**Original Research Article****DOI: 10.26479/2019.0503.34****SURVEY ON MEDICO-BOTANICAL TREES IN PAZHAYAR RIVER
BANK OF KANYAKUMARI DISTRICT, TAMILNADU****Uma R*, B. Parthipan**

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ABSTRACT: The total of 35 tree medicinal plants species collected through folk information from elderly villagers and local medicine men along the river bank of Pazhayar in Kanyakumari district. The plant species are belonging to 31 genera with 21 families. Among them Leguminosae is dominant family which has contributed 7 plant species followed by the families Anonaceae, Arecaceae and Myrtaceae 3 species each and remaining families have single plant species. Different parts of the same plant are being used to treat various diseases. Among the uses of medicinal plant parts leaves are most useful part of tree medicinal species about 21 species followed by bark 20 species and fruits 20 species. Of these 35 plants 8 plants are exotic, 2 plants are vulnerable and only one plant is least concern. The communication is impressed the preparation of conservation strategies for medicinal species of the area.

KEYWORDS: Medicinal trees, Pazhayar River, Ethnobotany, Kanyakumari district, conservation.

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1.INTRODUCTION

Plant medicines are widely used by all sections of human population either as folk remedies or directly from the codified medicinal systems with modern herbal preparations. Indigenous herbal treatment is a part of the culture and dominant mode of therapy in most of the developing countries. These traditional phytotherapies, with a considerable extent of effectiveness, are socially accepted, economically viable and mostly are the only available means. One-third of the modern pharmaceutical preparations have botanical origin [1]. Out of nearly 18,500 higher plant species estimated in India, about 7500 species are reported to be medicinal use by rural and tribal communities [2]. Traditional medicine based on herbal remedies has always played a key role in the

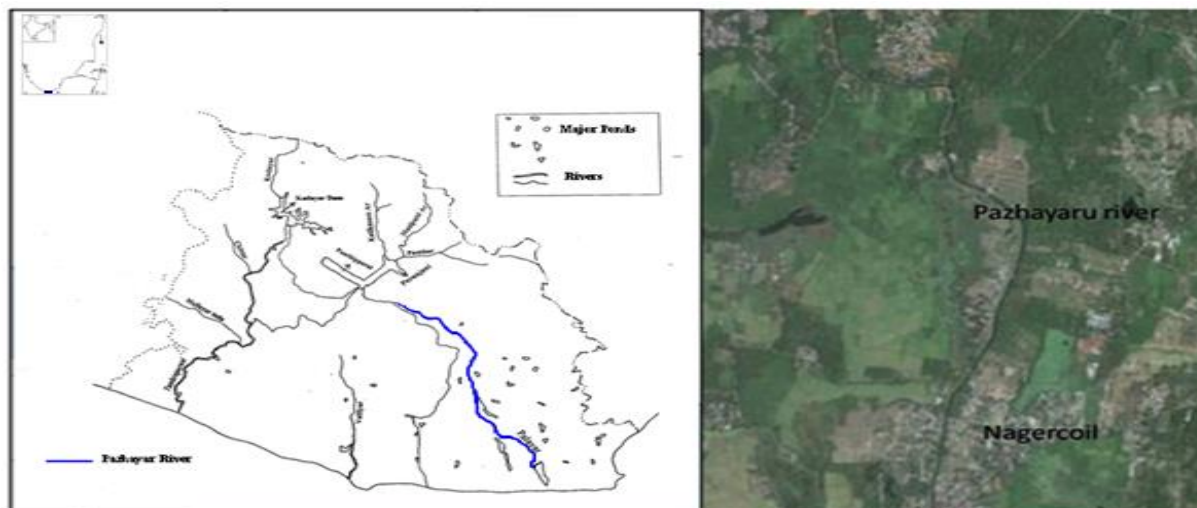
primary health care system of our country. In India the native people are exploiting a variety of herbals for effective curing of various diseases. The plant parts used, preparation, and administration of drugs vary from one place to other. However, the knowledge of herbal medicine is gradually disappearing, although some of the traditional healers are still practicing the art of herbal healing effectively. Listed trees in this communication are frequently used by the local inhabitants of the area for treatment of various health ailments. Ethnomedicinal studies have offered immense scope and opportunities for the development of new drugs. The value and importance of traditional knowledge are now being increasingly acknowledged all over the world. The pharmaceutical industry continues to investigate and confirm the efficacy of many medicines and toxins used by traditional communities [3]. Many works have been reported specially from among the rural and tribal communities of India [4, 5, 6, 7, and 8]. A review of literature revealed that the medicobotanical studies in Kanyakumari District of Tamilnadu is limited especially the traditional knowledge on the plant use of local people [9, 10]. Hence, we aimed to document the information on medicinal plants along the river bank of Pazhayar. The results obtained more interestingly many number of tree species as claimed medicinal potential for local health care. We presented the results only on the medicinal trees of Pazhayar river banks of Kanyakumari District, Tamilnadu in the communication.

2. MATERIALS AND METHODS

2.1 Study area

The river Pazhayar of Kanyakumari District originated at an altitude 1300 m msl in the western slope of Mahendragiri hill range and flow into Arabian sea near Manakudi estuary, which is 12 km in south of Nagercoil. Along the river bank human interference was vast and agriculture is very intense since the past. About 10 check dams were constructed across the river in different places for irrigation management purposes. The vegetation is dense and very lush thickets both the sides of banks which served the habitat for number of medicinal species (Map 1).

Map 1. Location of Pazhayar River in Kanyakumari District, Tamilnadu.



2.2 Medicinal Plant survey

Frequent field surveys were conducted during the March 2012 to October 2014. The floristic inventory were recorded all plant species in the area along the river bank by random sampling method. When floristic documentation of Pazhayar river, interviews were conducted with local people, medicine men and elderly settlers nearby the river for documenting medico-botanical knowledge of the local people and utilization value of the plant species. The interviews were made particularly for knowing local name of the plant species, medicinal uses, plant part used and other purposes of each plant species. The results were tabulated with all details.

2.3 Preservation and Identification of plant materials

The voucher specimens collected from the field were prepared the herbarium and were deposited in the Department of Botany, S.T. Hindu College, Nagercoil. The primary identification done with help of local Floras [11, 12] and the authentication of the identity of plant species were confirmed with specimens deposited in Botanical Survey of India, Southern Circle, Coimbatore. The valid nomenclature of the plant species were checked with Kew website, The Plant List 2010 on line (www.theplantlist.org). IUCN threatening category of the plant species were also checked from IUCN web site (www.iucn.org) The plants species were also checked with the websites www.flowersofindia.net and indiabiodiversity.org

3. RESULTS AND DISCUSSION

The results of the medicinal trees and their botanical names, families, plant parts used medicinal uses, diversity status, mode of preparation and disease names are given in table 1. The total number of 35 tree medicinal plants species collected from the study area and they belongs to 31 genera with 21 families. Leguminosae is dominant tree medicinal plant family which has contributed 7 (Caesalpiniaceae 4, Fabaceae 1 and Mimosaceae 2) plant species followed the Anonaceae, Arecaceae and Myrtaceae 3 species each, Anacardiaceae, Malvaceae, Moraceae, Rhamnaceae having 2 species each and remaining families have single plant species. Among the uses of medicinal plant parts, Fruits are the most useful part of tree medicinal species about 9 species followed by bark (8 species), leaves (7 species each), oil (3 species), flowers (2 species), root (2 species), root bark, seeds, slender twig, wood (one species each). The mode of administration of the drug is mainly by oral application along with milk or other ingredients and applied topically or externally for curing various ailments. Plants are arranged alphabetical in order of their botanical names, followed by the families, parts used, diversity status and mode of preparation of drugs for various diseases (Table 1).

Table 1. Enumeration of medicinal trees and their uses in Pazhayar river bank of Kanyakumari district (NA = Not assessed, LC = Least Concern, VU = Vulnerable).

Scientific Name	Family	Parts used	Diversity Status	Mode of Preparation	Disease Name
<i>Albizia lebbbeck</i> (L.) Benth.	Mimosaceae	Bark	NA	If stem of the bottlegourd, <i>Hygrophila spinosa</i> and <i>Cyperus rotundus</i> are mixed with the bark of this tree and made into an infusion, it cures oedema if consumed 100ml every day. Gingelly oil, tamarind and mustard to be avoided during this medication.	oedema
<i>Anacardium occidentale</i> L.	Anacardiaceae	Oil	Exotic	Oil is expressed from the shell of the nut is vesicant and rubefacient. This is used in treating skin diseases and cracks of the heel.	skin diseases
<i>Annona reticulata</i> L.	Annonaceae	Fruit	NA	The unripened fruit checks diarrhoea and dysentery.	diarrhoea and dysentery
<i>Annona squamosa</i> L.	Annonaceae	Leaves	NA	The paste made out of leaves and fruit without water is an ideal curative for skin ulcers and eczema.	eczema and skin ulcers
<i>Areca catechu</i> L.	Arecaceae	Leaves	NA	Tender leaves boiled with oil could be used externally for rheumatic complaints.	rheumatism
<i>Bombax ceiba</i> L.	Malvaceae	Leaves	NA	Leaves ground into paste are applied to skin diseases.	skin diseases
<i>Borassus flabellifer</i> L.	Arecaceae	Flower	Exotic	The ash of the flower is applied externally to cure ulcers.	ulcers
<i>Calophyllum inophyllum</i> L.	Guttiferae	Seeds	LC	Seeds are ground in water is heated and if used as an external application cures rheumatoid arthritis.	rheumatoid arthritis
<i>Carica papaya</i> L.	Caricaceae	Fruit	NA	If this fruit with honey is consumed by lactating mothers, it improves milk secretion. Fruits are edible.	improves milk secretion for mothers

<i>Cassia fistula</i> L.	Caesalpiniaceae	Root	NA	The root bark decoction is given in fever and heart affections. The bark of the plant and root of <i>Solanum trilobatum</i> in equal quantity is powdered. If the powder is consumed with honey and cow's milk, it cures asthma, phlegm and difficulty in breathing.	asthma, phlegm,
<i>Casuarina equisetifolia</i> L.	Casuarinaceae	Root	NA	The decoction of the root cures dysentery and diarrhoea	dysentery and diarrhoea
<i>Cocos nucifera</i> L.	Arecaceae	Fruit	NA	If the milk squeezed out of the coconut is consumed regularly it cures intestinal ulcers.	intestinal ulcers
<i>Delonix elata</i> (L.)Gamble	Fabaceae	Leaves	NA	The hot decoction of the leaves used externally to reduce the pain and inflammation of the joints.	inflammation of the joints
<i>Delonix regia</i> (Hook.) Raf.	Caesalpiniaceae	Fruits	NA	The fruit juice mixed with sugar relieves cough and act as coolant.	cough
<i>Eucalyptus globulus</i> Labill.	Myrtaceae	Oil	Exotic	Large quantity of eucalyptus oil is used as an aromatic agent in soaps.	aromatic agent in soap
<i>Eugenia jambolana</i> Lam.	Myrtaceae	Bark	NA	Paste of the bark is applied to reduce inflammations and boils.	inflammation and boils
<i>Ficus benghalensis</i> L.	Moraceae	Slender twigs	NA	Slender twigs of the tree are good for brushing tooth and strengthen gums and teeth.	strengthen the teeth
<i>Ficus religiosa</i> L.	Moraceae	Bark	Exotic	It is used in antileprosy medicine by soaking the bark in coconut toddy for one week and dried in sun. This dried powder if it is applied on the ulcers of the affected area, gives relief.	leprosy, ulcers
<i>Mangifera indica</i> L.	Anacardiaceae	Bark	NA	Bark of the tree with <i>Asparagus</i> root and root tubers of ground palm are powdered and made into an infusion. Oil is added with this infusion and boiled. If this is used as on the head	venereal diseases

				during bath it reduces venereal diseases and acts as antidote for poisonous bites.	
<i>Melia azedarach</i> L.	Meliaceae	Leaves	NA	The paste of the leaves and turmeric is used externally on the eruption of the small pox.	small pox
<i>Morinda coreia</i> var. <i>tomentosa</i> (Hook.f.) R.R.Fernandez	Rubiaceae	Fruits	NA	Unripened fruit is used in the form of pickles. This gives relief from rheumatism.	rheumatism
<i>Moringa oleifera</i> Lam	Moringaceae	Root bark	NA	Root bark is an excellent antidote for poisons.	antidote for poisons
<i>Murraya koenigii</i> (L.) Spreng.	Rutaceae	Leaves	NA	Leaves are boiled in milk and ground for a good application in poisonous bites and to eruptions. Leaves are popularly used for flavoring curries and condiments.	antidote for poisonous bites
<i>Musa paradisiaca</i> L.	Musaceae	Flower	NA	Juice of the flowers with palm sugar if taken internally it cures stomach ache.	stomachache
<i>Phyllanthus emblica</i> L.	Euphorbiaceae	Fruits	NA	The fruit is made into a paste and the paste is rubbed on the head before bath. This cools the eyes.	eye coolant
<i>Polyalthia longifolia</i> (Sonn.) Thwaites	Anonaceae	Bark	NA	The infusion of the bark is useful in treating diarrhoea and dysentery.	diarrhoea and dysentery
<i>Prosopis juliflora</i> (Sw.)DC.	Mimosaceae	Bark	Exotic	Bark of this plant is used to treat scorpion sting and rheumatism.	rheumatism
<i>Psidium guajava</i> L.	Myrtaceae	Fruit	Exotic	Un ripened fruit checks diarrhoea.	diarrhoea
<i>Santalum album</i> L.	Santalaceae	Wood	VU	The infusion made out of the powdered wood cures indigestion.	indigestion
<i>Saraca asoca</i> (Roxb.)Willd.	Caesalpiniaceae	Bark	VU	The powdered bark along with same quantity of Poonakali seeds (<i>Mucuna pruriens</i>) powder is used as an ideal medicine for Leucorrhoea.	leucorrhoea
<i>Tamarindus indica</i> L.	Caesalpiniaceae	Leaves	Exotic	Roasted leaves are applied to reduce the inflammation	inflammation
<i>Tectona grandis</i> L.f.	Verbenaceae	Oil	NA	The oil of the bark is used in treating	itching

				itching of the skin.	
<i>Thespesia populnea</i> (L.) Soland. ex Correa	Malvaceae	Bark	NA	Barks are cut into small pieces and boiled. Then the water is filtered and if it is consumed three times it acts as laxative.	laxative
<i>Zizyphus jujuba</i> (L.) Karst.	Rhamnaceae	Fruits	NA	Fruit purifies blood and assists digestion.	blood purifier
<i>Zizyphus mauritiana</i> Lam.	Rhamnaceae	Fruit	Exotic	If fruit is consumed regularly it gives relief from indigestion.	indigestion

The present study has given information on various parts of medicinal plants used for different types of diseases such as diarrhoea, dysentery, eczema, stomach diseases, rheumatism, inflammatory diseases, venereal diseases, phlegm, dental infection, eye diseases, skin diseases, oedema, etc.. About 4 medicinal plants are used to treat diarrhoea and dysentery, various parts of most of the plant species are used to treat inflammatory diseases such as inflammation on joints, ulcers, wounds, boils, eczema. 1 plant species is used as eye coolant. 1 plant species improves milk secretion of mothers. 2 plant species are used as antidote for poisonous bites. In *Carica papaya* the fruits are edible. In *Moringa pterigosperma* leaves are used as vegetable. According to diversity status, among the 35 medicinal trees 8 species (*Borassus flabellifer*, *Ficus religiosa*, *Psidium guajava*, *Tamarindus indicus*, *Prosopis juliflora*, *Zizyphus mauritiana*, *Eucalyptus globules*, *Anacardium occidentale*) are exotic. *Saraca asoca* and *Santalaum album* is vulnerable and one species shows least concern (*Calophyllum inophyllum*). Comparison of the 10 largest families in order of their species richness and order of dominance with that of India [13] and Madras Presidency [11] showed that many of these families are well represented in the study area, but the ranks are slightly altered. Leguminosae which forms the largest family in the Madras Presidency, take the first position in the Flora of Tamilnadu and plants of Western Ghats, whereas in the same family occupies in first position in the present study. Some plants are used for various treatments like healing wounds, throat infection, diarrhoea, itching, skin diseases, headache, stomach ulcer, tumour, earache, eyepain, diabetes, cold and cough in general are also documented [14]. Biodiversity is the very basis of human survival and economic well being and encompasses all life forms, ecosystems and ecological process [15]. Biodiversity reflects variety and variability within and among living organisms, their associations and habitat-oriented ecological complexes. All types of flora and fauna are elements of biodiversity and influenced by various climatic conditions such as temperature, availability of moisture in the form of humidity and precipitation, and variation in physiographical conditions – soil, altitude, slope, etc. [16, 17, 18, and 19]. It has attracted world attention because of growing awareness of its importance on one hand, and the anticipated massive depletion on the other. Expanding human

population has caused increased resource exploitation and the alteration of land used pattern. Biodiversity rich areas could have strong human impact [15]. Over the years trees have undergone different levels of disturbance due to unprecedented increase in human population, which have led to cutting of trees for firewood collection, charcoal production, and infrastructural developments [20]. To protect trees from declining, it is essential to examine the current status of species diversity, composition and abundance as it will provide guidance for their management and valuable reference for assessment as well as improve our knowledge in identification of ecologically useful species [21]. A higher number of tree species increases the number of ecological niches and as well as the number of associated species [22, 23]. More so, trees provide many ecosystem services such as species conservation, prevention of soil erosion, and preservation of habitat for plants and animals [24]. Over exploitation has resulted in the rapid loss of tree diversity and is recognized as a major environmental and economic problem around the world [25]. Giant trees acts a barrier protecting the river banks from soil erosion and the check dams slow down the flow of the river where by recharging the ground water and increasing the water table. Neighboring agricultural activities along the riparian landscapes, uncontrolled anthropogenic activities are affecting the allied biodiversity of the riparian zones [26]. Therefore, information on composition, diversity of tree species and species-rich communities is of primary importance in the planning and implementation of biodiversity conservation efforts [21]. There are several uses of trees to man. Early humans depended on natural woodlands for foods such as fruit and nuts [27]. Systematic planning of street trees for timber production is widely practiced in China and Malaysia [28]. Timber and latex from different species of trees are used to satisfy different human needs [29]. In many developing countries large parts of the urban population are dependent upon fuel wood [30]. Trees fulfill certain physiological, social and cultural needs of urban dwellers. The present study indicated that the Pazhayar river basin is not only rich in its habitats and habit forms but also for the diverse life forms. The diverse habitat of the river bank supports a rich flora and fauna. Diversity of the rare endemic and threatened species are comparatively poor in this region. These areas are under severe threat due to various man-made reasons like forest fragmentation, agriculture land conversion, construction of check-dams, over – exploitation of plant resources, monoculture of trees, unscientific application of chemicals, encroachment [31]. All these facts indicate the immediate need of implementing conservation measures to maintain the species diversity which is our national heritage, and to save the valuable genetic resources for sustainable utilization of the posterity. Hence apart from medicinal uses, the trees are useful for various other purposes, so conservation of tree species is very much essential for future generation.

4. CONCLUSION

It can be concluded that the local and traditional healers of the nearby areas of Pazhayar River have very good knowledge on the use of medicinal plants. But such knowledge of medicinal plants is restricted to a few persons in rural areas. Therefore it is necessary that suitable requirements are needed for plant utilization and was found that traditional ethno medicine still persists among the local and traditional healers in nearby areas of Pazhayar river of Kanyakumari District.

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CONFLICT OF INTEREST

Authors have no any conflict of interest.

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