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Ethnobotanical study of medicinal plants used by traditional users in Villupuram district of Tamil Nadu, India

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The study of ethno botanical was carried out along with the ethnic groups (Villupuram district) in the South Western Ghats of India. In the present study, 46 plant species belonging to 31 families were included. In this assertion, the information collected from the traditional healers was used to compare with the already accessible literature on the ethnobotany of India. The conventional ethno medicinal plants were mostly used for fever, dysentery, skin diseases, poison bites, wounds, piles and rheumatism. The medicinal plants used by traditional users of Villupuram district are arranged alphabetically followed by botanical name, family name, local name and major chemical constituents, parts used, mode of preparation and medicinal uses.

Key words: Medicinal plants, traditional healers, chemical constituents.

INTRODUCTION

Among the Angiospermic plants, 420,000 flowering plants were reported from the world (Govaerts, 2001) and many tropical species are not yet named. More than 50,000 plants have been used for medicinal purposes (Schippmann et al., 2002). India is represented by rich culture, traditions, and natural biodiversity, and offer unique opportunity for the drug discovery researchers. Utilization of plants for medicinal purposes in India has been documented in ancient literature (Samvat; Charak, Drdhabala, 1996). India is blessed with two (Eastern Himalayas and Western Ghats) of the eighteen worlds'

hotspots of plant biodiversity and is seventh among the sixteen Mega diverse countries, where 70% of the world's species occur collectively. In India, there are over 17,500 species of higher plants, 64 gymnosperms, 1,200 pteridophytes, 2,850 bryophytes, 2,021 lichens, 15,500 fungi and 6,500 algae are reported. India is rich in its own flora that is, endemic plant species (5,725 angiosperms, 10 gymnosperms, 193 pteridophytes, 678 bryophytes, 260 liverworts, 466 lichens, 3,500 fungi and 1,924 algae) (Sanjappa, 2005). In India, the main traditional systems of medicine include Ayurveda, Unani and Siddha use over 7,500 plant species have been reported. Traditional healers provide considerable information about the use of many plants or plant parts as medicine. The World Health Organization (2003) has estimated that 80% population of the developing countries is unable to afford pharmaceutical drugs and rely on traditional herbal

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medicines, to sustain their primary health care needs. India is one of diverse countries in the world, rich in medicinal herbs and plants. In Indian traditional system of medicine, herbal medicines have been used primordially. Over the last century, ethno botany has evolved into a specific discipline that looks at the people–plant relationship in a multidisciplinary manner, such as ecology, economic botany, pharmacology and public health (Balick, 1996). Herbal medicines are assumed to be of great importance in the primary healthcare of individuals (Sheldon et al., 1997) and communities in many developing countries as the herbal medicines are comparatively safer than synthetic drugs. Plant-based traditional knowledge has become a recognized tool in search for new sources of drugs and nutraceuticals (Ghosh, 2003; Sharma and Mujundar, 2003). In this present research article, we report on the information collected from traditional practitioners to cure various diseases in Villupuram district of Tamil Nadu, India.

STUDY AREA

Villupuram district is situated in the South-Eastern portion of the state of Tamilnadu, India. The district lies between 11° 59' and 12° 48' North latitude and 78° 60' and 79° to 80° East longitude and extending over an area of 8,204.63 sq.km. It is bounded on the North by Thiruvannamalai and Kanchipuram districts, on the East by the Bay of Bengal, on the South by the district of Cuddalore and on the West by Salem and a part of Dharmapuri district. There are 29 forest areas under legal classification including 25,185.58 hectares area in green cover. 25 areas fall under the reserve forest category with 24,753.24 hectares, 4 areas under reserve land category with 370.01 hectares and 62.33 hectares area under unclassified forests. The reserve forest category has rich soil and bright sunlight, and important natural resources which are abundantly available in this region and responsible for the development of rich vegetation having variable medicinal properties.

METHODOLOGY

Survey

In order to assess the consumption of indigenous medicinal plants, survey was carried out during the year, 2008 in the forest areas of Villupuram district in Tamilnadu, India. To get maximum information the survey was widened diagonally during the rainy season. The information on medicinal uses of the indigenous plants has been described after gathering it from local people, experienced aged rural folk, traditional herbal medicine practitioners, local herbal drug sellers and the information collected from the available literature. A total of 275 inhabitants were interviewed. Randomly people were selected of which 160 men and 115 women of age 25 and above ($x = 57.92$) were interviewed in their local language, that is, Tamil. In addition, direct plant observation and identification was done with the help of local healers known as 'Maruthuvar'. A structured

feedback form was used to draw information from the resource persons using standard methods (Martin, 1995). Information on medicinal plants, local name, plant parts used and mode of administration for curing diseases has been recorded. Plants collected during the surveys were identified with the help of published regional flora (Gamble, 1935; Matthew, 1983). The identified plant specimens were then confirmed with the herbaria of botanical SURVEY of India (BSI), Southern circle, Coimbatore, India. The specimens were deposited in the Herbarium, Department of Botany, Presidency College, Chennai 600 005. Voucher specimen numbers along with other details are given in (Table 1) and the collected data contains the list of plants of different families with their traditional uses, plant parts used and their mode of administration which are listed in alphabetical order (Table 1).

Views of local people

Information obtained from medicinally important plants was assessed by calculating the proportion of plants cited and utilized in relation to the total number of interviewees.

Categorization of medicinally important plants

Traditionally important medicinal plants which are cultivated, as well as grown in the wild were classified into different types of habits and forms such as trees, herbs, shrubs, climbers, etc.

Biodiversity of medicinally important plant species

Medicinally important plant species were found to be in plenty in each sampling unit when surveyed. Depending upon the number, they were then divided into four arbitrary groups namely, rare, common, fairly common and abundant.

Knowledge about plants and their uses

The spearman rank correlation was used to analyze the knowledge about medicinal plant and its correlation with age of survey samples ($P < 0.005$).

RESULTS AND DISCUSSION

The present study revealed that the local people of Villupuram district, Tamilnadu, India were using 46 species of medicinally important plants belonging to 20 families (Table 1). These medicinally important plants were categorized in to five types: 14 herbs, 9 shrubs, 7 climbers, 1 small tree and 3 large trees. The most medicinally important plant species were observed in Malvaceae (4), Fabaceae (4) and Acanthaceae (4) family. These are commonly occurring medicinally important plants used to treat various diseases like cold, fever, cough, diarrhea, dysentery, skin diseases, toothache, indigestion, worm infestations, jaundice, liver diseases and as an antidote for poison and in wound healing. This is constant with the other general observation which has been reported earlier in relation to medicinal plant studies by the Indian Traditional System of Medicine like Siddha and Ayurvedha (Kirtikar and Basu, 2001; Gogte, 2000;

Table 1. Ethnomedicinal plants, local name, mode of preparation uses and major chemical constituents of Ethno medicinal plants in Villupuram district, Tamilnadu, India.

Botanical name and (Voucher specimen number)	Family	Local name	Parts used, mode of preparation, ethnomedicinal uses and some other plants used as ingredients	Major chemical constituents
<i>Abutilon indicum</i> Don. Sweet (P302)	Malvaceae	Thuthi	The juice of the plant is used for blood dysentery, fever, and allergy. Fried leaves are used as a remedy for jaundice, piles, ulcer and leprosy.	Alkaloids, flavonoids, sterols, triterpenoids, glycosides and water soluble galactomannan have been isolated from leaves, stem, root bark and seeds (Vandana Sii et al., 1997).
<i>Aristolochia bracteolata</i> Lam. (P411)	Aristolochiaceae,	Atuthedapalai	The root powder is combined with honey and is given internally given in the case of syphilis, gonorrhoea, boils, foul ulcers and other skin diseases. The bruised leaf is mixed with castor oil and is applied externally, in obstinate cases of eczema, to children's legs	
<i>Atalantia monophylla</i> Corr. (P3574)	Rutaceae	Kattu elemitchai	The leaves are boiled with water externally and used for rheumatoid pain and glandular swelling. The essential oil of the fruit is used for joint pain.	Atalaphylline and Atalaphyllinine alkaloids extracted from the root bark (Gururaj et al., 1981). Limonoids, atalantin and the others, dehydroatalantin and cycloepitalantin were obtained by Dreyer et al. (1976). Toxic lectin and abrin agglutinin from the seeds and two triterpenoid saponins 1 and 2 were isolated from the aerial parts of the plant (Albert et al., 2001; Anam, 2001). The sweet-tasting oleanane glycoside, glycyrrhizin and cycloartane glycosides, namely abrusosides
<i>Abrus precatorius</i> Linn. (P015)	Fabaceae	Kuntrimani	The decoction of roots has been used as a folk medicine for diuresis and the relief of fever, sore throat, bronchitis and hepatitis.	A-E were extracted from it leaves (Choi et al., 1989). Two new alkaloids methyl ester of N, N-dimethyltryptophan etho cation and precatorine and addition, hypaphorine, choline and trigonelline were isolated from the seeds (Ghosal and Dutta, 1971).
<i>Asparagus racemosus</i> Wild (P384)	Liliaceae	Thanneervitankil angu	The decoction obtained from the root has been used to cure blood diseases, diarrhoea, dysentery, cough, bronchitis and general debility. The root is boiled with cow milk used for increasing milk secretion during lactation.	Asparinins, asparosides, curillins, curillosides and shavatarins have been isolated from the root (Patricia et al., 2006).

Table 1. Cont'd.

<i>Achyranthes aspera</i> Linn. (P165)	Amaranthaceae	Nayurivi	The young shoots of the plant are fried with the bulb of <i>Allium sativum</i> and are used along with sesame oil internally in the case of dog bites and other poisonous cases. Burned root ashes are applied on the teeth which are infected with worms for reducing pain and as well as to expel the dead worms out. The juice extracted from the leaf is used to treat primary infection of tuberculosis.	Alkaloids of the betaine type or betalaine were identified in the leaves and roots (Bhom et al., 1992).
<i>Borreria verticillata</i> (L.) G.F.W. Meyer (P2449)	Rubiaceae	Nathaisoori	The tea forms of the root decoction are used in the treatment of leucorrhoeas and gonorrhoeas.	A new bis-indole alkaloid, spermacoceine and in addition, the known indole alkaloids, borrerine, borreverine and isoborreverine were isolated from the aerial parts of plant (Balde et al., 1991).
<i>Barleria prionitis</i> (P2223)	Acanthaceae	Karunta	The juice of the leaf is used to treat cataract and fever. The dried bark is used in cough treatment and the leaves are chewed to relieve toothache. The paste of the root is applied to disperse boils and glandular swellings. Leaves are also used by some tribal communities for treatment of piles and to control irritation and stiffness of limbs, enlargement of scrotum and sciatica.	Scutellarein 7-rhamnosylglucoside has been isolated from the whole plant (Harborne et al., 1971).
<i>Boerhaavia diffusa</i> Linn. (P523)	Nyctaginaceae	Mukiratai	The decoctions of roots are used for the treatment of dyspepsia, jaundice, enlargement of spleen, abdominal pain and as an antistress agent.	Punarnavine, β-sitosterol, β-Dglucoside, tetracosanoic, hexacosanoic, stearic, palmitic, arachidic acid, hentriacontane, urosolic acid, punarnavoside and liriodendrin (Misra and Tewari, 1971; Lami et al., 1991).
<i>Clerodendrum phlomidis</i> Linn. (P508)	Verbenaceae	Thaluthalai	The juice of the leaves is used as an alterative and bitter tonic. The decoction of the root is slightly aromatic and astringent and is used as a demulcent in gonorrhoea. It is also given to children during convalescence of measles. The fresh juice of the leaves is used to treat mental tension and mental disturbance.	A new chalcone glycoside and together with pectolarigenin, 7-hydroxyflavone and 7-hydroxyflavanone 7-O-glucoside have been isolated from the leaf and flowers (Roy and Pandey, 1994).
<i>Coleus aromaticus</i> Benth. (P482)	Labiatae	Karpuravalli	The leaf juice is used for the treatment of headache, fever, epilepsy and dyspepsia. The decoction of the leaves is administered in the case of chronic cough and asthma.	The major components of the oil are carvacrol, chlorogenic acid, rosmarinic acid and caffeic acid have been isolated from the leaf (CSIR, 1986; Kumaran and Joel, 2007).

Table 1. Cont'd.

<i>Cissampelos pareira</i> Linn. (P3856)	Menispermaceae	Ponmusutai	The paste of the root is used as an external application and has the property of wound healing, antidote, fistula, pruritis, skin disorders and snake poison. Internally roots are useful in the case of anorexia, indigestion, abdominal pain, gastric disorders, diarrhoea and dysentery. Traditionally the plant used for blood purification and anti-inflammatory properties.	Cissampeloflavone have been isolated from the aerial parts of the plant (Irama et al., 2003). Pareitropone has been isolated from its roots (Hiroshi 1995). Cissampareine, a bis-benzyl-isoquinoline alkaloid, (Anonymous, 1992).
<i>Calophyllum inophyllum</i> Linn. (P3277)	Guttiferae	Punnai	The oil of the seeds and roots are beneficial in the treatment of wounds and scabies. The plant is also recommended in leprous nephritis.	Inoxanthone 3, caloxanthenes A&B, macluraxanthone, calophynicacid, brasiliensicacid, inophylloidicacid, friedelan-3-one, calaustalin, calophyllolide, inophyllums (Marie et al., 2004). The seed oil contains costatolide, calophyllolide, calanolide A (Claude Spino et al., 1998).
<i>Cadaba fruticosa</i> (L.) Druce (P2401)	Cappadidaceae	Vizhuthi	The leaf juice is internally used in the case of general weakness and energetic during dysentery and diarrhoea and also to relieve general body pain, antidote against poisoning, stimulant, and antiscorbutic.	Provitamin A, cadabine, stachydrine were isolated from the leaves (Viqr and Anwer, 1975).
<i>Cleome gynandra</i> Linn. (P0333)	Cappadidaceae	Thaivelai	A decoction or infusion of boiled leaves and/or roots has been administered to facilitate childbirth. Bruised leaves, which are rubefacient and vesicant, are also used to treat neuralgia, rheumatism and other localized pains. Sap from leaves has been used as an analgesic particularly for head ache, epileptic fits and ear ache.	Cleogynol has been isolated from the aerial part of the plant (Das et al., 1999).
<i>Cynodon dactylon</i> (P5617)	Poaceae	Arugampul	The juices obtained from leaf are internally useful in blood vomiting. Externally the plant is applied on chronic wounds.	Not reported
<i>Dodonaea viscosa</i> (P5758)	Sapindaceae	Verrali	The stem and roots are used for the treatment of rheumatism, skin infections and diarrhoea. The plant decoction is useful in the case of pains of hepatic or splenic origin, uterine colic and other disorders involving smooth muscles. It is also used as an antipuritic in skin rashes and for the treatment of sore throat, dermatitis and haemorrhoids.	Dodonosides A and B were isolated from the seeds (Hildebert et al., 1987). Viscosol, prenylated flavonoid penduletin and 6-methoxyflavonols, flavanone, isorhamnetin 3-rhamnosylgalactoside, alizarin were isolated from the aerial parts of this plant (Kusum et al., 1986; Kusum et al., 1983).

Table 1. Cont'd.

<i>Evolvulus alsinoides</i> Linn. (P421)	Convolvulaceae	Vishnukaranthai	The whole plant extracts are used to treat brain disorders like insanity, epilepsy, memory enhancement and nervous debility. The strong decoction is internally used in the case of intermittent fever.	The whole plant contained an alkaloid evolvine, pentatriacontane, triacontane sistosterol, a glycoflavone, 4- methoxy vtexin and phenolic acid such as p-hydroxybezoic vanilic, protocatechic and gentisic acid and quinones (Nair et al., 1988).
<i>Elytraria acaulis</i> Linn. (P2235)	Acanthaceae	Nelakatambu	The whole plant is internally and as well as externally used in the case of deworming.	Two pyrazole alkaloids with asomnine and 4'-hydroxywithasomnine have been isolated from the whole plant (Ravikantha et al., 2001).
<i>Enicostemma littorale</i> Blume (P326)	Gentianaceae	Vellerugu	The decoctions attained from the leaves are used in rheumatism, abdominal ulcers, hernia, swelling, itches and insect poisoning.	The presence of alkaloid gentianine and the bitter glycoside swertiamarin has been identified (Govindachari et al., 1966; Vishwakarma et al., 2004). Qualitative analysis of aqueous extract in whole plant presence of phenols, tannins, flavonoids, glycosides, anthroquinones and sterols (Vasu et al., 2003).
<i>Euphorbia hirta</i> L. (P107)	Euphorbiaceae	Ammanpatcharisi	The decoction of the flowers and fruits are used in the treatment of asthma and respiratory tract infections and sometimes the extracts are combined with bronchial sedatives. The latex is externally applied for wounds.	The whole plant contained cycloarterinol, 24-methylene-cycloarterinol, β -sitosterol, euphorbol hexacozone, β -amyrin acetate, 1-hexacosanol, ingeno-triacetate, tinyaloxin, campesterol, stigmasterol and quercitin (Gupta and Garg, 1966; Atallah and Nicholas, 1972; Sofowora, 1984; Galvez et al., 1993).
<i>Garcinia indica</i> (Thouars) Chois (P3352)	Guttiferae	Pazhampuli	The aerial extract has been used as a pink and purple food colouring agent and as well as a spice to give a sour and sweet taste. In addition to food usage, it has also been used as a cosmetic ingredient, inflammation and other disorders.	Garcinol, a polyisoprenylated benzophenone, from the fruit rind, has been suggested to be an anti-inflammatory and anti-cancer agent (Jungil et al., 2007).
<i>Hibiscus rosa-sinensis</i> Linn. (P3724)	Malvaceae	Semparathai	The soaked petal along with coconut oil is externally applied for alopecia. The leaves and flowers are observed to be promoters of hair growth and it aids in healing of ulcers.	β -arabinopyranoside was isolated from its roots (Sheng-Xiang et al., 1998).

Table 1. Cont'd.

<i>Helicteres isora</i> Linn. (P123)	Sterculaceae	Vallampurikai	The decoction of the root is mixed with turmeric powder and is applied externally to treat cuts and wounds. The fruit is boiled with sessamum oil, cooled and then the filtered oil (2 to 3 drops) is poured into the ear for otalgia disease.	Phytosterols, saponins, sugars, phlobotannins, lignin, triterpenoids and their acetates are phytochemicals reported by Saraswathi Bai (1954). Cucurbitacin B, isocucurbitacin B, flavonoids, flavonoid glucuronides and neolignans were obtained from the aerial part of this plant (Bean et al., 1985).
<i>Ixora coccinea</i> Linn. (P161)	Rubiaceae	Idlipoo	The decoction yielded from the flowers is used in the treatment of dysentery, leucorrhoea, dysmenorrhoea, haemoptysis, bronchitis and scabies.	Octadecadienoic acid was isolated from the root bark and methyl ester of palmitic, stearic, oleic and linoleic acids in root oil and anthocyanins from the flowers (Dhavan et al., 1977).
<i>Indigofera aspalathoides</i> Vahl. (P502)	Fabaceae	Shivanar vembu	The roots are soaked with coconut oil and they are used for chronic eczema, acute tumour, psoriasis. Root is chewed for toothache and abscess.	Cyclooxygenase-1 and cyclooxygenase-2 were obtained from the whole plant (Selvam et al., 2004).
<i>Justicia simplex</i> D. Don (P3045)	Acanthaceae	Odivuatiki	The leaf extract is externally applied in the case of bone fracture which enhances in fusion and strengthening of bones.	Simplexolin, sesamin, asarinin, sesamol and a new octane lignan, named justisolin, and a new lignan O-glucoside, named simplexoside, were isolated from the whole plant (Shibnath et al., 1979, 1980).
<i>Limnophila indica</i> (L.) Druce (P561)	Scrophulariaceae		The whole plant is used in the treatment of pestilential fevers, dysentery and elephantiasis.	Two flavonoids, (2S)-5,7,3,4-tetramethoxyflavanone and 5,7,2,5-tetramethoxyflavone together with three known flavonoids, 7-O-methylwogonin, skullcapflavone and 5-hydroxy-7,20-dimethoxyflavone were isolated from the whole plant. Hydroxy-6,8-dimethoxy-3,4-methylenedioxyflavone has been isolated from the root and aerial part of the plant (Mukherjee et al., 1998).
<i>Melothria maderaspatana</i> (L.) Cogn. (P487)	Cucurbitaceae	Musumusukai	The leaf juices are used to treat asthma and allergic. Root extract combined with Cuminum cyminum is used to treat spermatorrhea.	Columbin has been isolated from the whole plant (Yu and Hong, 1973).

Table 1. Cont'd.

<i>Mimosa pudica</i> L. (P2417)	Mimosoideae	Thottasiniki	The leaves extracts are used in the treatment of headache, migraine, insomnia, diarrhoea, dysentery, fever, piles and fistula. The leaf and stem has been used in the treatment of scorpion sting. Root popularly used against cobra bite by snake charmers and <i>Bejs</i> . Root powder combine with cow milk used for aphrodisiac.	The aerial part of the plant on isolation yielded three O-glycosyl flavonoids namely isoquercitrin, avicularin and apigenin-7-O-β-D-glucoside and also four C-glycosyl flavonoids, cassiaoccidentalinalin B, orientin and isoorientin (Misra, and Tewari, 1971; Annelise et al., 2002).
<i>Mucuna pruriens</i> L. DC. (P504)	Fabaceae	Poonaicali	The dried seed is boiled with cow milk, and then the seed is dried in sunshade, after which the seed is powdered and combined with cow milk which is effective in treating male sterility and nervous diseases.	The presence of alkaloids in seed has been reported with the tentative names like prurienine, prurieninine, prurienidine (Rakshit and Majumdar, 1956; Ghosal et al., 1971).
<i>Oroxylum indicum</i> (P3867)	Bignoniaceae		Its seeds decoction have been used as an analgesic, antitussive and anti-inflammatory agent for the treatment of cough and bronchitis.	Four flavonoids, chrysin, baicalein, baicalein-7-O-glucoside, baicalein-7-O-diglucoside (Oroxylum B) and one unknown flavonoid have been isolated (Li-Juan et al., 2003).
<i>Phyllanthus niruri</i> Linn. (P356)	Euphorbiaceae	Kizhkai nelli		Two new securinega-type alkaloids, isobubbialine, epibubbialine and as well as the three known alkaloids, phyllanthine, securinine and norsecurinine were isolated from the leaves.
<i>Piper betle</i> Linn. (P145)	Piperaceae	Vettrilai	Betel leaves are used for chewing and are credited with many medicinal properties such as digestive, stimulative, carminative and aphrodisiac. The fresh leaves immersed with sesam oil, then warmed with flame is applied for head ache and lactagogue.	The volatile oil of leaves consists, high content of safrol. In addition, eugenol, allyl diacetoxyl benzene and chavibitol acetate were identified as other major constituents of the betel oil (Kumaratunga, 2003). According to the preliminary screening studies carried out at Industrial Technology Institute, polyphenols, alkaloids, steroids, saponins and tannins were found in the Piper betle leaves (Anonymous, 2004).
<i>Pandanus amaryllifolius</i> (P13811)	Pandanaceae	Thazham poo	Tender shoots are directly eaten in the case of severe jaundice. The oil obtained from the leaf is described as stimulant and antispasmodic and is effective against headaches, rheumatism, and epilepsy and as a cure for sore throats.	The leaf contains essential oils, carotenoids, tocopherols and tocotrienols (Lee et al., 2004). However, the other alkaloids (such as, pandanamine, pandamerilactones) with pyrroline-derived structures are also found in the leaves (Nonato et al., 1993).

Table 1. Cont'd.

<i>Rhinacanthus nasutus</i> (L.) Kurz (P3165)	Acanthaceae	Nagamalli	The root powder is combined with lime juice and is applied for ring worm and skin diseases. The leaf extract is externally used for chronic wounds.	Quinol, 4-acetyl-3,5-dimethoxy-p-quinol, accompanied by 17 known compounds including triterpenoids, steroids, benzenoids, coumarin, anthraquinone, quinone, glycosides, carbohydrate and chlorophyll, were isolated from the leaves and stems of <i>R. nasutus</i> (Tian et al., 1995).
<i>Scoparia dulcis</i> Linn. (P661)	Scrophulariaceae	Sarkarai vembu	The leaf extract is used to treat respiratory, gastric and hepatic disturbances diabetes and hypertension.	Scopadulcic acid B and scopadulciol by leaf (Toshimitsu et al., 1997).
<i>Sida cordifolia</i> Linn. (P3798)	Malvaceae	Sitramuti	The leaves are used in for the treatment of stomatitis, blenorrhea, asthmatic bronchitis, and nasal congestion (Balbach, 1978). The roots possess diuretic and tonic properties and administered for nervous disorders such as hemiplegia and facial paralysis.	β -phenethylamines, carboxylated tryptamines, quinazoline alkaloids are β -phenethylamine, ephedrine, ψ -ephedrine, S-(+)-Nb- ethyltryptophan methyl ester, hypaphorine and sympathomimetic amines (Shibnath et al., 1975). Vasicinone and vasicine, vasicinol obtained by Gunatilaka et al. (1980).
<i>Solanum nigrum</i> Linn. (P589)	Solanaceae	Manathaccali	The juice taken from fresh leaves are used to treat for stomach ulcer.	Solasodine, solasonine, solanidine have been identified from the plant (Briggs et al., 1950; Schreiber et al., 1964).
<i>Tephrosia purpurea</i> (Linn.) Pers. (P114)	Fabaceae	Kolinchi	The whole plant has been claimed to cure diseases of kidney, liver, spleen, heart and blood.	Glycosides, rotenoids, isoflavones, flavanones, chalcones, flavanols, flavones, sterols and tephrosin, pongaglabol, and semiglabin have been isolated from the entire plant (Pelter et al., 1981; Ahmadu et al., 1999). Flavanone, purpurin, pongamol, isolonchocarpin, karanjin, lanceolatin-B and kanjone have been extracted from the seed (Dajinder et al., 1980).
<i>Tylophora indica</i> (P287)	Asclepiadaceae	Nacharuppan	Root decoction is internally used in the case of asthma and expectorant. Leaves decoction are internally used as an antidote to poison.	Tylophorinicine, tylophorine and tylophorinine have been isolated from the leaves (Mulchandani and Venkatachalam, 1984; Dewan and Virendra, 1981).
<i>Thespesia populanea</i> Cav. (P3828)	Malvaceae	Poovarasan	The decoction of the bark is commonly used for the treatment of skin and liver diseases. Oil of the bark mixed with vegetable oil is useful in urethritis and gonorrhoea, the bark and root, decoction used in dysentery, cholera and haemorrhoids.	Gossypol has been isolated from stem (Akhila and Rani, 1993). Four naturally occurring quinine viz. thespone, mansonone-d, mansonone-H, thespone and thespesone have also been extracted from heartwood of this plant (Johnson et al., 1999).

Table 1. Cont'd.

<i>Trichodesma indicum</i> R. Br. (P592)	(Boraginaceae) <i>Tricho</i> Boraginaceae	Kazhutha thumba	The whole plant is used as emollient and diuretic. The roots were used in the treatment of dysentery, cough, cold, fever and joint pain.	Plant have been identified as non-steroidal compounds; hexacosane, ethyl hexacosanoate and 21,24-hexacosadienoic acid ethyl esters from leaves (Hasan et al., 1982), and oleic, linoleic, palmitic, stearic and linolenic acid from seed oil (Badami et al., 1975).
<i>Tribulus terrestris</i> Linn. (P563)	Zygophyllaceae	Nerrinzil	The fruit decoction is combined with <i>Createava magna</i> stem bark internally used in the case of urinary infection and kidney stone disorder.	Two new compounds terrestrisamide and tribulusterine together with known compounds N-P-coumaroyltyramine, terrestrisamide, hecogenin, aurantiamide acetate, xanthosine, fatty acid ester, ferulic acid, vanillin, p-hydroxybenzoic acid and β -sitosterol were isolated and characterized from dried fruits of this plant (Tian et al., 1999).
<i>Withania somnifera</i> L. Dunal (P956)	(Solanaceae) Solanaceae	Ashwagandha	The root powder boiled with cow milk is internally used for adenopathy, arthritis, asthma, hypertension, inflammations and rheumatism. The leaves were also used as a cure for several illnesses including tumors, inflammations, conjunctivitis and tuberculosis.	The major chemical constituents reported from <i>W. somnifera</i> are called withanolides (Ganzera et al., 2003).
<i>Zingiber officinale</i> , Roscoe (P985)	Zingiberaceae Zingiberaceae	Inchi	The fresh juice taken from ginger is internally useful in the case of indigestion and liver diseases. Dried ginger is boiled with palm sugar candy and is internally useful in the case of chronic cough and cold.	Gingerols and shogaols were isolated from the rhizome and new gingerdione.

Anonymous, 1992; Asolkar et al., 1992).

Different types of preparation made from medicinally important plants included decoction, juice, powder, paste, oil and whole plant extract. Some plants were even used in more than one form of preparations. Majority of the plant preparation were in the form of decoction obtained from the roots, seeds, stem, leaves and flowers of *Abrus precatorius*, *Ixora coccinea*, *Dodonaea viscosa*, *Asparagus racemosus*, *Oroxylum indicum*, *Boerhaavia diffusa*, *Borreria verticillata*,

H. isora, *C. plomidis*, *Cleome gynandra*, *Enicostemma littorale* and *Euphorbia hitra*. Preparations in the form of Juices were attained from the leaves of *Abutilon indicum*, *Barleria prionitis*, *Coleus aromaticus*, *Cadaba fruticosa* and *Melothria maderaspatana*. Powder preparations were made from the roots, leaves and fruits of *Aristolochia bracteolata*, *Minosa pudica*, *Rhinacanthus nasutus* and *Withania somnifera*.

The roots and leaves of *Acalypha indica* and

Cassia alata yielded paste formation. *Indigofera asphalathoides*, *Hibiscus rosa-sinensis*, *Wrightia tinctoria*, *Atalantia monophylla* and *Calophyllum inophyllum* plants were used for oil formation. The whole plant extracts resulted from plants like *Evolvulus alsinoides*, *Elytraria acaulis*, *Limnophilia indica*, *Trichodesma indicum* and *C. gynandra* (Table 1). The leaves and roots are the two major plant parts which are frequently used for the treatment of diseases by the local people of Villupuram. External applications prepared from

medicinal plants are used to cure many diseases like skin diseases, wounds, rheumatism, poisonous bites and dandruff. Oral consumption involves curing fever, cold, cough, diarrhoea, jaundice and indigestion. The local people of the Villupuram prescribed the medicinally important plants either as single or as in combination with several plants to cure suffering of the people from illness. The local people preferred preparing medicines by combining several plant parts, since the combination rapidly cures the diseases and also enhances the immunity power of the patients. For example, coconut oil is combined with some medicinally important plant leaves like *W. tinctoria*, *C. alata*, *H. rosa-sinensis* and *C. inophyllum* for treatment of skin diseases.

Medicinal preparations attained from either a part of a single plant or a single whole plant such as *B. diffusa*, *B. prinitis*, *C. fruticosa*, *E. alsinoides*, *E. acaulis* and *E. littorale* are used in the treatment of jaundice, indigestion, fever, general weakness and deworming of intestine. Roots of *Aristolachia bracteolata*, *Asparagus racemosus*, *Withania somnifera* are used to treat male sterility, syphilis and gonorrhoea. The leaves, roots and flowers of *Clerodendron phlomidis*, *Helicteres isora*, *Melothria maderaspatana* are used to treat spermatorrhea, indigestion, odalgic diseases and also in wound healing.

Medicinal plants play an important role in providing knowledge to the researchers in the field of ethno botany and ethno pharmacology. The observations of present study showed that traditional medicine plays a significant role among the local people of Villupuram. Besides this, in other districts of Tamilnadu like Kancheepuram, Tirunelveli and Tiruvanamalai, practitioners are practicing the traditional system of medicine namely Siddha and Ayurvedha.

In Villupuram, the traditional medicinal system is very efficient, supportive and successful in treating jaundice, female sterility and rheumatism. On interviewing, six local traditional healers of Villupuram informed that the young tender shoots of *Pandanus* spp. along with over night soaked boiled rice water is given to patients in early morning who suffer from severe jaundice for curative purpose because the leaves of *Pandanus* spp. are a natural antioxidant and *Pandanus* extracts are capable of retarding oxidation (Fatihanim Mohd Nor et al., 2008). The leaves of the plant *Phyllanthus niruri* is combined with white goat milk and taken with empty stomach in three doses for effective treatment of severe jaundice and liver diseases and it also enhances the appetite (Sankaranarayanan, 2008). In recent research, this plant has gained world wide attention due to its effectiveness against Hepatitis B (Yeh et al., 1993). In the modern research, this plant is found to contain an antiviral activity extended to the human immunodeficiency virus (Qian-Curtrone, 1996).

Data collected from the Villupuram district were compared with available data in other districts of Tamilnadu like Kancheepuram and Tirunelveli. An interesting

observation was that some medicinally important plants such as *Achyranthes aspera*, *W. tinctoria*, *Mukia maderaspatana*, *A. indica*, *Abrus precatorius*, *H. rosa-sinensis*, *Mimosa pudica*, *B. diffusa* and *Solanum nigrum* were found to be practiced as important medicinal plants in Kancheepuram district for the treatment of various diseases like dog bites, skin diseases, cold, fever, deworming, wounds and hydrocele (Chellaiah Muthu et al., 2006). Apart from this, medicinal plants like *E. alsinoides*, *Helicteres isora* and *Ocimum basilicum* are practised among the Kani tribals of Tirunelveli hills for their medicinal value to treat venereal diseases, fever and cold and also as a hair growth promoter (Ayyanar and Ignacimuthu, 2005).

Conclusion

There is always a hunt for rich ethno botanical knowledge for ethno botanical studies of medicinal plants. Further, this research has placed on records the local uses of medicinally important plants which were interviewed among 275 local people of Villupuram district. The traditional healers are the main source of knowledge on medicinal plants. In Villupuram district, many local people are going for agriculture and sustainable harvesting of plants with medicinal value which helps not only in conservation of these traditional medicinally important plants but also in marketing of these plants and their products for economic growth of the people. Finally, to conclude, this research article will attract the attention of ethno botanists, phytochemists and pharmacologists for further critical investigation of medicinal plants present in the districts of Tamilnadu, India.

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