A Study on Diversity of Unani Medicinal Plants Used for Non-Communicable Diseases in Southern Western Ghats of Tamil Nadu

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Abstract

A series of medicinal plants collection trips to various forest regions of South Western Ghats of Tamil Nadu, have brought to light 53 plants species widely used in the study area to treat certain non-communicable diseases as per Unani text. All species collected have been analyzed in respect of their diversity, life form and taxonomic category. The study reveals that many such species are either rare or endangered and needs immediate attention for their conservation and protection, through germiplasm collection initiatives before these are lost for ever. All species have been listed providing information on their botanical name, family, Unani name, therapeutic uses as per Unani text. Further scientific studies are suggested with a view to discover new drugs of plant origin to combat many such non-communicable diseases, hitherto incurable, in modern medicine.

Keywords: Medicinal Plants, Western Ghats, Non-Communicable disease, Unani System of Medicine

Introduction

The greatest public health challenge of 21st century is chronic non-communicable diseases (Anderson and Chu, 2007). Approximately 36 million deaths were attributable to NCDs in the year 2008 due to diabetes and cardiovascular diseases alone (Alwan *et al.*, 2011). India is endowed with rich wealth of medicinal plants which are widely used by all section of peoples either directly or as folk remedies in different indigenous systems of medicine or indirectly in the pharmaceutical preparations of modern medicines (Alagesaboopathy, 2011). Medicinal plants are distributed across diverse habitats and land scape elements. Around 70% of India's medicinal plants are found in to tropical areas mostly in the four types spread across the Western Ghats and Eastern Ghats, Vindiyas, Chotta Nagpur Plateau, Aravalis & Himalayas. (Sankar Murthy and Kiran, 2012).

India is experiencing great pressure on its resources due to growing demand of the herbal products in the domestic and global markets. During the past two decades the human activities on commercialization of plant based drugs and demand from the pharmaceutical industry for domestic needs and the export of herbal drugs have led scarcity of medicinal plants in forests and plains. The natural forests should be conserved seriously to protect many of the economically important medicinal plants. The utility and need of botanical exploration in the country is to identify and search the economically important medicinal plants which has to be propagated and conserved for future generation (Balakrishnan *et al.*,

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2009). In the present study, a large number of medicinal plants were collected and identified from the southern region in recent years.

The Survey of Medicinal Plants Unit of the Regional Research Institute of Unani Medicine, Chennai has been extensively involved in medicinal plants survey and collection trips in different parts of Tamil Nadu for over three decades. The present report provides information on some 53 important medicinal species as per Unani text and widely used for treating non-communicable and other diseases in the study area. Study also analysed the diversity of Unani medicinal plants flora in respect of their diversity and the predominant families for the study area.

The Study Area

Southern Western Ghats of Tamil Nadu are one of the important medicinal plants biodiversity hotspots in the country and spread over in the districts of Coimbatore, Nilgiris, Theni, Tirunelveli and Kannyakumari. The vegetation of this area comprise evergreen, deciduous, scrub jungles and shola forests. Many of the forest areas are rich in tribal populations. The Western Ghats mountain range runs parallel to the West coast of Peninsular India for about 1600km. It has very rich floristic diversity; about 4000 indigenous angiosperm species which includes 1500 endemic plant species.

Methodology

A series of medicinal plants surveys were conducted in different seasons at Southern Western Ghats forest region of Tamil Nadu. 53 species of wild medicinal plants species which are used in the Unani system of medicine are reported in the present paper with their therapeutic uses. The medicinal species have been identified through modern floras (Gamble, 1928; Kirtikar & Basu, 1933; Nair & Henry, 1983; Mathew, 1983) and confirmed at Botanical survey of India, Coimbatore. The plants are arranged alphabetically according to their botanical names with collection number, followed by family, Unani name, and their uses in the Unani system of medicine (Table-I).

Results and Discussion

In the present study 53 Unani medicinal plants used for non-communicable disease as per classical text have been collected (Fig. 4-9) from Western Ghats region of Tamil Nadu (Table-1) and analyzed for their diversity status. Of these, 32 species are common, 13 falls in sporadic distribution which is very much restricted to particular area, 8 vulnerable, 5 rare and 1 species each is in endangered category, respectively (Fig.1). In the life form analysis 21 species of herbs, 18 species of

trees, 9 species of climbers, twiners and creepers and 5 species of shrubs were collected and identified (Fig:2).

According to the systematic classification, the taxonomic hierarchy has also been analyzed in which 53 species, belonging to 51 genus and 32 family are recorded for the study area (Fig: 3). The study also revealed that largest families of the study area are Apocynaceae, Caesalpiniaceae and Euphorbiaceae with 4 species each, followed by Amaranthaceae, Solanaceae with each 3 species, similarly Asclepiadeceae, Combretaceae, Fabaceae, Liliaceae, Loganiaceae, Malvaceae and Rubiaceae possess 2 species each and other families possess 1 species each respectively.

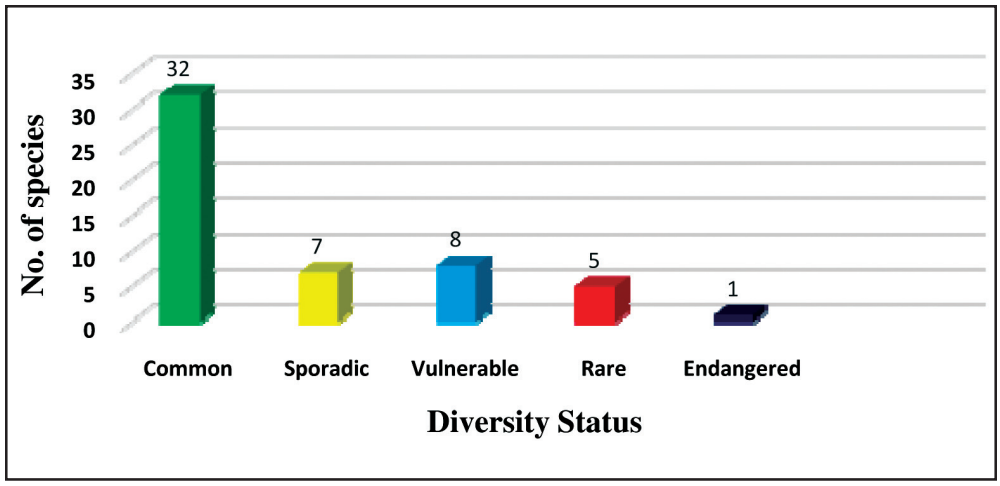

Fig. 1: Analysis of diversity of Unani medicinal plants with respect to no. of species in the study area

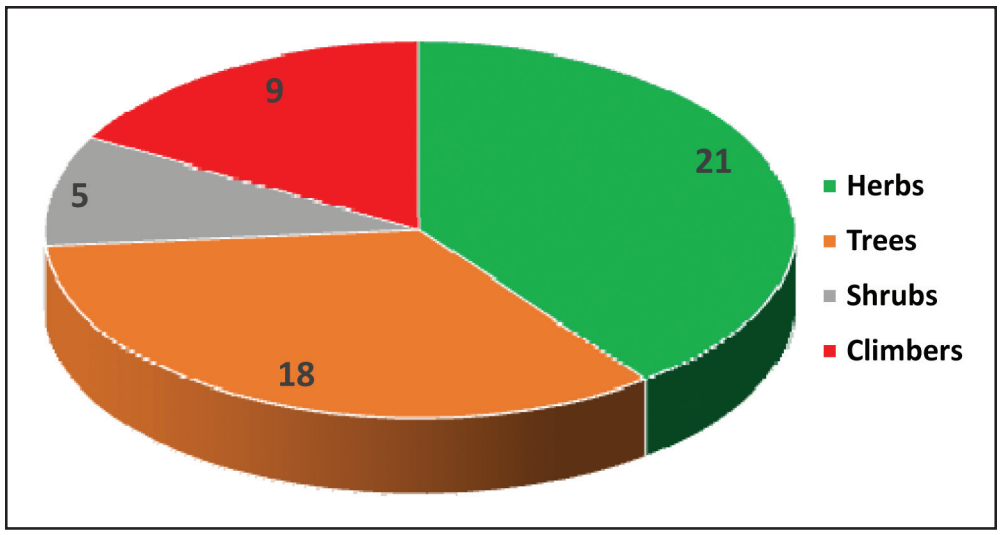

Fig. 2: Analysis of Unani medicinal plants life forms with respect to no. of species in the study

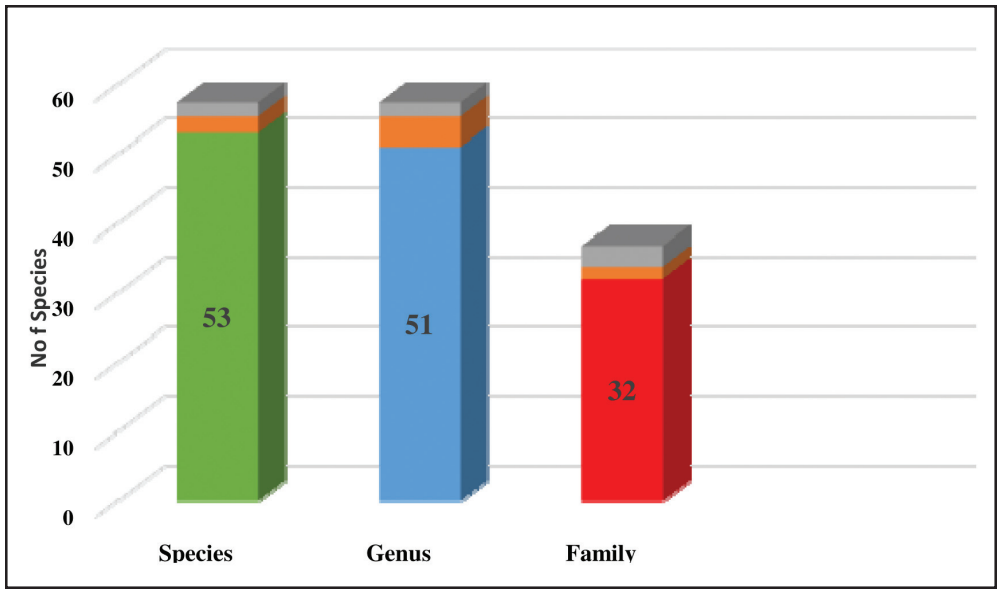

Fig. 3: Analysis of taxonomical ranks of Unani medicinal plants with respect to number of species in the study

The medicinal plants are used in Unani system of medicine for various ailments like anthelmintic, arthritis, astringent, aphrodisiac, bleeding hemorrhoids, diarrhoea, dysentery, gastric ulcer, headache, inflammation and stomach disorders are among them. Some of the important plant species used are Amaltas (*Cassia fistula* L.), Amla (*Phyllanthus embilica* L.), Bijasar (*Pterocarpus marsupium* L.), Bhuiamla (*Phyllanthus amarus* L.), Chalmugrah (*Hidnocarpus laurifolia* (Dennst.) Sleumer.,Chungchi (*Abrus precatorius* L.), Dudhi (*Euphorabia hirta* L.), Gilo (*Tinospora cordifolia* (Willd.) Miers), Gul-e-abbas (*Mirabilis jalapa* L.), Gul-e-dahwa (*Anogeissus latifolius* (Roxb.ex DC.) Bedd.), Halela (*Terminalia chebula* L.), Inderjo shirin (*Wrightia tinctorea* R.Br.), Kamila (*Mallotus philippensis* (Lam.) Mull.-Arg.), Kasoos (*Cuscuta reflexa* Roxb.).Katai (*Solanum virginianum* L.), Lajwanti (*Mimosa pudica* L.), Mainphal (*Catunaregam spinosa* (Thumb.) Tirveng., Marorphali (*Helicteres isora* L.) Muleem (*Gloriosa superba* L.), Neem (*Azadirachta indica* (L.) A. Juss), Panwar (*Cassia tora* L.), Patharphodi (*Aerva lanata* (L.) Jes, Qil qil (*Cardiospermum halicacabum* L.)Sadabhagar (*Vinca rosea* L.),Sambhalu (*Vitex negundo* L.), Santhal safaid (*Santalum album* L.), Sheetraj Hindi (*Plumbago zeylanica* L.), Talmakhana (*Hygrophila auriculata* (Schum.) Heine, Tarwar (*Cassisa auriculata* L.), Zarawand (*Aristolochia indica* L.) etc., were exemplified and have been discussed for their diversity status.

It has been observed that the plant species like Asgand (*Withania somnifera* Dunal), Chalmugrah (*Hidnocarpus laurifolia* (Dennst.) Sleumer.) Darchini (*Cinnamomum verum* Presl.), Ghungchi *(Abrus precatorius* L.), Kashim (*Alstonia scholaris* R.Br.), Gul-e-Dhawa (*Anogeissus latifolius* (Roxb. ex DC.) Wall. *ex* Guill. & Perr.), Chironji

Table 1: List of Unani Medicinal Plants Used for Non-Communicable Diseases in Southern Western Ghats of Tamil Nadu, India

Sl. No.	Botanical Name & Collection No.	Family	Unani Name	Uses in the Unani System of Medicine	Status
1	*Abrus precatorius* L. SMPU, CH- 8611	Fabaceae	Ghungchi	Seeds are used as anti-inflammatory, and stimulant. Used in nerve disorders and ulcer.	V
2	*Abutilon indicum* (L.) Sweet SMPU, CH-8511	Malvaceae	Kanghi	Leaves are used in bleeding piles, constipation and used as aphrodisiac and analgesic.	C
3	*Achyranthes aspera* L. SMPU, CH 8491	Amaran-thaceae	Chirchita	Whole plant used in dropsy.	C
4	*Aerva lanata* (L.) A. Juss. Ex Schult. SMPU, CH-8455	Amaran-thaceae	Pathar-phodi	Whole plant used as diuretic and demulcent.	C
5	*Alstonia scholaris* R.Br. SMPU, CH-8590	Apocyna-ceae	Kashim	Root used as carminative, digestive, stomachic, used to expel intestinal worms, dropsy and hemiplegia.	S
6	*Amaranthus spinosus* L. - SMPU, CH-8572	Amaran-thaceae	Kateeli chauli	Root used as appetizer, carminative and anti-inflammatory.	C
7	*Anogeissus latifolius* (Roxb. ex DC.) Wall. *ex* Guill. & Perr. SMPU, CH-8474	Combreta-ceae	Gul-e-Dhawa	Flowers are used in . constipation, diarrhea, leucorrhoea, and intestinal worms	S
8	*Argemone mexicana* L. SMPU, CH-8561	Papavara-ceae	Satyanasi	Plant used as diuretic. Juice of shoot used as purgative, and used as blood purifier. Seeds used in constipation, also used as antiseptic. Oil of seeds used as purgative and root used as tonic.	C
9	*Aristolochia indica* L. SMPU, CH-8689	Aristolo-chiaceae	Zarawand	Seeds and roots are used in general debility, amenorrhea and wounds, Used as antidote for poison.	R
10	*Asparagus recemosus* Willd. - SMPU, CH-8682	Liliaceae	Satawar	Root powder used as diuretic, aphrodisiac, antidiarrheal, nervine tonic and used in rheumatic complaints.	R

Table 1: *(Continued)*

Sl. No.	Botanical Name & Collection No.	Family	Unani Name	Uses in the Unani System of Medicine	Status
11	*Buchanania lanzan* Spreng. - SMPU, CH-8542	Anacardiaceae	Chironji	Kernel used as aphrodisiac and in sexual debility and body weakness.	S
12	*Calotropis gigantea* (L.) R.Br. *ex* Ait. SMPU, CH-8592	Asclepiadeceae	Madar	Root bark used as analgesic, digestive, antidysenteric, expectorant, arthritis. Used in asthma, general debility, Flowers used as analgesic, stomachic and expectorant. Latex used in piles.	C
13	*Cardiospermum halicacabum* L. SMPU, CH-8444	Sapindaceae	Qil Qil	Seeds used as aphrodisiac.	C
14	*Cassia auriculata* L. SMPU, CH-8565	Caesalpiniaceae	Tarwar	Leaves, flowers and roots are used in diabeties, diarrhea and cardiac tonic.	C
15	*Cassia fistula* L. - SMPU, CH-8454	Caesalpiniaceae	Amaltas	Fruit pulp, rind of the fruit and leaves are used in constipation, asthma, rheumatism.	C
16	*Cassia tora* L. SMPU, CH-8589	Caesalpiniaceae	Panwar	Seeds used as blood purifier. Used in asthma.	C
17	*Catharanthus roseus* (L.) G. Don. SMPU, CH-8496	Apocynaceae	Sadabahar	Leaves and roots are used in haemorrhage and constipation.	C
18	*Catunaregam spinosa* (Thumb.) Tiruveng. SMPU, CH-8494	Rubiaceae	Mainphal	Fruits used as purgative, carminative and inflammation. Used in paralysis.	C
19	*Cinnamomum verum* Presl. SMPU, CH-8802	Lauraceae	Darchini	Bark and oil are used as liver tonic, carminative, expectorant, used in piles and inflammations.	V
20	*Citrus limon* (L.) Burm.f. SMPU, CH-8527	Rutaceae	Neembu	Fruit used in brain tonic, constipation, cardiac tonic, exhilarant, carminative and digestive.	C
21	*Curcuma longa* L. SMPU, CH-8609	Zingiberaceae	Zard Chob Haldi	Rhizome used as anti-inflammatory, expectorant, used in ulcers, asthma.	C/C

Table 1: *(Continued)*

Sl. No.	Botanical Name & Collection No.	Family	Unani Name	Uses in the Unani System of Medicine	Status
22	*Cuscuta reflexa* Roxb. SMPU, CH-8451	Convolvulaceae	Kasoos	Seeds used as purgative, carminative, diuretic, anti-inflammatory, blood purifier. Used in brain diseases, epilepsy, paralysis, arthritis.	C
23	*Datura metel* L. SMPU, CH-8570	Solanaceae	Jaoz Masil, Dhatura	Leaves used as analgesic, and anesthetic, used in joint pain.	C
24	*Euphorbia hirta* L. SMPU, CH 8524	Euphorbiaceae	Dudhi	Whole plant used as demulcent, constipation, expectorant, and aphrodisiac.	C
25	*Gloriosa superba* L. SMPU, CH-8622	Liliaceae	Muleem	Root used as astringent, expectorant. Used in bleeding piles.	S
26	*Gymnema sylvestre* R. Br. SMPU, CH-8529	Asclepiadaceae	Gurmarbuti	Leaves used in polyuria, heart diseases and diabetes.	R
27	*Helicteres isora* L. SMPU, CH-8493	Sterculiaceae	Marorphali	Root and bark are used in stomach ache.	C
28	*Hibiscus rosa-sinensis* L. SMPU, CH- 8442	Malvaceae	Gudhal	Flowers, leaves, seeds and roots are used as exhilarant, cardio tonic, demulcent and aphrodisiac. Used in dysuria, palpitation, weakness of spleen.	C
29	*Hydnocarpus laurifolia* (Dennst.) Sleumer SMPU, CH-8791	Flacourtiaceae	Chalmugrah	Seeds, oil used in wounds.	V
30	*Hygrophylla auriculata* (Schum.) Heine SMPU, CH- 8568	Acanthaceae	Talmakhana	Seeds, roots are used as sedative, diuretic, arthritis, gonorrhea, renal calculus, and aphrodisiac.	V
31	*Leonotis nepetiifolia* (L.) R.Br. - SMPU, CH-8668	Lamiaceae	Dipmal	Flowering heads are used as laxative, emmenagogue	S
32	*Limonia acidissima* L. SMPU, CH-8564	Rutaceae	Kaith	Fruit and leaves are used as cardio tonic, liver tonic, refrigerant, astringent, strengthening the gum and diuretic.	V

Table 1: *(Continued)*

Sl. No.	Botanical Name & Collection No.	Family	Unani Name	Uses in the Unani System of Medicine	Status
33	*Mallotus phillipensis* (Lam.) Muell.-Arg. SMPU, CH- 8441	Euphorbiaceae	Kamila	Tree, fruit capsule, red-glandular, common; fruits are used as antiseptic and in otorrhoea.	C
34	*Mimosa pudica* L. SMPU, CH-8456	Mimosaceae	Lajwanti	Leaves used as analgesic, and in intestinal worms.	C
35	*Mimosops elangi* L. SMPU, CH-8651	Sapotaceae	Mulsari	Root used as aphrodisiac, diuretic and astringent.	R
36	*Mirabilis jalapa* L. SMPU, CH-8458	Nyctaginaceae	Gul-e-Abbas	Leaves used as anti-inflammation, in dropsy and jaundice. Flowers used in piles. Root used in joint pain, and sexual debility. Seeds used in leucorrhoea.	C
37	*Momodica charantia* L. SMPU, CH-8552	Cucurbitaceae	Karaila	Fruit used as nervine tonic, aphrodisiac. Used in joint pain, gout, dropsy, intestinal worms Leaves used as anti-bilious.	C/C
38	*Nerium oleander* L. SMPU, CH-8539	Apocynaceae	Kaner	Root used as aphrodisiac and blood purifier. Used in sexual debility. Leaves used as blood purifier. Used in paralysis.	C
39	*Phyllanthus emblica* L. SMPU, CH-8873	Euphorbiaceae	Amla	Fruits used in weakness of brain, amnesia, head ache, gastric ulcer, and diarrhoea.	C/C
40	*Piper nigrum* L. SMPU, CH-8452	Piperaceae	Filfil Siyah	Fruits used as expectorant, stomach tonic, aphrodisiac, appetizer, carminative. Root used as digestive, carminative. Used in weakness of stomach.	C/C
41	*Plumbago zeylanica* L. SMPU, CH-8457	Plumbaginaceae	Sheetraj Hindi	Roots and leaves are used in arthritis, and facial paralysis.	S
42	*Pterocarpus marsupium*. Roxb. - SMPU, CH-8755	Fabaceae	Bijasar	Gum used as anthelmintic and opthalmia.	V

Table 1: *(Continued)*

Sl. No.	Botanical Name & Collection No.	Family	Unani Name	Uses in the Unani System of Medicine	Status
43	*Ricinus communis* L. SMPU, CH-8563	Euphorbiaceae	Arand, Bedanjeer	Seeds used as anti-inflammatory, purgative. Leaves used as purgative. Oil of seed used as purgative and anti-inflammatory. Used in colic, constipation, worm infestations and joint pain.	C
44	*Rubia cordifolia* L. SMPU, CH-8447	Rubiaceae	Majeed	Roots used in retention of urine, bleeding hemorrhoids and emmenagogue.	C
45	*Santalum album* L. SMPU, CH-8652	Santalaceae	Sandal Safaid	Wood used as exhilarant, antiseptic, expectorant, cardiac tonic and astringent. Oil of the wood used in gonorrhea.	E
46	*Solanum virginianum* L. SMPU, CH-8790	Solanaceae	Katai khurd	Fruits and roots are used as laxative, inflammation and anthelmintic.	C
47	*Strychnos nux-vomica* L. SMPU, CH-8566	Loganiaceae	Kuchla	Fruits are used as tonic, aphrodisiac, diuretic and emmenagogue.	V
48	*Strychnos potatorum* L. SMPU, CH-8532	Loganiaceae	Nirmali	Seeds used as astringent, aphrodisiac and diuretic.	V
49	*Tamarindus indica* L. SMPU, CH-8445	Caesalpiniaceae	Tamar Hindi, Imli	Fruits used as cardiac tonic and sedative. Used in stomatitis. Kernal of seeds used in sexual disorders. Stem bark used in anorexia.	C/C
50	*Terminalia chebula* (Gaertn.) Retz. SMPU, CH-8453	Combretaceae	Halela	Fruit used in constipation, expectorant, brain tonic and appetizer. Used in diarrhea, asthma and headache.	S
51	*Tinospora cordifolia* (Willd.) Miers ex Hook.f. & Thoms. - SMPU, CH-8602	Menispermaceae	Gilo	Stem used as blood purifier, anti-inflammatory, diuretic and constipation. Used in joint pain.	C
52	*Wrightia tinctoria* L. SMPU, CH-8465	Apocynaceae	Inderjo shirin	Bark and seeds used as aphrodisiac.	C

Table 1: *(Continued)*

Sl. No.	Botanical Name & Collection No.	Family	Unani Name	Uses in the Unani System of Medicine	Status
53	*Withania somnifera* Dunal SMPU, CH-8427	Solanaceae	Asgand	Root used as aphrodisiac, diuretic, rheumatism, ulcer; leaves used for painful swelling sore eye; seed used for diuretic and coagulating milk.	R

C-Common, C/C- Common & Cultivated, S-Sporadic, V-Vulnerable, R- Rare, E- Endangered

Unani Medicinal Plants used in non-communicable diseases in the study area

Fig. 4: Bijasar (*Pterocarpus marsupium* Roxb.)

Fig. 5: Sheetraj Hindi (*Plumbago zeylanica* L.)

Fig. 6: Kataikhurd (*Solanum virginianum* L.

Fig. 7: Halela (*Terminalia chebula* (Gaertn.) Retz.)

Fig. 8: Ghunghchi (*Abrus precatorius* L.)

Fig. 9: Kuchla (*Strychnonux-vomica* L.)

(*Buchanania lanzan* Spreng.), Muleem *(Gloriosa superba* L.), Gurmarbuti *(Gymnema sylvestre* R. Br.), Dipmal (*Leonotis nepetiifolia* (L.) R.Br), Kaith (*Limonia acidissima* L.), Mulsari (*Mimusops elangi* L.), Talmakhana *(Hygrophylla auriculata* (Schum.) Heine), Satawar (*Asparagus racemosus* Willd.) Sandal Safaid (*Santalum album* L.) Kuchla (*Strychnos nux-vomica* L),. Kuchla *(Strychnos potatorum* L.) and Zarawand (*Aristolochia indica* L.), are very much restricted in their distribution and such plant species are recommended for cultivation and propagation.

The medicinal plants which are available in the natural sources need to be conserved and propagated seriously because many species are under threat in different bio-geographic regions of the country due to various external factors and many of the valuable medicinal plants species are under threat to become rare, endangered and some are on the verge of extinction. To avoid the depletion of such valuable medicinal plants, the only alternative way is to develop many herbal gardens in the suitable areas for large scale cultivation of important medicinal plants through modern agronomical techniques.

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References

Alagesaboopathy, C., 2011. Ethno-medicinal plants used as medicine by the Kurumba tribals in Pennagaram Region, Dharmapuri district of Tamil Nadu, India. *Asian Journal of Exp. Biology Science* 2 (1):140-142.

Alwan, A. Maclen D.R., Riley, L.M., d'Espaignet, E., Mathers, C.D., Stevens, G.A. *et al*., 2010. Monitoring and surveillance of chronic non-communicable diseases: progress and capacity in high-burden countries. *Lancet* 376(9755): 1861-8

Anderson, G.F., Chu, E., 2007. Expending priorities: Confronting Chronic Diseases in countries with low income. *N. Engl. J. Med.* 356(3): 309-11.

Balakrishnan, V., Prema, P., Ravindran, K.C., Philip Robinson, 2009. Ethno-botanical Studies among Villagers from Dharapuram Taluk, Tamil Nadu, India. *Global Journal of Pharmacology* 3 (1): 08-14.

Gamble, J.S. & C.E.C., Fisher, 1928. Flora of the Presidency of Madras. Adlard & Son Ltd.,

Kirtikar, K.R. & Basu, B.D., 1933. Indian Medicinal Plants, Vol.1-4. Allahabad, India.

Mathew, K.M., 1983. Flora of Tamil Nadu Carnatic, Vol.1-3. Botanical survey of India, Howrah.

Nair, N.C., Henry, 1983. Flora of Tamil Nadu, Vol. 1-3. Botanical Survey of India, Coimbatore.

Sankar Murthy, K. and Kiran, B.R., 2012. Medicinal plants used as anti-diabetic drug in pharmaceutical industry and their conservation; an overview. *International Research Journal of Pharmacy* 3(10): 65-71.