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An Ethnobotanical Survey on Medicinal Plants used to treat Urinary Tract Infections in Kanyakumari District

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ABSTRACT

This study is an attempt made to explore the indigenous knowledge of medicinal flora used to treat urinary tract infections in Kanyakumari district, Tamil Nadu, India. The information was collected by intensively interviewing the indigenous people, experienced aged rural folks, traditional healers and herbal drug sellers of Kanyakumari district. A total of 29 medicinal plants belonging to 21 families were identified to be used as curative agents against urinary tract infections by dwellers of Kanyakumari district. The medicinal plants were arranged alphabetically based on its botanical name and other details such as local names in Tamil, family name, plant part used, method of preparation and route of administration were recorded. The indigenous knowledge obtained through this survey might aid the scientific community to investigate these plants for discovery of bioactive compounds that could serve as curative agents against urinary tract infections in future.

Keywords: Kanyakumari, Indigenous knowledge, Urinary tract infections, Medicinal flora.

INTRODUCTION

Plants have deeply influenced the culture and evolution of human beings residing in all the geographical regions of the world [1]. According to the World Health Organization (WHO), owing to poverty and insufficiency or absence of access to modern medicine, about 65-80% of the world's population in developing countries relies on plants essentially for their primary healthcare [2]. Traditional system of herbal medicine utilizes cultural knowledge and practices for the maintenance of human health. This knowledge on medicinal plants is passed verbally from one generation to other and is still maintained by various indigenous groups. Hence, there is a necessity to document this knowledge of traditional medicinal plant practice for the discovery and development of drugs in future [3,4].

Here lies the significance of Ethnobotany, which can be defined as the total natural and traditional relationship and the interactions between man and his surrounding plant wealth [1]. The ethnobotany of a specific area is an extremely complicated or elaborate process [5]. In recent years, the use of ethnobotanical information in medicinal plant research has gained considerable attention among scientists [6]. The increasing expenses of prescription drugs for the maintenance of personal health and the bioprospecting of novel plant derived drugs fuelled the interest in medicinal plants [7]. Therefore, ethnomedicinal studies can be considered as an appropriate and reliable source of information on valuable medicinal plants that can be targeted to discover natural and synthetic drugs [8].

Ethnobotanical knowledge on medicinal plants from different parts of India has been documented [5,9-11]. Ethnobotanical value of medicinal plants possessed by various tribals and rural communities were studied to a certain extent only in Tamil Nadu [12-15]. Scrutiny of these reports put forward the fact that the ethnobotanical knowledge on medicinal plants used to treat urinary tract infections in Tamil Nadu is inadequate, especially in Kanyakumari district is found to be sparse.

Hence, this study was conducted to explore the indigenous knowledge of medicinal flora used to treat urinary tract infections from folks residing in Kanyakumari district.

MATERIALS AND METHODS

Data Collection:

The ethno botanical investigation was carried out for a period of four months from September 2018 to December 2018. The information was collected from the indigenous people, experienced aged rural folks, traditional healers and herbal drug sellers of Kanyakumari district. A field data book was prepared to record the data on medicinal plants collected during the survey. A total of 80 informants were interviewed intensively and the data obtained regarding their knowledge on ethno medicinal uses of

plants along with their common names, morphology, parts used and dosage were recorded in the data sheet. The medicinal property of each plant was accepted as valid if at least five separate informants had a similar opinion. The morphology and medicinal uses of the plants were checked using the literature available [11-13].

Study Area

The study area Kanyakumari district represents the southernmost tip of India. Geographically, the district lies between 77°15' and 77°36' of the eastern longitudes and 8°03' and 8°35' of the northern latitudes. It is situated in the foot hills of southern Western Ghats and covers an area of about 1684 sq. km, which is 1.29 percent of the total

geographical area of the state Tamil Nadu, India. The district is bound by Tirunelveli District on the North-East, Kerala on the North-West, Bay of Bengal in the South-East, Arabian Sea in the South-West and Indian Ocean in the South. The annual rainfall ranges from 103 cms to 310 cms and the altitude is 1829 meters above mean sea level. The district has a moderately humid climate. Topographically the district can be classified as mountainous region, middle region and coastal region. Due to diverse nature of landscape, the district is rich with fourteen types of forests that include tropical wet evergreen to thorn forests. The district is inhabited by Tamil and Malayalam speaking people. The main foods of the people are rice, tapioca, tea, coffee, palm sugar, etc. [12,16-18]. The location map of the study area, Kanyakumari district was illustrated in figure 1.

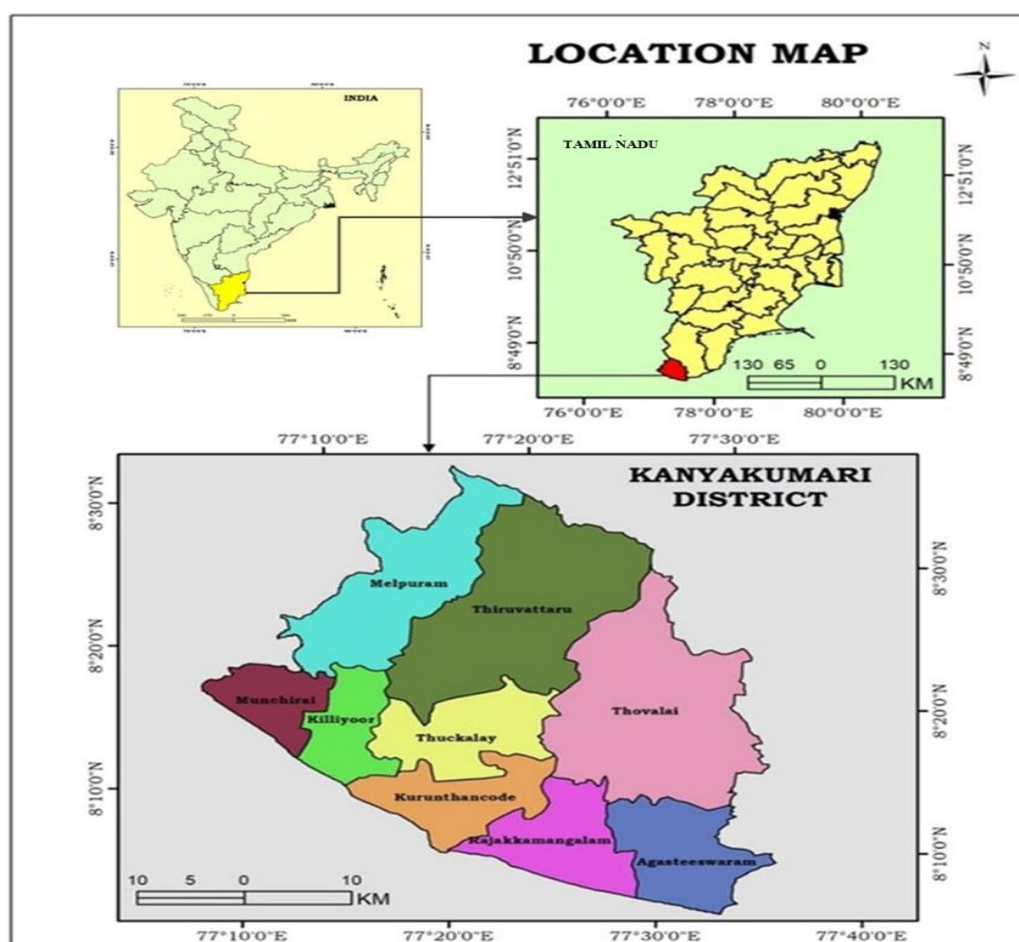


Figure 1: Location Map of the Study Area

RESULT AND DISCUSSION

The traditional healers and indigenous elder people in Kanyakumari district possess rich knowledge on medicinal flora for curing various ailments. They believed this knowledge on herbal medicine as sacred enigmas and were reluctant to share. Only a few of them shared their traditional herbal knowledge after understanding the rationale of the study. The observation of this study revealed that traditional medicine plays a significant role in the life of rural folks residing in Kanyakumari district.

During the study, a total of 29 species of plants used against urinary tract infections by the traditional healers and rural folks residing in this district were identified. The plant species identified during the

study were *Aerva lanata*, *Amaranthus viridis*, *Annona squamosa*, *Asparagus racemosus*, *Boerhavia diffusa*, *Borassus flabellifer*, *Canthium parviflorum*, *Centella asiatica*, *Clitoria ternata*, *Cocos nucifera*, *Coleus aromaticus*, *Coriandrum sativum*, *Cucumis sativus*, *Cuminum cyminum*, *Curculigo orchioides*, *Curcuma angustifolia*, *Cynodon dactylon*, *Hemidesmus indicus*, *Hordeum vulgare*, *Mangifera indica*, *Mimosa pudica*, *Moringa oleifera*, *Musa paradisiaca*, *Phyllanthus emblica*, *Saraca asoca*, *Scoparia dulcis*, *Tribulus terrestris*, *Vetiveria zizanioides* and *Zingiber officinale*.

The medicinal plants identified through the survey were arranged in alphabetical order based on its botanical names along with family name, local names in Tamil, plant part used, method of preparation and route of administration in table 1.

Table 1: Usage of medicinal plants against Urinary Tract Infections in Kanyakumari district

Sl. No.	Botanical name with family	Tamil name	Plant part used, Mode of preparation and Route of administration
1.	<i>Aerva lanata</i> (Amaranthaceae)	Sirupoolai	Leaves are soaked in water overnight and the extract is filtered. About 100 ml of the filtrate is consumed orally once in a day for 5 days.
2.	<i>Amaranthus viridis</i> (Amaranthaceae)	Kuppaikkirai	Water boiled with leaves and filtered. 100 ml of the filtrate consumed 3 times daily for 3 days.
3.	<i>Annona squamosa</i> (Annonaceae)	Seethapazham	50 ml of decoction of leaves is consumed orally twice daily for 7 days.
4.	<i>Asparagus racemosus</i> (Asparagaceae)	Shimaishadavari	5 gm of root powder mixed in goat's milk is consumed orally once in a day for one month.
5.	<i>Boerhavia diffusa</i> (Nyctaginaceae)	Mukaratee-kirai	5 drops of honey added to 10 ml of decoction of the whole plant and taken orally once in a day for 7 days.
6.	<i>Borassus flabellifer</i> (Arecaceae)	Nonkuppanai	Juice of ripe fruits mixed with sugarcane juice is consumed orally, till cure.
7.	<i>Canthium parviflorum</i> (Rubiaceae)	Mullukaarai	Leaves cooked with rice flour and palm jaggery is taken internally for one week.
8.	<i>Centella asiatica</i> (Apiaceae)	Vallarai	50 ml of leaf juice was consumed orally in empty stomach for 7 days.
9.	<i>Clitoria tematea</i> (Fabaceae)	Sankupuspan	5 gms of dried root powder mixed in rice water and consumed orally one month.
10.	<i>Cocos nucifera</i> (Arecaceae)	Tennai	Tender coconut added with cardamom, kept undisturbed overnight and drinks it in empty stomach for 3 days.
11.	<i>Coleus aromaticus</i> (Lamiaceae)	Karpooravalli	50 ml of juice of leaves taken orally once in a day for one week.
12.	<i>Coriandrum sativum</i> (Apiaceae)	Kothamali	Water boiled with seeds and consumed as much as the patient could, till cure.
13.	<i>Cucumis sativus</i> (Cucurbitaceae)	Vellari	Grind ten seeds with little rock salt and consume the paste twice daily for 5 days.
14.	<i>Cuminum cyminum</i> (Apiaceae)	Jeerakam	Water boiled with seeds and consumed as much as the patient could, till cure.
15.	<i>Curculigo orchioides</i> (Amaryllidaceae)	Nilapanai	10 gms of root powder mixed in cow's milk is consumed two times daily for 7 days.
16.	<i>Curcuma angustifolia</i> (Zingiberaceae)	Araukizhangu	5 gms of root powder mixed with cow's milk is consumed two times daily for 7 days.
17.	<i>Cynodon dactylon</i> (Poaceae)	Aruvaumpullu	10 ml of leaf juice is consumed orally in empty stomach for 5 days.
18.	<i>Hemidesmus indicus</i> (Asclepiadaceae)	Nannari	Root powder mixed with cow's milk is consumed orally twice daily for 7 days.
19.	<i>Hordeum vulgare</i> (Poaceae)	Barliarisi	Grains soaked in water overnight, boiled and drink as much as, till cure.
20.	<i>Mangifera indica</i> (Anacardiaceae)	Maa	Drink 500 ml of well water after chewing seven leaves.
21.	<i>Mimosa pudica</i> (Fabaceae)	Thottalchinungi	50 ml of decoction of leaves is consumed orally in empty stomach for 3 days.
22.	<i>Moringa oleifera</i> (Moringaceae)	Morigkai	Water boiled with leaves and consumed as much as, till cure.
23.	<i>Musa paradisiaca</i> (Musaceae)	Vaazha	20 ml of stem juice consumed twice daily for three months.
24.	<i>Phyllanthus emblica</i> (Phyllanthaceae)	Nelli	Fruit juice mixed with honey is orally consumed twice daily, till cure.
25.	<i>Saraca asoca</i> (Caesalpinaceae)	Asogam	Seed powder is added to tender coconut and consumed three times daily.
26.	<i>Scoparia dulcis</i> (Plantaginaceae)	Kallurukki	Fresh juice of leaves is consumed in empty stomach, till cure.
27.	<i>Tribulus terrestris</i> (Zygophyllaceae)	Nerunji	Juice prepared by mixing fruit powder with honey and milk, drink 100 ml of this juice for one week.
28.	<i>Vetiveria zizanioides</i> (Poaceae)	Vattiver	Roots soaked in water, boiled and drink as much as, till cure.
29.	<i>Zingiber officinale</i> (Zingiberaceae)	Inji	2 gms of root powder added to 500 ml of water and consumed at night for 15 days.

From the study, it can be observed that medicinal flora play a vital role in the lives of indigenous population of the district. Habit wise analysis of the data revealed the dominance of herbs, followed by shrubs, grasses, trees, climbers and creeper. Family wise analysis of the data showed the dominance of *Poaceae* and *Apiaceae* family with 3 species, followed by families like *Amaranthaceae*, *Arecaceae*, *Fabaceae* and *Zingiberaceae* with 2 species and other families like *Amaryllidaceae*, *Anacardiaceae*, *Annonaceae*, *Asclepiadaceae*, *Asparagaceae*, *Caesalpinaceae*, *Cucurbitaceae*, *Lamiaceae*, *Moringaceae*, *Musaceae*, *Nyctaginaceae*, *Phyllanthaceae*, *Plantaginaceae*, *Rubiaceae* and *Zygophyllaceae* represented with single species.

Apart from UTI, these plants were also used in treating respiratory system disorders, digestive system disorders, sex related problems, gynaecological problems, etc. The whole plant or parts like root, stem, bark, leaves, fruits and seeds were used to prepare decoction, powder or paste form of medicines. The plant parts were used either as fresh or as dried material for preparing herbal formulations. The plants were utilized either singly or in combination with other ingredients like milk, honey, jaggery, etc for curing urinary tract infections. Most of the medicinal preparations were used as liquid forms during administration.

Generally, the rural folks have strong belief on traditional healers and they in turn prescribed herbal medicines without any scientific validation for urinary tract infections. Based on experiences from patients, they validated the efficacy and success of drugs. Most of the people avoid visiting an allopathic doctor for treatment of urinary tract infections, because of their shyness to discuss about this infection with unknown physicians and being anxious about expenses of modern medicines.

CONCLUSION

From the study, it can be observed that numerous medicinal plants were used for treatment of urinary tract infections in Kanyakumari district. Based on severity and symptoms reported by victims, traditional healers prescribed the plants and its dosage. Hence it is necessary to investigate and document these plants to understand the basis of medicinal value of these plants by adopting modern scientific methods that may lead to the discovery of novel drugs with safety and efficacy. Moreover, this study will help to preserve the traditional knowledge on herbs, conserve the plants from extinction and provide income to the rural folks by cultivation of plants with medicinal value.

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Conflict of Interest

The authors declare that they have no conflict of interest.

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