Journal Homepage: - www.journalijar.com
INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)
Article DOI: 10.21474/IJAR01/4543
DOI URL: http://dx.doi.org/10.21474/IJAR01/4543
ISSN NO. 2320-5407

RESEARCH ARTICLE

THE STATUS OF SIDDHA SYSTEM OF MEDICINE (SSM) IN TAMIL NADU AND DOCUMENTATION OF SIDDHA MEDICINAL PLANTS IN ANNAMALAI HILL, THIRUVANNAMALAI, TAMIL NADU, INDIA.

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Manuscript Info

Manuscript History

Received: 20 April 2017
Final Accepted: 22 May 2017
Published: June 2017

Key words:-
Ethnobotany; Annamalai hill; Siddha; Traditional Medicine.

Abstract

This study pertains to evaluate the status of Siddha medicine in Tamil Nadu and ethnobotanical documentation of Siddha medicinal plants in Annamalai hill by collecting information from traditional Siddha healers between January 2016 and January 2017 covering all the seasons. The study revealed that Siddha medicines are preferred by the people across the state and their usage in Government hospitals has increased by 466%, since 1992. Out of 119 Indian System of Medicines manufactured by the State Government, 76 are Siddha Medicines and are supplied to 1425 Government hospitals. 47.5% of registered Siddha practitioners are traditional Siddha healers from rural areas. The indigenous knowledge about native medicinal plants in Annamalai hillsl was collected through personal interactions with traditional Siddha healers. They use 73 species of angiospermic plants, belonging to 37 families to treat various diseases. The most utilized families are Solanaceae and Malvaceae. Among the plant parts, leaves, roots, barks, flowers and fruits are the most frequently used. The local practitioners depend on the hill for their requirement of medicinal plants. Many people around the Annamalai hill still continue to prefer Siddha medicines for the treatment of common diseases, such as skin diseases, respiratory diseases, to reduce body heat, diabetes, piles, ulcers and antidotes to poisons. Ethnobotanical documentation of siddha medicinal plants provides a baseline for future phytochemical and pharmaceutical investigation.

Introduction:-

Harshberger(1896) has defined Ethnobotany as the study of the utilitarian relationship between human beings and vegetation in their environment including medicinal uses. There is significant demand for Traditional and Complementary Medicines (T&CM), practices and practitioners worldwide. In Australia, visits to complementary health professionals have been growing rapidly with an increase of over 30%, between 1995 and 2005 (www.abs.gov.au/AUSSTATS/abs). In China, the number of Traditional Chinese Medicine (TCM) visits was 18%

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of all medical visits to surveyed institutions and the number of inpatients was 16% of the total in all hospitals surveyed (Survey Report,2009). In the Lao People's Democratic Republic, each village has one or two traditional health practitioners (Lao PDR, 2012). In Saudi Arabia, individuals pay US $ 560 per annum out-of-pocket for T&CM services (AlBedh AMN et al, 2013). The WHO had formulated a strategy to promote traditional medicines called 'Strategy 2014-2023'. It supports member countries in: (i) harnessing the potential contribution of T&CM to health, wellness and people centered health care; (ii) promoting the safe and effective use of T&CM by regulating, researching and integrating T&CM products, practitioners and practice into health systems. (www.who.int/iris/bit stream). In February 2013, the Government of India, in collaboration with WHO South East Asian Regional Office (SEARO), organized an International Conference on Traditional Medicine in New Delhi in which they adopted "Delhi declaration on Traditional Medicine". (WHO-SEARO Progress Report, 2012). India has 7,85,185 registered Ayurveda, Yoga and Naturopathy, Siddha, Unani and Homeopathy practitioners and also an estimated one million village based traditional AYUSH community health workers. Annual report (2013-14) of National Medicinal Plants Board (NMPB) states that about 3000 plants species are reported to be used in the codified Indian System of Medicines (ISM) like Ayurveda (900 Species), Siddha (800 Species), Unani (700 Species) and Amchi (300 Species). Rest of the species is used in folk system of medicine.

The Siddha System of Medicine (SSM), has been prevalent since ancient times in Tamil Nadu. The system is said to have emerged from highly divine 18 Siddhars. Tirumular, a Tamil saivite, mystic and writer was considered as one of those 18 Siddhars. His main work,"Tirumandiram", (3000 stanzas) is considered as a classical text on the basic philosophy of Siddha medicine (Shunmuga Velan, 1963). Siddhars like Agasthiar, Tirumular and Bogar who lived in the 5th and 6th centuries, were able to record Siddha medicine systematically (Subbarayappa, 1997). Agasthiar had contributed more to the development of Siddha medicine and he is considered to be the "Hippocrates of Siddha medicine" (Sampath, 1983). It is also to be noted that Idaikadar , one of the 18 Siddhars lived in Thiruvannamalai and his tomb (samadhi) is situated near Gosala ,within the premises of the famous Lord Arunachaleshwarar Temple in Thiruvannamalai. The Siddhars emphasized the perfection of the body by means of yoga, alchemy, medicine and certain types of tantric religious rituals. It is mostly therapeutic in nature. In Bogar's Nikandu, 4448 diseases have been described along, with required herbal medicines (Manickavasagam, 1978). Siddha medicinal practice is taught in traditional ways either by hereditary transmission within the family from parents to children or from a master to a disciple. There are 32 types of internal medicine and 32 types of external therapy, unique to SSM. This system is effective in treating all types of skin diseases particularly psoriasis, eczema, vitiligo, hemiplegia, urinary tract infections, diseases of liver and gastro-intestinal tract, general debility, anemia, fever in addition to arthritis, allergic disorders and diseases of children (www.nischennai.org). Traditionally trained Siddha healers are still playing a major role in the health care of villages in many parts of India (Rao et al, 2011).

Traditional medicines have been playing the major role for the rural poor and act as a natural boon in the developing countries (Kaliyaperumal Karunnamoorthi et al, 2014). According to the Performance budget 2015-2016 (Health & Family Welfare), Tamil Nadu is the only state in India where the Government Medical Colleges have been established in all disciplines of Indian System of Medicine and Homeopathy (ISM&H) including Siddha. Government Siddha Colleges (2) and private Siddha Colleges(5) function in the State with an annual output of Under Graduates (370), Post Graduates (90) and Diploma (200). National institute of Siddha established at Chennai in 2015 with 200 beds provide treatment for an average of 1500 out patients per day, besides imparting Post Graduate education and research activities. [Policy Note 2016-2017, Health and Family Welfare Department]. According to Krishnan et al (2009), more skilled laborers and farmers in the state are using Siddha medicine from the beginning and employees of both the Government and private sectors have shown positive response towards the usage of Siddha medicine. Patients continue to prefer traditional Siddha medicine in the rural as well as urban areas. The traditional practitioners are called 'Naattu Vaidhiyar or Parambariya Siddha maruthuvar'. The traditional Siddha practitioners, Nattu Vaidhiyars, Parambariya Siddha maruthuvar and Sanyasis (Sadhus) collect medicinal plants from in and around Annamalai hill.

The objective of this study pertains to the evaluation of the status of Siddha medicines in the state, to indentify the Siddha medicinal plants through the local traditional Siddha practitioners around Annamalai hill and document their knowledge on Siddha medicinal plants and its usages. Conservation of Siddha medicinal plants in the hill will be initiated.

Material and Methods:-

Study Area:-

Annamalai hill also known as Arunachala and Arunai hill (12° 15` N - 79° 07` E), a part of Eastern Ghats occurs in the northern part of Tamil Nadu 185 km from the state capital Chennai (13° 04` 56`` N - 80° 16` 32`` E) covering 699 hectares of reserve forest (Fig.1). Thiruvannamalai town has a population of 1,45,278. The present study was undertaken in and around Annamalai hill. The principal occupation of the residents is agriculture. The highest altitude of the hill is 814m AMSL. The average annual rainfall of the district for the past 20 years (1997-2016) is 88.5 mm and the annual mean temperatures are: min.22.4 °C; max. 34.1 °C.

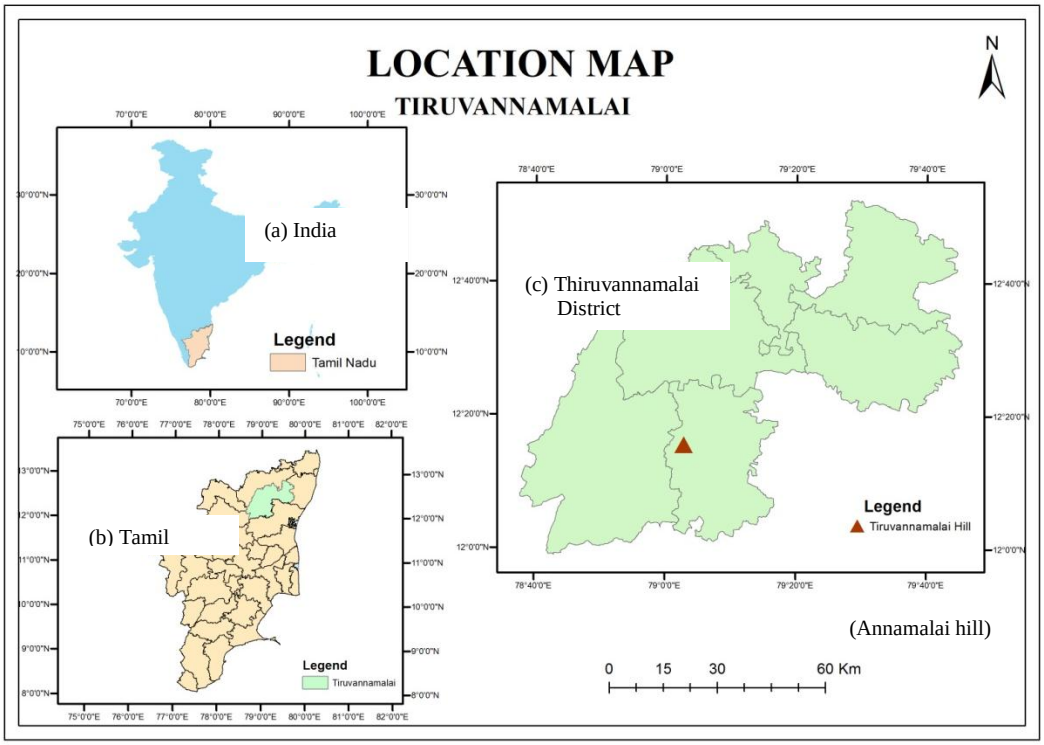


Fig.1:- Location Map: (a). India, (b). Tamil Nadu and (c). Annamalai hill.

Filed survey and Data Collection:-

The areas in Thiruvannamalai town, Adi Annamalai village, Adaiyur, Girivalam path and Annamalai Reserve Forest were visited between January 2016 to January 2017 covering all the five seasons of the year viz., spring (mid - April to mid - June) summer (mid - June to mid - August), rainy (mid - August to mid - October) autumn (mid - October to mid - December) and winter (mid - December to mid - April). Inventory interview (Silva et al. 2014) method was adopted for recording the species and their uses, as it allowed more plants to be identified in their original environment. The information on medicinal uses of indigenous Siddha medicinal plants were gathered from aged rural folk, traditional Siddha medicine practitioners, Sadhus (Sanyasis) and sellers of herbal medicines around the hill. All these people were taken to the study area to identify the plants and their uses. Specimens were collected, indentified and systematic enumeration was made with the help of "The Flora of Presidency of Madras" by Gamble, 1918, "The flora of Tamil Nadu Carnatic" by Mathew, 1983. Flora of Tamil Nadu by N.C. Nair and A.N. Henry and "Plant Resources of Tiruvannamalai District" by R. Vijaya sankar, K. Ravikumar and P. Ravichandran. Voucher specimens were made and deposited to the Gill Research Institute, Gurunanak College, Chennai. All the botanical names are given in the alphabetical orders of the family. The plants collected are tabulated according to their family, binomial, common name (Tamil), habit, parts utilized and medicinal uses.

Results and Discussions:-

Status of SSM in Tamil Nadu:-

The Siddha System of Medicine (SSM) practiced in the state since ancient period still continues to grow among the people from all walks of life. In 2016, out of 3,44,20,602 patients who were treated by Indian Systems of Medicine

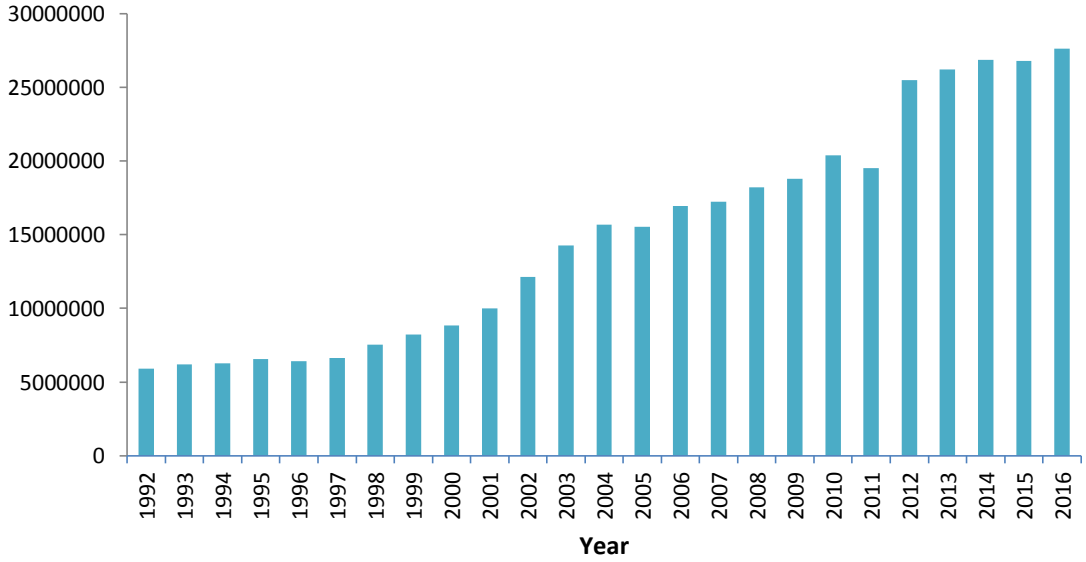
(ISM) at various Government hospitals in the state, 2,76,15,754 patients (80%) have taken Siddha medicines. Likewise the numbers of patients treated in Siddha medicine have been increasing dramatically, since 1992. In 1992, about 59,18,773 patients were treated under SSM and the number had increased to 2,76,15,754 in 2016, with 466% increase since 1992. There are 9,933 registered Siddha practitioners in the state (as on December 2016), out of which, 47.5% (n=4720) practitioners are traditional Siddha practitioners from rural areas and the remaining 52.5% (n=5213) are graduates and diploma holders. This study reveals that nearly half of the Siddha practitioners are traditional healers. B and C category of Siddha practitioners have been registered based on their experience. Siddha practitioners with more than 5 years of practice before 1 October 1971 are registered as enlistment practitioners (Table.1). To ameliorate the socio economic conditions of traditional Siddha practitioners above 60 years of age, who were not able to continue their practice, the Government of Tamil Nadu provides old age pension to them, since 1986. Out of 110 aged hereditary Siddha practitioners from 13 Districts receiving old age pension, 19 are from Thiruvannamalai District.

Table.1;- List of registered and traditional Siddha practitioners in Tamil Nadu (as on December 2016)

Sl.No.	Class	No. of registered practitioners
1.	Bharat Siddha Medicine Science (B.S.M.S)	5178
2.	Bharat Siddha Medicine (B.S.M) and Certificate in Siddha Medicine Practitioners (C.S.P)	26
3.	Graduate of the college of Integrated Medicine	3
4.	Licentiate of Integrated Medicine (LIM)	5
5.	Licentiate of Ayurvedic Medicine (LAMS)	1
6.	B- Class	2,258
7.	C-Class	29
8.	Enlistment Practitioners	2,433
	Total	9,933

Source: Tamil Nadu Siddha medical council.

Fig .2:- Details of patients treated under the Siddha System of Medicine (SSM) in various Government hospitals in Tamil Nadu from 1992 to 2016.



Source: Performance Budget 2015-2016, Health & Family Welfare Department, Tamil Nadu.

Awareness on the importance of consumption of Nilavembu decoction among the general public has been increased to prevent dengue fever, arthritis and body pains. This is prepared from nine herbals viz., Andrographis paniculata, Vetivera zizanoides, Plectranthus amboinicus, Trichosanthes cucumernica, Santalum album, Cyperus rotundus, Zingiber officinale, Piper nigrum and Mollugo cerviana. The Siddha wing of the Government hospitals distributed 1,66,251 Kg of Nilavembu decoction powder during flood relief works in Chennai from September 2015 to December 2015 to prevent dengue and other viral fevers. Similarly 3,87,965 people were benefitted by taking Nilavembu decoction at Vardha cyclone relief camps functioned between 18.12.2016 and 22.12.2016 in Chennai, Kancheepuram and Thiruvallur Districts. Tamil Nadu Medicinal Plant Farms and Herbal Medicine Corporation Limited (TAMPCOL), a public sector undertaking, manufactures 119 Indian Systems of Medicines (ISM), in which 76 are Siddha medicines and the same, are being distributed to 1425 Government hospitals. It clearly indicates that the people continue to prefer Siddha medicine not only from traditional Siddha healers but also from the Government hospitals.(Table.2). Steadily increasing the usage of Siddha medicines in Government hospitals since 1992, manufacture of 65.51% (n=76) Siddha medicines by TAMPCOL, existence of 47.5% of traditional healers in rural areas and preference of public for Nilavembu decoction during flood and cyclone relief activities in Chennai City (2015 and 2016) and adjoining districts clearly depicts that the demand for Siddha Medicines still exists.

Ethnobotanical Documentation:-

Ethnobotanical survey revealed that the traditional Siddha practitioners residing around Annamalai hill, girivalam path, Adi-Annamalai and Thiruvannamalai town, use 73 plant species belonging to 37 families, as Siddha medicine. The specific medicinal uses of all the 73 Siddha plants with their binomial, family name, common name (Tamil), habit and parts used were recorded in the study area, tabulated and given in Table.2.

Table 2:- List of medicinal plants used by the traditional Siddha practitioners around Annamalai hill with family name, binomial, common name, habit, parts used and medicinal uses.

Sl. No.	Family Name	Binomial	Common Name (Tamil)	Habit	Parts used	Medicinal uses
1.	Acanthaceae	*Andrographis paniculata* Nees.	Siriyaanangai, Nilavembu	Herb	All parts	Decoction of entire plant is consumed to prevent dengue and viral fevers. Leaf paste is applied on the site of snake bite and scorpion sting. Powdered dry leaves are consumed with milk to treat diabetes.
2.	Acanthaceae	*Justicia procumbens L.*	Kodagasaalai	Herb	All parts	Leaf paste is used as laxative, diuretic, expectorant, and cures asthma, cough and rheumatism.
3.	Acanthaceae	*Justicia adhatoda L.*	Aduthoda	Shrub	Leaves	Leaves are used to treat fever, cold, cough and bronchitis .It regulates respiration.
4.	Aloaceae	*Aloe vera (L.)* Burm.f.	Sothu kathaazhai	Herb	Leaves	After removing the green tissues from the leaves, the gel is consumed with butter milk to treat stomach ulcers, colon cancer and piles. It reduces body heat and cures skin diseases. Smearing of gel quickly heals fresh wounds.
5.	Amarantaceae	*Achyranthes aspera* L.	Naayuruvi	Herb	All parts	Juice of entire plant is used to treat scorpion sting and snake bite. Leaf and root paste is applied to cure cuts and wounds. Consumption of leaf paste mixed with ginger oil and jaggery will cure rabies.
6.	Amarantaceae	*Amaranthus spinosus* L.	Mullu keerai	Herb	Leaves, stem	Paste of leaves and tender stems are consumed with milk, honey and white petals of lotus flowers to reduce body heat. Also used as antidote for snake

						bite and as laxative.
7.	Amarant haceae	*Aerva lanata (L.)* A.Juss.	Sirupeelai	Herb	Leaves	Leaf paste is consumed to treat cough and throat infections.
8.	Apiaceae	*Centella asiatica (*L.*)* Urban	Vallaari	Herb	Leaves	Dried and powdered leaves are taken with milk, honey and white petals of lotus flowers to improve receptive and memory power and also used for treatment of leprosy. Leaves are cooked and eaten. It treats skin diseases, neuro problems and purifies blood.
9.	Apocyna ceae	*Nerium oleander* L.	Sevvarali	Shrub	Leaves, bark, flowers	Leaves and flowers are used to treat skin eruptions and to destroy maggots infesting wounds. Juice prepared from stem bark relieves ear pain.
10.	Apocyna ceae	*Thevetia peruviana (Pers.)* Schum.	*Thiruvachi poo*	Shrub	Leaves, root, bark,	Paste of leaves, roots and barks cure edema and tumors. Leaves are used as laxative and also to stimulate vomiting. It reduces fever and keeps body cooling.
11.	Apocyna ceae	*Wrightia tinctoria* R.Br.	Veppaalai	Tree	Leaves, bark, seeds	Juice of tender leaves is used to cure jaundice, tooth ache and its bark is tonic. Juice extracted from seeds is taken to treat indigestion.
12.	Apocyna ceae	*Ervatamia coronaria (Jacq.)* Stapf.	Nandhia vattam	Shrub	Flowers , latex	Fresh petals are washed in freshwater and tied on the eyes before sleep. It cures eye infections. Latex and juice obtained from the plant applied on wounds for quick healing and also cures skin diseases.
13.	Asclepia daceae	*Calotropis gigantea* (L.) R.Br.	Erukku	Shrub	Leave latex.	Latex is used as a purgative. Powdered leaves are used to treat indigestion, asthma and cough.
14.	Asclepia daceae	*Hemidesmus indicus* (L.) R.Br.	Nannari	Twinine r	Leaves, roots	Powdered leaves and roots are taken orally to reduce body heat. Roots are eaten raw to cure piles. Leaf paste improves virility among men and remedies for infertility among women.
15.	Asparaga ceae	*Asparagus racemosus Willd.*	Thanneer vittan kizhanghu	Shrub	Leaves, Root	Leaf and root paste cures infections in uterus, menstrual problems and also an antidysentric.
16.	Asterace ae	*Eclipta prostrata L.*	Vellai Karisalaan kanni	Herb	Leaves, latex, stem.	Leaves, latex and tender stems are mixed with *Phyllanthus amarus* and the paste is consumed with butter milk in empty stomach to treat jaundice. Leaf powder is mixed with coconut oil and applied on hair for black hair.
17.	Asterace ae	*Sphaeranthus indicus* L.	Koottaikka ranthai	Herb	Leaves, Flowers , Seeds.	Leaves, flowers and seeds are made into paste to treat skin diseases, bronchitis and piles.
18.	Asterace ae	*Tridax procumbens* L.	Vettugayap oondu	Herb	Leaves	Leaf paste is applied on fresh cuts and wounds.
19.	Burserac eae	*Commiphora caudata (Wight & Arn.)*	Pachai kiluvai	Tree	Bark, resins.	The resin of the stem is applied on the fissures of feet to relieve pain. The paste made from green bark is boiled

		Engl.				with castor oil and smeared over the body to relieve body pains.
20.	Caesalpiniaceae	*Bauhinia variegata* L.	Mandhaarai	Tree	Leaves, roots, bark.	Leaves are antidote to poison. Roots and bark are used to cool body, astringent and they cure ulcers, swellings, leprosy, cough, menstrual disorders, dysentery and piles. It is also anthelminthic.
21.	Caesalpiniaceae	*Cassia auriculata* L.	Aavarai	Shrub	Leaves, stem, bark, Flowers.	Powdered leaves and flowers are consumed to treat chronic diabetes and liver infections. Tender stems are used as tooth brush. The bark and flowers are mixed with poppy seeds *(Papaver somniferum)*, black pepper *(Piper nigrum)*, white mustard *(Brassica nigra)*, *Hemidesmus indicus*, flower buds of banana *(Muca paradisiaca)* and *Ficus glomerata* consumed to prevent hemorrhage during menopause and vaginal infections.
22.	Caesalpiniaceae	*Cassia fistula* L.	Sarakkondrai	Tree	Leaves, bark, flowers	Leaves and bark are purgative and laxative. It cures skin diseases. Dried flowers are consumed for cooling the body.
23.	Capparaceae	*Capparis sepiaria L.*	Thoratti	Climbing Shrub	Laves, bark	Leaf juice is taken for treatment of gonorrhea. The powdered bark mixed with garlic, pepper and Palmgur is taken to treat rheumatism and viral fevers.
24.	Cleomaceae	*Gynandropsis gynandra (*L.*)* Briq.	Nalla velai	Herb	Leaves, roots, seeds.	Dried and powered leaves, roots and seeds are used to treat scorpion sting and snake bites and cancer. Roots are used for fever, skin diseases, rheumatism, muscular pain and head ache.
25.	Colchicaceae	*Gloriosa superbai* L.	Kalappai kizhangu	Herb	Tuberous roots	Tubers cure leprosy, piles and chronic ulcers. It also cures stomach ache.
26.	Combretaceae	*Terminalia bellirica (Gaertn.)* Roxb.	Thaandrikkai	Tree	Fruits	The fruit husk is powdered and consumed to treat cough and reduce body heat. It also treats diarrhea.
27.	Combretaceae	*Terminalia arjuna (Roxb.*ex DC*)*	Marudamaram	Tree	Bark Fruits	Bark is used to treat diabetes and to reduce blood pressure. Fruit paste heals cuts and wounds.
28.	Combretaceae	*Terminalia chebula* Retz.	Kadukkai	Tree	Fruits	Fruit husk is dried and made as powder. It is consumed with warm water or milk and it cures constipation, peptic ulcers, gastric problems and piles. Also acts as body tonic.
29.	Convolvulaceae	*Evolvulus alsinoides (L.)* L.	Vishnukiranthi	Herb	All parts	Powered plant parts are used to treat internal hemorrhage. Whole plant paste is taken to cure fever and also as anthelmintic.
30.	Convolvulaceae	*Ipomoea hederacea (L.)*	kakkattan	Climbers	Leaves, Seeds	Powder of leaves and seeds are anthelmintic, purgative, purifies blood,

		Jacq.				laxative and carminative. It cures fevers.
31.	Cucurbitaceae	*Coccinia grandis (*L.*)* Voigt.	Kovai	Climbers	Leaves, root, fruit	Leaf, root and fruit juice is used for treating skin diseases and ear infections.
32.	Cucurbitaceae	*Momordica charantia (*L.*).*	Paagarkai	Climber	Root, fruits	Cooked ripe fruit is medicine for diabetes. Root is used to treat prolapsed vagina and hemorrhoids.
33.	Cyperaceae	*Cyperus rotundus* L.	Korai kizhangu	Herb	Tuber	Boiled tubers are used to cure indigestion and diarrhea.
34.	Erythroxylaceae	*Erythroxylum monogynum Roxb.*	Sembulichchan	Shrub	Leaves, barks	Leaves are used as a refrigerant and bitter tonic. Wood and bark cures stomach ache and kidney diseases. Young leaves are taken fresh to treat heart diseases.
35.	Euphorbiaceae	*Acalypha indica* L.	Kuppaimeni	Herb	Leaves, roots	Leaf and root paste is applied externally to treat eczema. It also cures kidney diseases and bronchitis.
36.	Euphorbiaceae	*Euphorbia hirta* L.	Amman pacharisi	Herb	Latex	Latex is applied on lips to cure lip cracks and also cures skin diseases.
37.	Euphorbiaceae	*Phyllanthus amarus Schum & Thonn.*	Keezha nelli	Herb	All parts	Entire plant with seeds of *Cuminum cyminum (*cumin) and leaves of *Eclipta prostrata* are mixed, made into paste and taken internally to cure hepatitis. Treats urinary tract infections, fever and dysentery. It is also anthelmintic.
38.	Fabaceae	*Abrus precatorius* L.	Kundumani	Climber	Roots, seeds.	Roots are taken orally with cow's milk to treat snake bite and the dry powder of seeds is consumed to treat scorpion sting.
39.	Fabaceae	*Clitoria ternatea* L.	Sangu poo	Twiner	Root	Root powder is taken with water to treat indigestion, kidney diseases and headache
40.	Fabaceae	*Pongamia pinnata* (L.) Pierre.	Pungam	Tree	Leaves, root, flowers, seed oil.	Decoctions of dried flowers are used to treat diabetes. Leaf and root juices are taken to cure gonorrhea. Leaf juice is taken to cure dyspepsia, diarrhea, cough and leprosy. Seed oil is anthelmintic and cures skin diseases.
41.	Lamiaceae	*Leucas aspera (Willd.)* Link	Thumbai	Herb	Leaves, Flowers	Leaf paste is applied externally to treat skin diseases. Flowers are taken to reduce body heat and fever. Leaves are boiled and its vapor is inhaled to cure headache. Flowers are mixed in boiled gingelly oil and applied on skin to reduce body heat.
42.	Lamiaceae	*Ocimum gratissimum* L.	Perunthulasi	Shrub	Leaves seeds	Fresh leaves are used to treat stomach ache, cough, asthma and bronchitis. Leaf juice is used for treating nasal infections and prevent foul breath. It is anthelmintic. Seeds are crushed and given internally to treat piles and sinusitis.
43.	Lamiaceae	*Ocimum sanctum L.*	Thulasi	Herb	Leaves, seeds	Leaves and seeds are crushed with onions and the juice is taken orally to

		Mant.				treat cough, asthma, bronchitis and headache.
44.	Lamiaceae	*Coleus aromaticus Benth.*	Karpura valli	Herb	Leaves	Juice obtained from hot leaves, mixed with honey and given to treat cough, cold and bronchitis to children.
45.	Lythraceae	*Lawsonia inermis Linn.*	Maruthaani	Shrub	Leaves, bark, flowers	Leaf paste mixed with turmeric is an expectorant, prevent burning sensation of skin and cure leucoderma. Bark is sedative, cures jaundice, spleen diseases and leprosy. Flowers cure sleeplessness.
46.	Malvaceae	*Abutilon indicum (L.)* Sweet.	Thuththi	Sub shrub	Leaves, root bark.	Leaves are used as demulcent, tonic and also used to treat rheumatism. The bark is used to treat infections in urinary tract and gonorrhea. Leaf and root juice is taken to cure dental infections and tooth ache.
47.	Malvaceae	*Hibiscus rosasinensis* L.	Semparuthi	Shrub	Flowers	Decoction of flowers mixed with coconut oil used to apply on head to prevent hair fall. It kills head lice. They are fried with ghee and taken for menorrhagia. Flowers are ground with leaves of *Justicia adhatoda* and consumed to treat asthma and gonorrhea. Petals mixed with cow's milk and Palmgur are consumed to reduce blood pressure.
48.	Malvaceae	*Sida coridifolia* L.	Nilathuththi	Under shrub	All parts	Decoction of the leaves cure kidney infections. Juice of the plant is given to treat rheumatism, elephantiasis and paralysis.
49.	Malvaceae	*Thespesia populnea* (L.) Sol. ex Corr.	Poovarasu	Tree	Leaves, roots, flowers.	Powered leaves, flowers and roots reduce body heat, cures ulcers, itching scabies, hemorrhoids and urinary disorders. Root is tonic and cures joint pains.
50.	Malvaceae	*Waltheria indica L.*	Sergalipoondu	Sub shrub	All parts	Decoction of the aerial parts is used for healing wounds. Leaf powder is used for cough.
51.	Meliaceae	*Azadirachta indica A.* Juss.	Vembu	Tree	Leaves, Flowers, bark, seed .oil	Leaf paste and decoction of bark are used as medicine to treat skin diseases. It also purifies blood and cure boils. Decoction of dry flowers is used as tonic and cures stomach ache. Seed oil cures leprosy
52.	Mimosaceae	*Mimosa pudica* L.	Thottasinungi	Herb	Leaves, stem.	Leaf paste is applied on cuts and wounds for quick healing. Leaves and stems are crushed and made into paste and it is used to treat scorpion sting.
53.	Moraceae	*Ficus bengalesis* L.	Aalamaram	Tree	Roots, fruits, latex	Latex is applied externally to treat skin diseases and heal cracks. Fruits are used for cooling the body. Prop roots treat tooth infections.
54.	Moraceae	*Ficus religiosa* L.	Arasu	Tree	Bark, fruit, seeds,	Bark and latex cure mouth sores, atrophy, emaciation, rheumatism and small pox. Fruit is used as mild

					latex	laxative. Seeds are taken by women to treat menstrual problems.
55.	Moraceae	*Ficus glomerata Roxb.*	Aththi	Tree	Fruit, bark, roots.	Decoction of dried bark cures ulcers and controls over bleeding during menstruation. Fruit treats anemia. Juice obtained from root cures ulcer.
56.	Myrtaceae	*Eucalyptus globulu Labill.*	Eucalyptus	Tree	Leaves, oil.	Oil extracted from the leaves are used as antiseptic in skin diseases and internally consumed as an expectorant to treat bronchitis. Decoction of leaves is used as repellent of insects. Leaves are febrifuge. Inhalation of fumes from leaves prevent respiratory diseases.
57.	Ncytaginaceae	*Boerhavia diffusa* L.	Mookkarattai	Herb	All parts	Entire plant is cooked and taken along with food. It is used as laxative. It cures asthma, anemia, jaundice and antidote for snake bites. Leaf paste is applied on testicles to treat hydrocele. Root mixed with cow's milk relieves body pain.
58.	Oleaceae	*Jasminum grandiflorum L.*	Jaadhi	Malli	All parts	Paste of entire plant treats chronic ulcers, cancer and skin diseases. It also cures ulceration in mouth, headache and improves vision.
59.	Papaveraceae	*Argemone mexicana L.*	Nai kadugu	Herb	Roots, seeds	Root is used to treat chronic skin diseases, piles and stomach ache. Seeds are laxative and anthelmintic.
60.	Poaceae	*Cymbopogon citratus (DC.)* Stapf.	Elumichampul	Herb	Stem, leaves, fruit, oil	Stimulant, diaphoretic, anti-spasmodic, oil is carminative, treats cholera and elephantiasis. Leaf juice treats headache.
61.	Poaceae	*Cynodon dactylon (L.)* Pers.	Arugampul	Herb	All parts	Consumption of fresh juice of the grass treats diabetes, purifies blood, constipation and also cleans alimentary canal. Decoction of whole plant keeps body cool.
62.	Rhamnaceae	*Ziziphus mauritiana Lam.*	Ilanthai	Tree	Leaves, bark, roots, fruit	Root is bitter and used for body cooling. It cures fever, old wounds and ulcers. Taking bath in water mixed with decoction of bark and leaves relieve body pain. Consumption of ripen fruits cure peptic ulcer.
63.	Rutaceae	*Toddalia asiatica L.* Lam.	Milagaranai	Shrub	Root, bark.	Root and bark is bitter and tonic. Leaves are used as stimulation tonic.
64.	Rutaceae	*Aegle marmelos (L)* Correa.	Vilvam	Tree	Leaves, fruits	The leaves and fruits are consumed to treat diabetes. It also reduces fever and blood pressure.
65.	Sapindaceae	*Cardiospermum halicacabum L.*	Mudakathaan	Climber	Leaves	Tender leaves are cooked and taken with food to treat joint pains (arthritis) and body pains. It is given to aged, chronic arthritis patients.
66.	Solanaceae	*Solanum trilobatum L.*	Thoodhuvalai	Herb	Leaves, fruits	Leaves and unripe fruits are prepared as curry and consumed. It treats cough, bronchitis, itching and indigestion.
67.	Solanace	*Solanum*	Manathaka	Herb	Leaves,	Leaves, tender stem, flowers and fruits

	ae	*nigrum L.*	ali		Flowers, Fruits	cure ulcers, indigestion and also used as laxative.
68.	Solanaceae	*Solanum xanthocarpum Schrad & Wendl.*	Kandangathiri	Herb	Fruits	Ripe fruits are consumed to cure digestive disorders, relieve dental pain, cough and bronchitis.
69.	Solanaceae	*Solanum trilobatum L.*	Thoothuvelai	Herb	Leaves	Leaves are cooked after removing thorns and are taken to treat cold, cough and chronic bronchitis.
70.	Solanaceae	*Datura metel L.*	Karu oomaththai	Sub shrub	Leaves, seeds	Dried leaves and seeds are used to improve digestion and cure skin diseases. Leaf juice is used to treat ear ache.
71.	Verbenaceae	*Lippia nodiflora* (L.) Rich.	Poduthalai	Herb	All parts	Plant paste is consumed to treat infections in the alimentary canal and digestive disorders. Decoction of entire plant is consumed to treat peptic ulcers.
72.	Verbenaceae	*Vitex negundo L.*	Oodha nochi	Shrub	Leaves	Leaf paste is used to cure cough, asthma, fever, ulcers, skin diseases and nervous disorders. Leave are boiled in water and the vapor is inhaled to cure head ache, cold and cough.
73.	Vitaceae	*Cissus quadrangularis L.*	Pirandai	Shrub	Leaves, stem.	Green twigs cooked with cumin and pepper by removing nodes and skin is consumed to cure cough, dyspepsia and ulcers. It is also used to treat scurvy, intestinal disorders, piles and irregular menstruation.

Regarding the habits, 30 species belong to herb (42%), 18 species to shrub (25%), 16 species and 8 species belong to tree (22%) and twiners / climbers (11%) respectively (Fig.3). Investigation also revealed that among the 37 families, the most utilized plant families are Solanaceae and Malvaceae represented by five species each, followed by Lamiaceae and Apocynaceae represented by four species each and three species each in Acanthaceae, Amaranthaceae, Asteraceae, Asclepiadaceae, Combretaceae, Euphorbiaceae, Fabaceae and Moraceae. Six families have each two species and each one species in 19 families (Fig.4). Of the 37 total families, only four families viz., Aloaceae, Colchicaceae, Cyperaceae and Poaceae belong to monocotyledons, whereas 33 families belong to the dicotyledons. Among the plant parts, the most utilized parts are leaves, followed by roots, barks, flowers, seeds, stem, latex, oil and resins (Fig.5). While analyzing the various plants which are used to cure diseases, 21 plants are used to relieve pain, 19 plants for treating skin diseases, 19 plants for respiratory diseases and 12 plants for reducing body heat (Fig.6). The study also revealed that many people in the study area still depend on Siddha medicinal plants for the treatment of common diseases such as skin diseases, respiratory diseases, diabetes, piles, ulcers and indigestion. Six plants are used to treat leprosy and 4 plants for curing cancer.

Fig. 3:- Habit forms of Siddha medicinal plants.

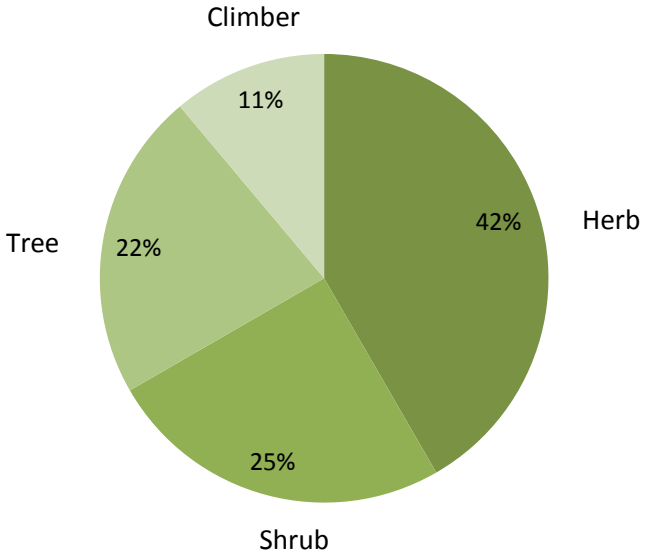


Fig. 4:- Percentage of collected plant species among different families.

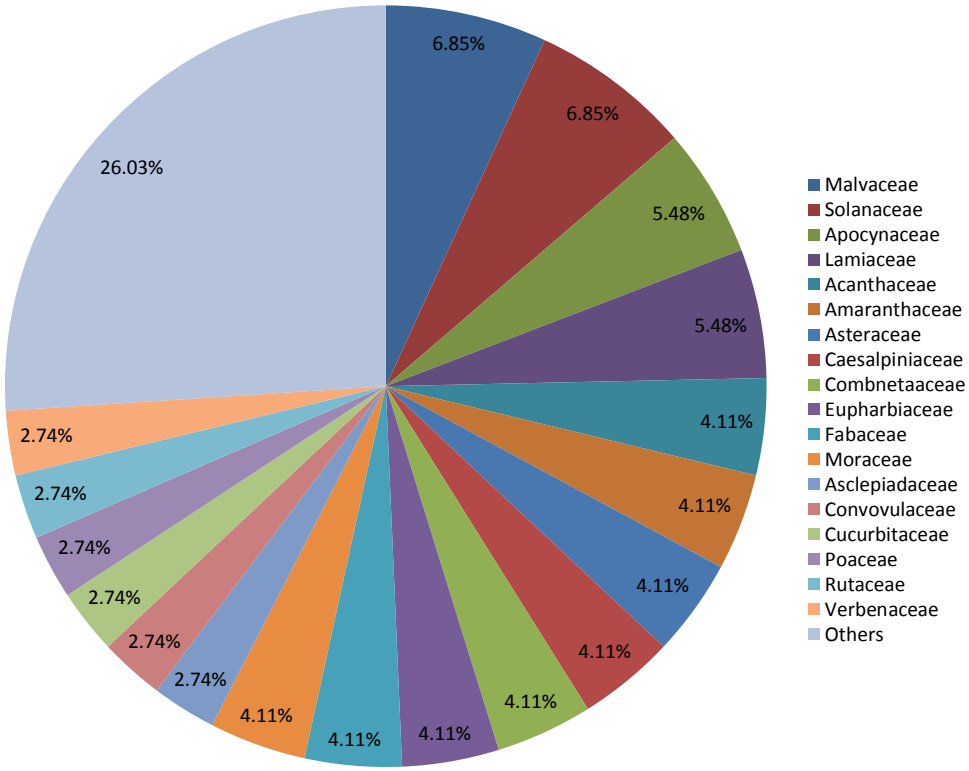
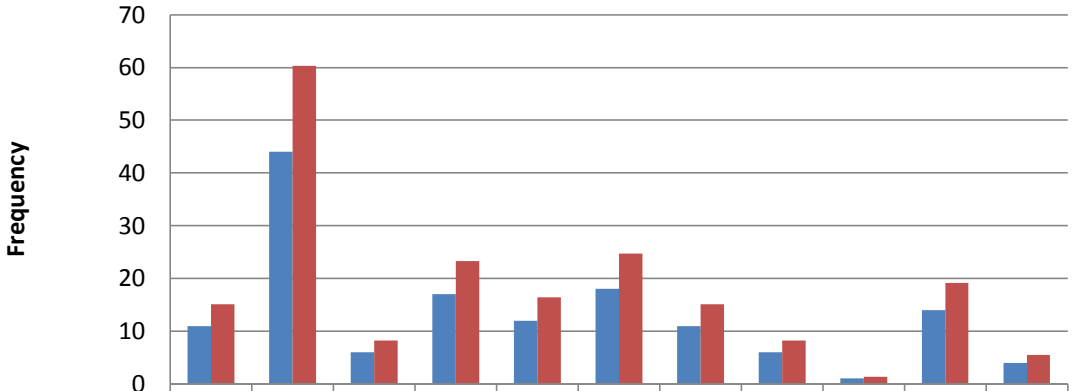
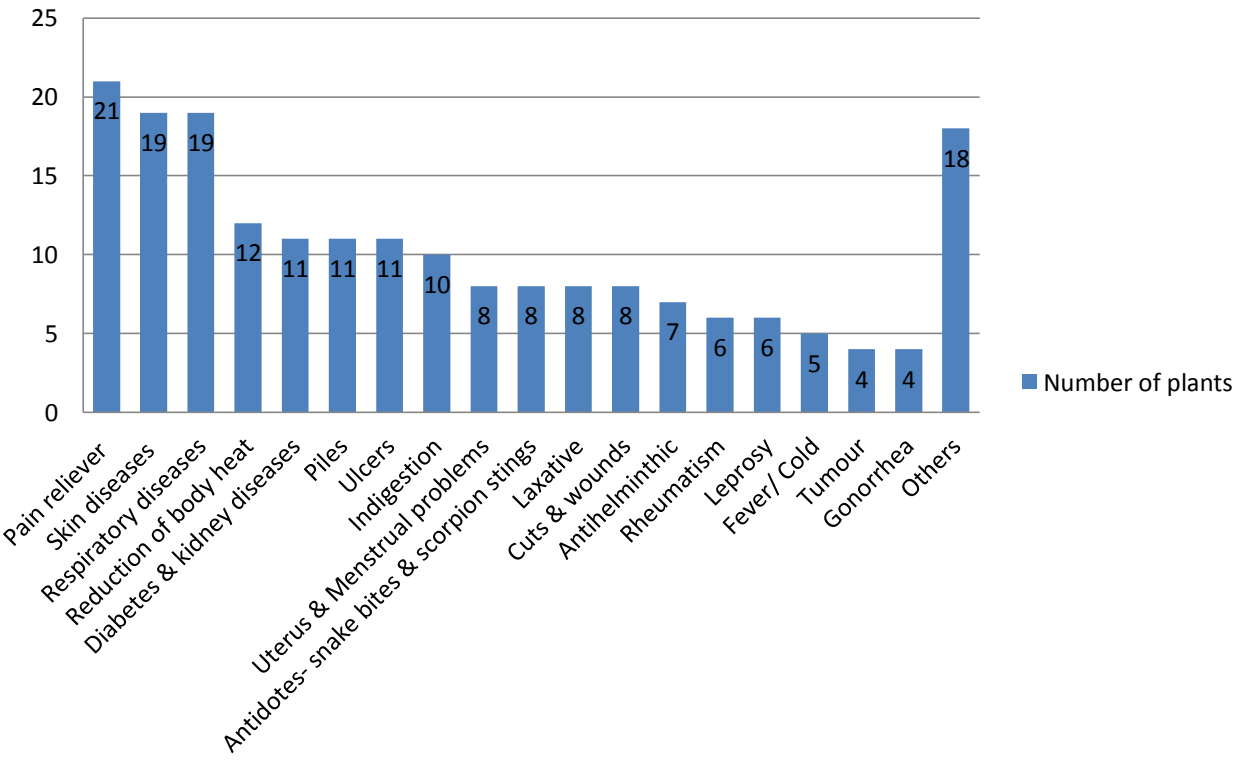


Fig -5 Frequency of plant parts used as Siddha medicine



	All parts	Leaves	Stem	Bark	Flower	Root	Seed	Latex	Resin	Fruit	Oil
Numbers	11	44	6	17	12	18	11	6	1	14	4
Percentage	15.06	60.27	8.21	23.29	16.44	24.66	15.06	8.21	1.36	19.18	5.48

Fig.6.Details of Siddha medicinal plants used in curing diseases



Conclusion:-

The use of Siddha medicines in various Government hospitals in Tamil Nadu has increased by 466% since 1992. 47.5% of registered Siddha practitioners are traditional healers from rural areas. Out of 119 ISM manufactured by the State Government, 76 are Siddha Medicines. General public preferring Nilavembu decoction during flood (2015) and Vardha cyclone (2016) relief works in Chennai clearly indicates that the patients still prefer Siddha Medicines. The Siddha practitioners who were unable to continue practices due to old age receive monthly pension from state government. This study revealed that the Annamalai hill has rich resource of medicinal plants which are used to treat wide spectrum of human ailments. 73 plants belonging to 37 families are being collected around Annamalai hill by the traditional healers, as Siddha medicine. Leaves, roots, barks, flowers and fruits are the most frequently used plant parts. Many people in the study area still depend on medicinal plants for the treatment of skin and respiratory diseases, reduction of body heat, curing of diabetes, piles and ulcers and antidotes for snake bites and scorpion stings. Although traditional SSM is still practiced in this area, it is now fast disappearing due to modern life style. This traditional knowledge on the indigenous uses of the Siddha medicinal plants and its documentation could boost new innovation in the pharmaceutical industry and have many beneficial applications. Hence, proper documentation and preservation of traditional skill of SSM is a vital necessity.

Acknowledgements:-

The authors are thankful to the traditional healers for providing medicinal information; P. Poornima IFS., Assistant Conservator of Forest, Koraput division, Odisha for constant encouragement and providing guidance; Annadurai, C. Raja and K. Arunpandian of Thiruvannamalai for assisting in collection of data; Sudha Ramen IFS., District forest Officer and G. Udhyakumar, ACF, Thiruvannamalai for granting permission to undertake study in the forest area.

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