivation of the medicinal plants than other traditional crops. National Medicinal Plant Board (NMPB), India provide subsidy according to different plant species availability for production. Around 140 medicinal plants species listed under National Ayush Mission for cultivation. From which *ca.* 40 angiosperm plant species of climbers, herbs, shrubs and trees are found commonly and some are wild in Jyotiba Phule Nagar (Amroha) District of Uttar Pradesh. Cultivation of medicinal plants is the very good alternative for some traditional uneconomic crops for raise socio economy of farmers and help in medicinal plant protection.

Keywords: Medicinal plants, farmers, income, cultivation, Jyotiba Phule Nagar (Amroha) District

Introduction
Jyotiba Phule Nagar (Amroha) is north-western district of Uttar Pradesh. The district came into existence on April 24, 1997 in the memory of St. Mahatama Jyotiba Phule by combining 6 blocks namely Amroha, Dhanora, Gangeshwari, Gazrola, Hasanpur and Joya, and of 3 Tehsils Amroha, Dhanora & Hasanpur (Fig.-1). The geographical area of district is about 2470 Km^2, extending from Latitude 28° 54' N to 39° 6' N and Longitude 78° 28' E to 78° 39' E. The maximum & minimum elevation above sea level is 73.152 m. & 53.94 m. The maximum and minimum atmospheric temperatures are 43°C and 4°C respectively (Fig. 1).

Uses of medicinal plants in India, have been done for medicinal and other purposes from ancient times. About thousands of native plants have medicinal importance. In India, Ayurveda, Unani and Siddha medicines are of huge demands. According to the WHO, "medicinal plant is the plant which contains substances that can be used for therapeutically, or which are precursors for phytopharmaceutical semi synthesis". Collection and processing of medicinal plants and their products in India is contributes a major part to the national economy, as a source of both full and part time employment. Today's much of the World's population largely depend on traditional medicine plant to meet daily health requirements, especially developing countries. Remedies dependent on plants products are widespread in many industrialized countries. Alike, cosmetics and other household products are derivatives of medicinal or therapeutic plants. The MoEF, Govt. of India have acknowledged and recorded more than *ca.* 9,000 plant species for their importance in the medicinal and healthcare industry. Among these, *ca.* 65 plants have huge and reliable demand in world market. While in India, these materials are produced in very limited quantities. India is on 6th place with about 7 % of contribution in global market of production of plants products [17]. The global market of herbal medicine and their products is expanding tremendously. In 2004 the market was US $62 billion and it will reach to about US $5 trillion by 2050. In India, trade of medicinal plants is *ca.* US $1 billion per year [15]. Use of herbal medicines is safer than modern medicine; and reduces the side effects. India is a diverse and wealthy country in relation to medicinal plants, but due to lack of awareness and knowledge among Indian farmers about economic values and income generation from medicinal plants production, unfortunately achieve low success in trading of medicinal plant products [13, 18, 19]. Some other workers done documentary work in medicinal farming for income generation of farmers [1, 2, 4, 7, 8, 9, 10, 14, 16].

Material and Methods
Field trips were made during 2017–18 in frequent manner in different seasons. For documentation of the medicinal plant species, websites of National Medicinal Plant Board have been consulted [11, 12]. Plant specimens were collected, processed by standard herbarium methods [3, 6]. Identification of collected plants specimens has been done by morphological basis with available literature [5, 20]. Online database like The Plant List and The International Plant Name Index were referred for correct nomenclature and author citations [21, 22]. The herbarium sheets were preserved in Department of Botany, Hindu College, and Moradabad for future use.

Result & Discussion
The present study documented 40 medicinal angiosperms plants belonging to 25 families (Table-1). Dominant families are Fabaceae (8 spp.), Lamiaceae and Apocynaceae (3 spp. each), Acanthaceae, Phyllanthaceae, Plantaginceae and Solanaceae (2 spp. each) which have potential value in local market. Parts of plants used for medicinal purpose are Leaves (25 %), Whole plant (17 %), Root (16 %), Seed (12 %), Bark and Flower (9 %), Fruit and Latex (3 %), Stem, Tuber and Pod (2 %) (Fig. 2).

Medicinal plant's demands are increasing rapidly in future,

and fuelled by the growth of sales of herbal supplements and remedies. The leading benefits of medicinal plants cultivation for farmers are reduction of risk of crop failure and improved access to local markets. Besides that, farmers assured higher returns in comparison to traditional crops and increase the traditional knowledge of medicinal plants. Farmers can grow some selected plants species according to their suitability and generate their income. These medicinal and aromatic plants are the ideal alternative for some traditional uneconomic crops and help in medicinal plant protection.

Table 1: List of Medicinal plants [Subsidy by NMPB, India]

S. No.	Plant Names	Family	Common Names	Parts Used
1.	*Abrus precatorius* L.	Fabaceae	Ratti	L, Sd, R
2.	*Acacia catechu* Willd.	Fabaceae	Kattha	Fr
3.	*Achyranthes aspera* L.	Amaranthaceae	Latjira	Wp
4.	*Aegle marmelos* (L.) Corr.	Rutaceae	Bel	Fr, L
5.	*Albizzia lebbeck* Benth.	Fabaceae	Siris	Br
6.	*Aloe vera* (L.) Burm.	Asphodelaceae	Ghratkumari	L
7.	*Alstonia scholaris* R.Br.	Apocynaceae	Saptparni	Br, L, Lt
8.	*Andrographis paniculate* (L.) Burm.	Acanthaceae	Kalmegh	Wp
9.	*Asparagus racemosus* Willd.	Asparagaceae	Shatavar	R, L
10.	*Azadirachta indica* A. Juss	Meliaceae	Neem	L, Br, R, Sd
11.	*Bacopa monnieri* (L.) Pennell	Plantaginaceae	Bramhi	Wp
12.	*Boerhaavia diffusa* L.	Nyctaginaceae	Punarva	Wp
13.	*Catharanthus roseus* (L.) G. Don	Apocynaceae	Sadabahar	Fl, L, R
14.	*Cinnamomum tamala* (Buch.-Ham.) Nees et Eberm.	Lauraceae	Tejpat	L, Br,
15.	*Clitoria ternatea* L.	Fabaceae	Aprajita	Fl
16.	*Commiphora wightii* (Arn.) Bhandari	Burseraceae	Guggal	Lt
17.	*Convolvulus microphyllus* Sieb. ex Spreng.	Convolvulaceae	Shankhpushpi	Wp
18.	*Dioscorea bulbifera* L.	Dioscoreaceae	Aalu ki bel	R, T
19.	*Eclipta alba* Hassk.	Asteraceae	Bhrangraj	Wp
20.	*Gloriosa superba* L.	Colchicaceae	Kalihari	Sd, R
21.	*Justicia adhatoda* L.	Acanthaceae	Adusa	Fl, L
22.	*Lepidium sativum* L.	Brassicaceae	Chandrasur	Wp
23.	*Ocimum tenuiflorum* L.	Lamiaceae	Tulsi	L, Sd, R
24.	*Phyllanthus amarus* Schum & Thonn.	Phyllanthaceae	Bhumi amla	Wp
25.	*Phyllanthus emblica* L.	Phyllanthaceae	Amla	Fr, Sd
26.	*Plantago ovata* Forssk.	Plantaginaceae	Isabgoal	Sd
27.	*Plectranthus barbatus* Andrews	Lamiaceae	Pather chur	L, Sd
28.	*Plumbago zeylanica* L.	Plumbaginaceae	Chitrak	Wp
29.	*Pterocarpus marsupium* Roxb.	Fabaceae	Beejasar	L, Fl
30.	*Rauwolfia serpentine* Benth. ex Kurz	Apocynaceae	Sarpgandha	R
31.	*Saraca asoca* L.	Fabaceae	Ashok	Br, Fl
32.	*Senna alexandrina* Mill.	Fabaceae	Senna	P
33.	*Sida cordifolia* L.	Malvaceae	Sida	Sd, L, R
34.	*Solanum nigrum* L.	Solanaceae	Makoi	Wp
35.	*Tecomella undulata* (Sm.) Seem.	Bignoniaceae	Rohitak	Br, Sd
36.	*Tephrosia purpurea* Pers.	Fabaceae	Srphonk	Wp
37.	*Terminalia arjuna* (Roxb.) Wt. & Arn.	Combretaceae	Arjun	Br, L
38.	*Tinospora cordifolia* Miers.	Menispermaceae	Giloi	St, L
39.	*Vitex negundo* L.	Lamiaceae	Nirgundi	L, Fl, R
40.	*Withania somnifera* (L.) Dunal.	Solanaceae	Ashwagandha	R

(Wp = Whole plant, L = Leaves, R =Root, St = Stem, Sd = Seeds, Br = Bark, Lt = Latex, Fl = Flower, Fr = Fruit, P = Pod, T= Tuber)

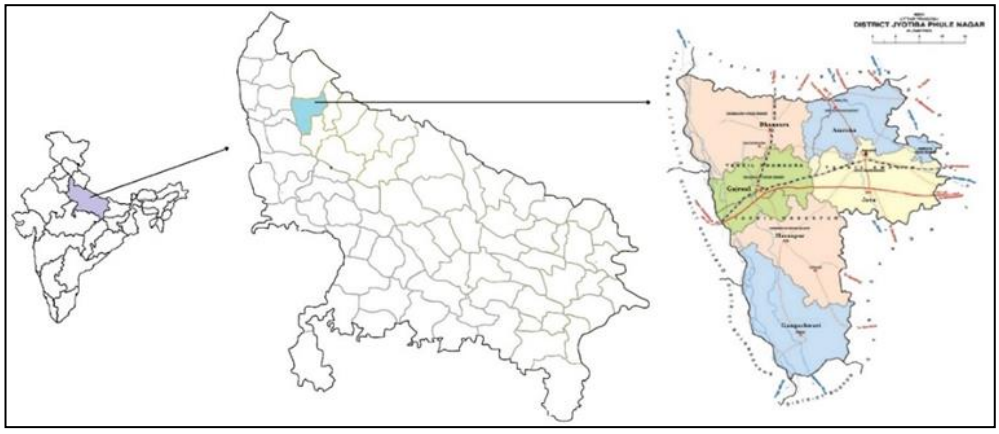

Fig 1: Map of Study Area

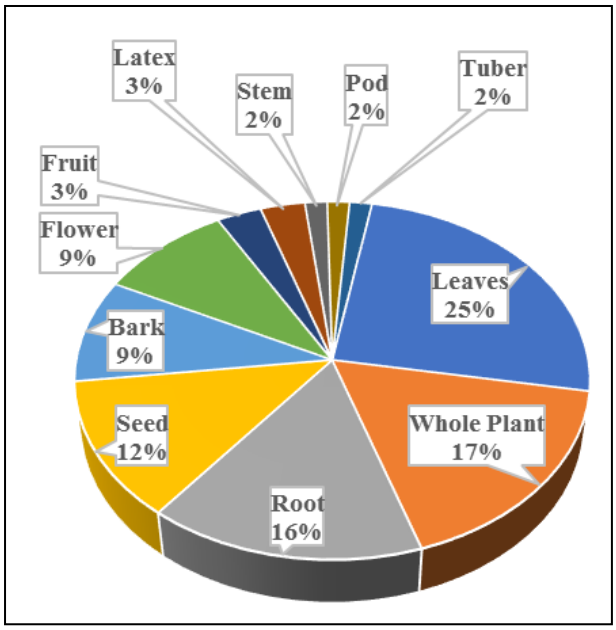

Fig 2: Plant's parts used to extract medicines

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