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## Ethnobotanical survey of Diuretic and Antilithiatic medicinal plants used by the traditional practitioners of Palakkad District.

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### ABSTRACT

The traditional wisdom about the plant wealth is a vibrant and valuable aspect of ethnobotany. The art of herbal healing has been as a part of Indian culture since antiquity. A wide range of plants or plant based products used by traditional healers have shown to be effective due to synergism of their diuretic, crystallization inhibition activity along with stone disintegrating property. Present floristic survey undertaken to document the claims of local healers about the hidden treasure of Antilithiatic herbal knowledge in the study area. The study enumerated thirty potential Antilithiatic plants which are reported to be effective for its diuretic and Antilithiatic property by them. The field survey also revealed that both the herbal knowledge and the plant wealth are on the verge of extinction.

**Keywords:** Ethnobotany, Diuretic & Antilithiatic medicinal plants, Traditional practitioners, Palakkad

### 1. Introduction

The traditional wisdom about the plant wealth is a vibrant and valuable aspect of Ethnobotany. The art of herbal healing has been evolved as a part of Indian culture since antiquity. The ethnobotanical practices in India provide a spectrum of variation such as Ayurvedha, Unani and Sidha. Parallel to the development of these classical systems of medicine, folk or tribal medicines are also flourished in the rural and tribal habitats. But as the time went on, and those healers who practiced the theorized and codified system were considered superior to those who practiced the folk methods of healing. There are large numbers of folk or tribal practitioners across India who was neglected a lot without patronage because of their illiteracy and low social status. As a result substantial amount of these traditional knowledge were swept away into oblivion <sup>[1]</sup>. Loss of traditional knowledge is recognized as of great global concern in the present Century <sup>[2]</sup>. However in the recent past, Local Health Tradition with all its material knowledge and acquired wisdom have been gained acceptance in the domains of Health Care Practices as well as global intellectual property regimes. Furthermore, the toxicity and adverse reactions of allopathic medicines, has led to increased resurgence of public interest towards the herbal lore of native healers. Hence, the need for documentation of traditional knowledge on medicinal plants and further scientific investigations are significant to develop more trust and faith towards this potential wisdom. A mechanism with high potential for protection of traditional knowledge is its documentation in databases and registers <sup>[3]</sup>. Here, the present study is significant in this direction to capturing information on diuretic and antilithiatic floral wealth of rural and tribal areas of Palakkad district.

Urolithiasis or Nephrolithiasis is a common urological disorder since ancient time and also a significant problem because of its worldwide prevalence, increased recurrent rate and severe consequences. This condition is caused when the urine becomes so saturated with certain undissolved minerals. Which then forms crystals, clump together and grow into hard stones anywhere in the urinary tract, usually in the kidneys. The problem of stone formation is considered as a medical challenge due to its multifactorial etiology and high rate of reoccurrence <sup>[4]</sup>. Various therapies including thiazide diuretics and alkali-citrate are being used in attempt to prevent recurrence of hypercalciuria and hyperoxaluria induced calculi but scientific evidence for their efficacy is less convincing <sup>[5]</sup>. Minimally invasive surgery has revolutionized acute and complex stone management, but it has not reduced recurrence rates because less invasive therapies, including extracorporeal shockwave lithotripsy (ESWL), often result in incomplete stone clearance <sup>[6]</sup>.

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Various Plant drug have been employed during ages to manage urolithiasis. References prove that litholytic herbs for treatment of renal stones are used since ancient periods before inventing modern treatments [7]. Scientific studies are mostly focused on phytotherapy as it is proved to be vital in preventing reoccurrence of stones [8]. The active chemical constituents of these plants promote the expulsion of urine as well as disintegrating stone particles. Many more plant species are still there to be explored in the traditional herbal practices of folk and tribal healers. This necessitates a need for documenting the herbal lore of these practitioners about diuretic and antilithiatic medicinal plants of Palakkad district.

## 2. Materials and methods

### 2.1 Study Area

Palakkad is one of the districts in Kerala state of Southern India. The district is situated within the north latitude  $10^{\circ} 46'$  and  $10^{\circ} 59'$  and east longitude  $76^{\circ} 28'$  and  $76^{\circ} 39'$ . The district open the state through Palakkad Gap, a natural depression through the Western Ghats ranges that run

parallel to the West Coast of India and connects Kerala to the plains of the state of Tamil Nadu to the east (Fig: 1). The district has two natural division, the mid land and high land regions based on its physical features. The midland region is at an elevation ranges between 75-250 m and high land region has an elevation of more than 250 m. Palakkad is bestowed with the tributaries of Bharathapuzha which originates from the high lands of the district and flow throughout the district. Out of the total 4480 km<sup>2</sup> area of the district, 1360 km<sup>2</sup> of land is covered by forests. All these factors nurtures and supports the unique ecological and cultural diversity of the area. Besides the native communities, eight tribal groups are also living in and premises of forests. A significant percentage of the population are migrants from the nearby state of Tamil Nadu. The district is one of few places of Kerala state where remnants of Jainism have been survived without substantial cultural erosion. Because of this rich floristic and cultural diversity, the district being considered as a repository of wealthy traditional knowledge.



**Fig. 1:** Location Map of Study Area- Palakkad district, Kerala

### 2.2 Methodology

To record the folk and tribal knowledge on diuretic and antilithiatic medicinal plants, frequent visits were made to various remote localities including tribal settlements during the survey period. Data were collected according to the methodology suggested by Jain and Goel [9]. Information about medicinal plants were collected from the local medicine men of rural areas, experienced persons who practice phytomedicines and tribal healers using an unstructured interview. Details of plant drug, such as vernacular name of the plants, parts used, mode of preparation and administration were sought from them with the help of a questionnaire. Their claims were compared and then confirmed with the available literature on the use of diuretic and antilithiatic medicinal plants. Besides this, aged and experienced elderly knowledgeable men and women among rural folks and tribes were also consulted. Field trips were accompanied by local informants for identification and collection of plant species used in the study area. The voucher specimens of medicinal plants were collected with the help of farmers and other local people. The plant species mentioned by the informants were taxonomically identified using local flora [10].

The correctly identified voucher specimens are deposited in CMPR, Kottakkal.

## 3. Results & Discussion

Medicinal plants used in the treatment kidney stones by the traditional practitioners of Palakkad district are listed in Table 1. The plants are arranged in alphabetical order of their botanical names, family, Habit, vernacular names, parts used and a brief note on mode of preparation and administration. In this study, 30 plant species, belonging to 25 families have been recorded for its Antilithiatic activity. Out of the total plants 16 herbs, 5 Climbers, 4 trees, 4 shrubs and 1 lichen were identified. Whole plants as well as different parts of the plants viz. stems, leaves, roots, seeds and whole plants were used by the healers to treat kidney stone. Percentage analysis of plant parts used were shown as following, roots (33.3%), whole plant (23.3%), Leaves (16.6%), seeds (16.6%), stem/bark (6.6%), & fruits (6.6%) (Fig: 2). This figure indicates that most of the remedy for urinary stone were obtained from roots, followed by whole plants and then leaves. Mostly fresh juice and decoction of the medicinal plants are

used by the practitioners as a part of their treatment to kidney stone. Family Wise distribution analysis of the plants used by the tribal healers revealed that medicinal plant species were distributed across 25 families. This varied family distribution indicates that anti-lithiatic biological compounds are present widely in the flora of the study area. Habit wise distribution of medicinal plants indicates that most of the remedies are obtained from herbs. Many of these herbs was commonly seen in the backyard of village and homes, but now there are in the verge of extinction. The result of the present work necessitates the conservation of this herbal wealth. Most of the reported

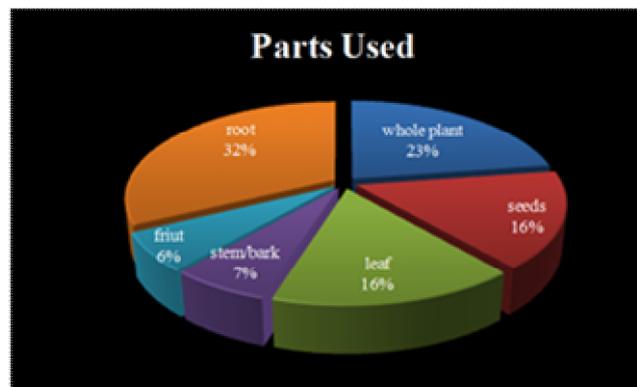
plants are used as single drug for treating kidney stones. Only a few medicinal plants are used as combinations. The most frequently used preparations were fresh juice and decoctions. Methods of preparation and mode of administration are varied slightly for each herbal practitioner. Especially, each tribal group has been following different methods of preparation and mode of administration for the same drug. Some of these plants have been reported earlier, being used in anti-urolithiatic and lithontriptic preparation from different parts of the country<sup>[11]</sup>.

### 3.1 Tables and Figures

**Table 1:** Diuretic and Antilithiatic medicinal plants

SI no.	Plant Species & Family	Habit	Vernacular name	Parts Used	Mode of Use and property
1	<i>Achyranthes aspera</i> L. Amaranthaceae	H	Kadaladi	Whole plant	Decoction is used as Diuretic and to expel stone particles.
2	<i>Aerva lanata</i> (L.) Amaranthaceae	H	Cherula	Whole plant	Decoction of whole plant is used twice a day.
3	<i>Amaranthus spinosus</i> L. Amaranthaceae	H	Mullucheera	Roots	Decoction of the roots is used daily for a period of 2-3 weeks. The whole plant is used as raw vegetable.
4	<i>Anacardium occidentale</i> L. Anacardiaceae	T	Kashumaavu	Tender leaves	Paste of tender leaves and cumin seed mixed in coconut water is taken orally to expel stones
5	<i>Asparagus racemosus</i> Willd. Liliaceae	C	Sathavari	Root Tuber	Decoction of the tuber is used daily to dissolve stones.
6	<i>Benincasa hispida</i> (Thunb.) Cucurbitaceae	C	Kumbalam	Fruit	Fruit juice is taken orally daily to expel kidney stone
7	<i>Boerhavia diffusa</i> L. Nyctaginaceae	H	Thazhuthama	Whole plant	Decoction of the plant given daily for 2-3 weeks to expel stone particles
8	<i>Bryophyllum pinnata</i> Lam. Crassulaceae	H	Elamulachi	Leaves	Leave juice dissolves stones & increase urination and expel stone particle.
9	<i>Crataeva magna</i> (LOUR.) Capparaceae	T	Neermathalam	Fruit	Fruit juice is taken orally to disintegrate stone
10	<i>Cucumis melo</i> L. Cucurbitaceae	C	Vellaikai	Seeds	Powder of seeds are taken with milk to dissolve stones
11	<i>Cyperus rotundus</i> L. Cyperaceae	H	Muthanga	Tubers	Tubers are used for making decoction and taken orally for dissolving stones.
12	<i>Ensete superbum</i> Rox. Musaceae	S	Kalluvazhai	Seeds	Dried seeds powdered and mixed with goat milk and taken orally to kidney stone.
13	<i>Homonoia riparia</i> Lour. Euphorbiaceae	s	Neervanchi	Roots	Fresh juice of root is given twice a day to expel stones.
14	<i>Hygrophila schulli</i> Buch.-Ham. Acanthaceae	H	Vayalchulli	Whole plant	Decoction of the whole plant is given orally.
15	<i>Ichnocarpus frutescens</i> L. Apocynaceae	C	Palvalli	Root	Root decoction is given orally to expel stones.
16	<i>Mimosa pudica</i> L. Mimosaceae	H	Thottavaadi	Root	Fresh root juice is used daily for 2 weeks
17	<i>Moringa oleifera</i> Bedd. Moringaceae	T	Muringa	Root & bark	Root and bark juice is given orally to dissolve stones
18	<i>Musa paradisiaca</i> L. Musaceae	H	Vazha	Puttable stem	Fresh juice is taken orally to dissolve and expel stone particle
19	<i>Ocimum sanctum</i> L. Lamiaceae	S	Thulsi	Leaves	Fresh leaf juice is taken orally to expel stone particles
20	<i>Parmelia perlata</i> Parmeliaceae	L	Kalpoovu	Whole plant	Powder of Dried thallus is used with goat milk
21	<i>Pedaliium murex</i> L. Pedaliaceae	H	Aananjerinjil	Seeds	Decoctions of the seeds/water boiled with seeds are used daily.
22	<i>Phyllanthus niruri</i> L. Euphorbiaceae	H	Keezharnelli	Whole plant	Leaf juice is used as stone breaker
23	<i>Portulaca oleracea</i> L.	H	kozhuppa	Whole	Fresh Juice of whole plant is given to increase urine

	Portulacaceae			plant	volume and dissolving stones.
24	<i>Rotula aquatica</i> Lour. Boraginaceae	S	kalloorvanji	Root	Root decoction is taken to dissolving and expelling stones.
25	<i>Scoparia dulcis</i> L. Scrophulariaceae	H	Kallurukki	Leaves	Fresh Leaf juice is orally given for kidney stone
26	<i>Solanum virginianum</i> L. Solanaceae	H	Kandakarichunda	Root	Decoction of the root is used for disintegrating stone particles.
27	<i>Sphaeranthus indicus</i> L. Asteraceae	H	Adakkyamaniyan	Roots	Decoction of roots taken orally to reduce stone size and for increasing urine
28	<i>Strychnos potatorum</i> L.f. Loganiaceae	T	Thettamparel	Seeds	Decoction of seeds /water boiled with seeds is used to increase urine discharge and stone disintegration.
29	<i>Tinospora cordifolia</i> Willd. Menispermaceae	C	Chitamruthu	Leaves & stems	Fresh juice of leaves and stems are taken orally to dissolve kidney stone.
30	<i>Tribulus terrestris</i> L. Zygophyllaceae	H	Njerinjil	Seeds	Decoction of dried seeds is used for diuretic and antilithiatic activity.



**Fig 2:** Percentage distribution of Antilithiatic remedies obtained from different parts of the plant

#### 4. Conclusions

The present study reveals the information about the treasure trove of medicinal plants with Antilithiatic property used by the traditional practitioners of Palakkad district. As evident from the above survey and informant's data, there are effective remedies for the treatment of urolithiasis in the traditional practices of herbal healing. These herbal medicines are claimed to be more effective than other available treatments, with lesser side effects, economic nature and no risk reoccurrence. However further research is needed to identify active principles from these medicinal plants to assess their dosage and quality control, their interactions and adverse effects.

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