

## Ethnobotanical Survey of Plants used in Treatment of Urinary disorders in Dhenkanal district of Odisha, India

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**Abstract :** The tribal population of Dhenkanal district has traditionally depended on folk medicinal healers for treatment of their ailments. These tribal healers use medicinal plants as their primary source of medicinal formulations. Various tribal rich forest pockets of the district were identified and field trips were conducted at regular intervals in different seasons. Tribal uses of plants were studied in situ by establishing close intimacy with the tribal healers. During the survey 315 plant species belonging to 295 genera and 75 families have been collected, critically studied, identified and incorporated in the Herbarium. But UTIs-related ethno-medicinal data when analyzed was found to be from 26 species. Though 265 ethnobotanical notings were made from 25 tribes of the district during the present field work, only 26 are found to be interesting and useful against urinary tract infections or related diseases. The rest were deleted due to various unclassified reasons like wrong attribution, wrong identification, misinterpretation, non-confirmation in the cross-checking, mounted on baseless faiths etc. It can be concluded that ethnobotanical plants can be used to discover natural products that may serve as lead for the development of new pharmaceuticals addressing the major therapeutic needs.

**Keyword:** Dhenkanal, Ethnobotanical, Healers, Herbarium, Pharmaceutical, Urinary tract infections

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### I. Introduction

Diseases and other related ailments are predictable in life and have led man to find out ways by which they could be treated. Plants have always been a successful resource of therapy from nature. Such practice is as old as human existence and forms an integral part of traditional medicine. The term medicinal is applied to a plant indicates that it possesses a substance or substances which alter beneficially the physiology of sick mammals and that it has been used by man for that purpose [1].

Urinary tract infections (UTIs) are one of the most common types of infection in the body, accounting for about 8.1 million visits to health care providers each year. Women are particularly prone to UTIs for anatomical reasons. One factor is that a woman's urethra is shorter, allowing bacteria easy and quicker access to the bladder. Also, a woman's urethral opening is in close proximity to sources of bacteria from the anus and vagina [2]. For women, the lifetime risk of having a UTI is greater than 50 percent [3]. Urinary tract infections in men are not as frequent as in women but can be severe when they occur. More than 95% of UTIs are caused by the only bacterial species *E. coli* which is the most commonly infecting organisms [4]. However, many other bacteria including *Klebsiella*, *Pseudomonas*, *Enterobacter*, *Proteus*, *Staphylococcus*, *Mycoplasma*, *Chlamydia*, *Serratia* and *Neisseria* spp. can also cause an infection. It is reported that about 35% of healthy women suffer symptoms of Urinary tract infections and about 5% of women each year suffer with the problem of frequent and painful urination (dysuria) [5].

Modern health care system has no accessibility to the interior and remote areas, furthermore, it's not affordable by the poor and tribal communities, and hence, poor rural community still depend upon traditional health care system, which is easily and locally available with minimum side effects. The traditional use of medicinal plants for primary healthcare has been specially significant as, the herbal medicines from the closest nature are not only easily accessible and immediately available, but also, most effective, dependable and curative. Historical evidence of the use of traditional herbal medicines for the primary health care indicate that, there have been synergistic relation between the herbal medicines and health care in natural areas, which over the last few decades has faded because of some socio-economic and cultural changes in the social set up and use of modern medicines has increased phenomenally.

Forest plays a vital role in enhancing livelihood requirements for rural community and in maintaining ecological balance. Over 53 million tribal people in India belong to 550 communities of 227 ethnic groups [6-8] and about 60% of the rural populations directly rely on forest for their day-to-day requirement. The forest products, mostly the non-timber forest products are being utilized for primary health care, not only by the tribal people, but also by the other rural communities. Hence, it needs proper documentation. Documentation is not the limit for exploring the particular area in search of folklore claim of tribes in relation to health care, but the plants must be evaluated properly to test its authenticity. Thus, the present study was aimed to document the

availability, consumption and management of forest products in relation to primary healthcare especially Urinary Tract infections among different tribal communities in Dhenkanal district of Odisha, India.

## II. Materials And Methods

### 2.1 Study area

Dhenkanal is a landlocked district of Odisha with a total geographical coverage of 4595 Sq. Km. (Fig.1). The district is one of the centrally located districts in Odisha lying between Longitude 85° 58' to 86° 20' East and Latitude 20° 29' to 21° 11' North and bounded by the Keonjhar district at north, Cuttack district at south, Jajpur at the east and Angul in the west. The Climate of the Dhenkanal district is hot and dry sub-humid type with an average annual rainfall of 1696 mm. The average minimum and maximum temperatures are 19.6 °C and 33.3 °C respectively. The relative humidity generally varies from 31 to 88%. Out of the total coverage of 4595 Sq. Km. of the district, a major part comprising of 1737.62 Sq. Km. includes forest area which is scattered throughout the district. The principal species is *Shorea robusta* with other associates mostly bamboos. Monsoon generally commences from second week of June every year. The rainfall during June to December constitutes at least 75% of the annual rainfall of the district. On an average there are 73 rainy days in a year in the district.



**Fig. 1:** Map of Dhenkanal district of Odisha.

### 2.2 Field Survey

Various tribal rich forest pockets of the district were identified and field trips were conducted at regular intervals in different seasons. Tribal uses of plants were studied *in situ* by establishing close intimacy with the tribal healers. Care was taken to prioritize vulnerable areas for immediate attention especially forest pockets which are under intensive mining activity. Folklore claims were documented along with voucher specimens. As different species come to flowering and fruiting at different seasons, field surveys were executed in such a way as to accommodate relevant information in different stages of their life history.

### 2.3 Data Recording

The detailed information about the plants, dosages, duration, method of preparation, mode of administration, precautions to be taken etc. was recorded. The folklore claims as revealed by the practitioner in colloquial languages were recorded in the tape recorder. Wherever difficulties were encountered in

understanding the language, the tapes were replayed before the tribal chief and the correct meaning were translated.

#### 2.4 Plant Collection and Herbarium Studies

The supportive plant specimens of folklore claims were collected, processed, critically studied, identified and preserved in the Herbarium. Different Herbaria of Bhubaneswar that held the specimens of earlier workers were visited and checked their identity. Voucher specimens were identified by referring standard local floras [10].

#### 2.5 Cris-Cross Checking

An effort was made to cross check the folklore claims. This study involved checking and rechecking of particular folklore claims by the different dwellers of the same tribe in different forest pockets. This has cleared many doubts regarding the use and identity of plant specimens.

#### 2.6 Local Names

Vernacular names in vogue in the different tribal languages and Odia were given.

#### 2.7 Ethnobotanical Notings

A brief but crisp note about the uses of the plants by the local inhabitants is given. Every care is taken to avoid ambiguity as regards to plant part, quantity, dosage, method of preparation, mode of administration of the drug or drugs.

### III. Observations and Discussion

As a result of intensive and extensive medico-ethnobotanical field explorations and interactions with tribal healers, village medicine-men, herb sellers and senior knowledgeable persons who practice native phytotherapy in Dhenkanal district of Odisha for nearly two years, it became possible to generate enormous amount of data. After identifying the plant specimens in the Herbarium and scrutinizing the data, it was found that the information is quite interesting and worth pursuing for their efficacy. The data when cross checked with the published literatures [11-43] it was found a good number of plants used against Urinary Tract Infections (UTIs) or urinary disorders are either less known or not recorded earlier.

During the survey 315 species belonging to 295 genera and 75 families have been collected, critically studied, identified and incorporated in the Herbarium. But UTI-related ethno-medicinal data when analyzed was found to be from 26 species only (Table 1). In dealing with plants especially for medicinal uses, it is of foremost importance that the plant in question (i.e. nomenclaturally confusing or problematic herbal drugs) must first of all be correctly determined. Inaccuracy in the determination might bring failure to obtain desired results in the patient and it might sometimes lead to the death of the patient by producing undesirable or poisonous effects. Much of our failures to cure various types of ailments are principally due to faulty administration of wrongly identified plants.

Though 265 ethnomedicinal notings were made from 25 different tribes during the present field work, only 26 are found to be interesting and widely used against urinary tract infections or related diseases. The rest were deleted due to various unclassified reasons like wrong attribution, wrong identification, misinterpretation, non-confirmation in the cris-cross checking, mounted on baseless faiths etc.

**Table 1: Plants used in the treatment of urinary disorders in Dhenkasnal district of Odisha**

Sl. No.	Plant name	Family	Local name	Mode of uses
1	<i>Abutilon indicum</i> (L.) Sweet	Malvaceae	Pediapedika	Leaves ground with butter milk and the extract is given to cure urethritis.
2	<i>Aerva lanata</i> (L.) Juss. ex Sch.	Amaranthaceae	Lopong arak	Root paste (5 g) or decoction of the whole plant (10-15 ml) is given two times a day for 10 days against dysuria. Decoction of leaves and tender shoots is taken for clearing the stones in kidney and also in urinary bladder.
3	<i>Areca catechu</i> L.	Arecaceae	Gua	The decoction of nuts (15 g) mixed with 5 g of old jaggery is given once daily for 10-20 days to correct urinary disorder and nervous system disorder.
4	<i>Asparagus racemosus</i> Willd.	Liliaceae	Kedar nari	Tuberous root powder (5 g) mixed with 10 g of sugar candy is given to the patient once in a day for one month against blood-urine or related urinary trouble.
5	<i>Bauhinia variegata</i> L.	Caesalpiniaceae	Jantai	Equal quantities of fresh bark of this plant and roots of 'satavari' ( <i>Asparagus racemosus</i> ) pounded and given (15 g) with cow's milk against dysuria and in gall bladder stone.

6	<i>Boerhavia diffusa</i> L.	Nyctaginaceae	Kenchu	The decoction (10 ml) of the whole plant with 4-5 drops of honey is given to cure dysuria. The patient is also advised to eat the leaves and tender branch tips as vegetables.
7	<i>Bombax ceiba</i> L.	Malvaceae	Leka	Fruit paste (5 g) is given along with decoction of 50 g of 'Kullattha' ( <i>Dolichous biflorus</i> ) to the patient once in a day early in the morning on empty stomach against calculous affections and ulceration of kidneys.
8	<i>Commiphora mukul</i> (Hook. ex Stocks) Engl.	Burseraceae	Guggula	The resinous gum (2 g) in hot water is given to the patient for one month to cure the diseases related to urinary tract infection.
9	<i>Cucumis sativus</i> L.	Cucurbitaceae	Kakudi	About 10-15 seeds ground with a little rock salt given twice a day for five days against urinary infection.
10	<i>Curculigo orchioides</i> Gaertn.	Hypoxidaceae	Tarmuli	Root or rhizome paste (10 g) with fermented rice water is recommended two times daily for seven days against urinary tract infection.
11	<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	Dhobi ghas	Five leaves are pestled with seven leaves of 'Barakoli' ( <i>Ziziphus mauritiana</i> ), seven grains of raw rice and a mixture is prepared by adding 250 ml water to it. This preparation is given to cure dysuria.
12	<i>Desmostachya bipinnata</i> (L.) Stapf.	Poaceae	Kasui	Decoction of roots (20 g) with little honey given thrice a day for 3 days to cure any type of urinary troubles.
13	<i>Hybanthus enneaspermus</i> (L.) F.v. Muell	Violaceae	Tandisol	10 g of roots ground with 3 black peppers ( <i>Piper nigrum</i> ) and 50 g sugar candy and the paste is given in the morning on empty stomach to rectify dysuria.
14	<i>Ichnocarpus frutescens</i> (L.) R.Br.	Apocynaceae	Saon lar	Fresh juice (10 ml) of leaf and fruit along with two 'black pepper' ( <i>Piper nigrum</i> ) seeds is given early in the morning in empty stomach to cure dysuria.
15	<i>Kalanchoe pinnata</i> (Lam.)Pers.	Crassulaceae	Hemakedara	One leaf with 2 black peppers ( <i>Piper nigrum</i> ) are made in to a paste and given twice a day after meals in the morning and evening against kidney stone.
16	<i>Mangifera indica</i> L.	Anacardiaceae	Uli	Seven petioles of the leaves are chewed completely followed by drinking 500 ml of well-water to cure dysuria accompanied by pain and burning.
17	<i>Phyllanthus emblica</i> L.	Euphorbiaceae	Ener	Paste prepared from boiled fruits of this plant and the fruits of 'Haritaki' ( <i>Terminalia chebula</i> ) is given with 20 ml goat's milk twice daily one hour before food for 15 days or till the cure of urinary trouble.
18	<i>Phyllanthus fraternus</i> Webster	Euphorbiaceae	Bhuin aenla	Plant extract is given orally for 3-4 day to dissolve the stones and check burning urination.
19	<i>Pterocarpus santalinus</i> L.f.	Fabaceae	Rakta-chandana	Heartwood is rubbed on a piece of stone and the paste (about 5 g) given with a glass of water against genitor - urinary tract infection and polyuria.
20	<i>Solanum virginianum</i> L.	Solanaceae	Rangani janum	The juice of the root and honey in a proportion of 2:1 is administered orally to cure dysuria.
21	<i>Sphaeranthus indicus</i> L.	Asteraceae	Koirab	Whole plant is boiled with water and jaggery and stored in an earthen pot for about 15 days. The decoction is used against urinary tract infection and specially given to the mother of a new-born baby.
22	<i>Tinospora cordifolia</i> (Willd.) Hook f. & Thoms.	Menispermaceae	Gurach	Stem powder (10 g) of this plant and 2-3 g of 'black pepper' powder ( <i>Piper nigrum</i> ) are prescribed for 7 days to cure urinary tract infection.
23	<i>Tribulus terrestris</i> L.	Zygophyllaceae	Gokhru	Infusion (15 ml) of matured fruits is prescribed early in the morning in empty stomach to rectify the dysuria and other urinary troubles.
24	<i>Vetiveria zizanioides</i> (L.) Nash	Poaceae	Siron	Roots (100 g) boiled in 500 ml water for 30 minutes and the filtrate (10 ml) is given with little sugar to cure dysuria.
25	<i>Withania somnifera</i> (L.)Dunal	Solanaceae	Ashwagandha	Paste of roots (5 g) is given daily for seven days in empty stomach to cure dysuria.
26	<i>Zingiber officinale</i> Rosc.	Zingiberaceae	Sunthi	Half a tea-spoon of the rhizome powder with half litre of cold water is prescribed at night for 15 days to cure chronic dysuria. Half a tea-spoon of the rhizome powder with a half-boiled egg is prescribed at night for a month against abdominal pain.

#### IV. Conclusion

Urinary tract infections are widespread all over the world. Since most people, particularly in the underdeveloped countries do not go to allopathic physicians for treatment, either because they lack access to modern medical services or are too shy to discuss these diseases with unknown doctors. They rely primarily on traditional healers and medicinal plants of their environment for treatment of such diseases. Therefore, it is important to gather information from all parts of the world regarding medicinal plants that are being used in the treatment of these ailments. A number of plants used in Dhenkanal district of Odisha for treatment of UTIs are in use in other regions of the world for similar purposes. Thus, these plants have a basis to be investigated by modern scientific methods for possible discovery of new antimicrobial or other compounds. A direct result of the present investigation was that information on a number of plant species used to treat urinary tract infections have been collected that can form the basis for further scientific studies. A comparison of the present survey results with that of published scientific reports indicate that a number of the plant species have validity in their uses in traditional medicine.

#### Acknowledgements

The authors are grateful to the Head, Post Graduate Department of Botany, Utkal University, Bhubaneswar, Odisha, India for providing necessary facilities for the conduct of the present study. Authors are also indebted to large number of tribal or rural informants, who agreed to share valuable information on uses of medicinal plants growing in their surroundings.

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