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Ethnomedicinal plants used in kidney stones and infection of urinary tract by tribal community of Rayagada District, Odisha

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Abstract

The phytogeographical survey for ethno medicinal plants at Rayagada district of Odisha were conducted to evaluate sources of medicinal plants. The survey divulged from out of 30 distinct species of plant and its 20 families are worked as treatment of urinary tract and kidney stones in herbal remedies. All survey on ethno medicines is completely collected by interviews with herbalists, village healers, local baidyas and practicing herbal medicine practitioners. The old and famous facts are called "The garden is the poor man's apothecary " and cure of every disease is concealed in nature. Kidney stones and Urinary tract have suffered human beings since ancient times. These are an important causes of kidney failure in India. So, India has less mortality and more morbidity, but they are highly impacted by socioeconomically conditions. In present survey we have observed from extract of ethno medicinal plant parts are used to cure urinary tract and kidney stones complications. The detailed study to explore the ethno medicinal plant of Rayagada district, Odisha.

Keywords: Urinary tract; Kidney stone; Herbalists; Apothecary; Morbidity

1. Introduction:

Kidney stones and Urinary tract ailments have affected human beings since antiquity. Mishra et.al (2000) reported that most of rural and urban societies has been increasing by the occurrence of these kidney stone problems [1]. Most people in India suffers from kidney stones and Urinary tract because presence of Calcium, Oxalate and Phosphate. These chemicals are accumulating over a nucleus, which takes the shape of a stone. Zaidi et. al. (2006) represented that there is painful and highly necessary a proper cure of problems [2]. Ethno medicines are herbal substances that are used to treatment of different diseases [3]. Approximately 25 % of the drugs prescribed globally are originated from ethno medicinal plants [4]. There are found in various essential medicines in the World Health Organization (WHO), Out of 252 drugs, 11% medicines are originated from exclusively plant [5]. Traditional medicine, also called ethno medicines or phytomedicines because plant parts such as leaves, bark, root, flowers etc. used for medicinal purposes. Now-a-days, various experimenters are finding their research works on various ethno medicinal plant to create the products which are used in pharmaceutical industry [6]. Formation urinary calculi in the urinary tract are main characters for kidney stones. About 12 % of the population, approximately 47.60% females and 70-80 % in males are common affecting in kidney stones and urinary tracts disorders. The chemical of Urine that prevent the crystal from forming [7]. The diameter of urinary stone is up to 50 mm and are commonly passes through the urinary tract, but those people contains more than 7 mm diameter and requires for surgical intervention [8]. There are various causes related to health problems such as urination, severe pain at the end of Urinary tract obstruction and infection that unfavorably effects of individuals [9]. All age groups from less than 1 year old to more than 70 years people are affected by urolithiasis diseases. The stone formation is 2-4 times affected in men as compared to women because presence the large muscle mass of men but inhibiting capacity of oestrogen in stone formation and enhancing capacity of testosterone. Hence male

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urinary tract are overly complicated than female urinary tract. Hussain et. al. (1996) reported that calcium stones formation by protects citrate level and keeping urine alkaline is prevented by estrogen [10]. Calculi shows according to order of frequency sites in the urinary tract i.e., Urethral > Ureteral > Renal >Vesical. The positions of Calculi is found in the lower portions of the urinary tract in all age groups [11]. Narcotic analgesics and diuretics are synthetic drugs for treatment of kidney stones. The more use of drugs that results more affected by adverse reactions of drug. There are various treatment of approaches for Kidney stones such as percutaneous nephrostolithotomy, ureteroscopy, laparoscopic and shock wave lithotripsy [12]. Hence these treatment methods are non- convenient for patients because they are costly and painful. The herbal remedies and herbal medicine which are quite safe, cost effective, readily available, and minimal or no side effects, and easily affordable [13-15] People of Rayagada district is living in remote rural area, small village area and tribal area which have better knowledge about ethno medicinal utility of the local varieties of plants. Rayagada district people have been traditionally using native folk remedies to treatment of various diseases for generations to generations and passing through orally knowledge. Due to positive utilization of ethno medicinal treatment they have medicinal preparations or strong faith in their own folk crude formulations [16].

2. Materials and methods

The field survey of Rayagada district was conducted from Aug 2021 to Nov 2022. This field study report was conducted with herbal medicine practitioners, selected village old persons, local healers and ethno medicinal practitioners. The local herbal medicine practitioners, local healers and local Baidyas are interviewed regarding the ethno medicinal use of plants which is useful to treatment urinary tract and kidney stones. Various questioning was made in different villages of Rayagada district for information gathered about ethno - medicinal uses of the plant. The selective collected ethno medicinal plant were identified and verified by consulting standard regional local floras [17-19]. The botanical nomenclature has been checked and widely accepted website [20]. The data of ethno- medicinal plants recorded from rural tribal people; rural area people has been compared with various scientific literatures. The present paper studies about some ethno medicinal plants being used in Rayagada area for their anti-urolithiatic, litholytic and litho-expulsive properties. All study was followed as per standard methods of ethno botany [21-23]. The survey of ethno medicines and field visits were regularly conducted in Rayagada district areas throughout the year. The ethno medical plants were collected with the help of village people, tribal people farmers, and other local people. The information about various plants scientific name, local name, family name, part used and ethno medicinal uses were sought from local healers, holy men, priests, Local Baidyas, local herbalists etc. and consulted with aged and experienced knowledgeable men and women, village headmen. All collection of plants were properly identified and preserved with the help of local flora and regional flora [24-32].

3. Results and discussion

The survey of ethno medicinal plants from tribal areas of Rayagada district was conducted with the help local healers, holy men, priests, local Baidyas, local herbalists etc. on the region. The research was clearly found that rural and tribal people of Rayagada district still depends on herbal medicine practioners and local healers. During this survey periods, all information was collected from different villages people and uses of ethno medicinal plants for treatment of urinary tract and kidney stone. Many ethno medicinal plant parts are used in kidney stone and urinary tract treatment. The various ethno medicinal plants which is useful in the treatment of urinary tract and kidney stone was collected during the survey of Rayagada district. Ethno medicinal plant properties of the plant being used in the treatment of urinary tract and kidney stones are given mentioning the name of plants, vernacular name (Odia), family and ethno medicinal uses as reported by the local tribal people (Table-1).

Table 1 List of Ethnomedicinal plants used for treatment of kidney stone and urinary tract treatments

Sl. No	Name of Ethnomedicinal plant	Local Name (Odia)	Family	Part used and ethnomedicinal uses
1.	*Abutilon indicum [33].* 	Pedipedika	Malavaceae	Leaf extracts & Seed and extract is given Urinary disorders.
2.	*Ageratum conyzoides* 	Pokasunga	Asteraceae	Leaf and leaf extract was used in twice a day for treatment urinary disorders.
3.	*Amaranthus caudatus [37].* 	Khadasaga	Amaranthaceae	Leaf and Leaf extract is used for treatment of Urinary tract and Kidney stones.

4.	*Amaranthus spinosus [34].* 	Kantakeera	Amaranthaceae	Root and Root paste uses for reduce Urinary tracts irritation.
5.	*Aerva lanata [36].* 	Pauncia	Amaranthaceae	Leaf and extract of leaf with *Cuminum cyminum* fruits and sugar is given for 10-15 days to cure kidney stone.
6.	*Amaranthus viridis [35]* 	Leutia	Amaranthaceae	All parts of these plants used to treatment of kidney Stone.

7.	*Asphodelus tenuifolium* 	Piaza ghasa	Liliaceae	Leaves and decoction of Leaves are used for treatment of kidney stones and urinary tracts.
8.	*Acalypha indica* 	Indramarisha	Euphorbiaceae	Root extract and root extract used as protective of kidney.
9.	*Achyranthes aspora* 	Apamaranga	Amaranthaceae	whole plant extract and this extract is used for diuretic and kidney stones.

10.	*Acorus calamus* 	Bacha	Acoraceae	Root, rhizome and this extract used for Kidney troubles.
11.	*Aegle marmelus* 	Bela	Rutaceae	Leaf extract and leave extracts can be used to treat Kidney problems.
12.	*Allium cepa* 	Piaza	Liliaceae	Dried bulb and onion juice can treatment of kidney problems.

13.	*Alternanthera sessilis* 	Madaranga	Amaranthaceae	Leaves and its extract used to treat Urinary tract infection and Kidney stones.
14.	*Anacardium occidentale* 	Lanka amba/ Kaju	Anacardiaceae	Leaves, stem bark and leaf extract reduce the risk of kidney stone.
15.	*Azadirachita indica* 	Nimba	Melaceae	Leaves and leaves decoction used for renal injury.

16.	*Beta vulgaris [41]* 	Beet	Amaranthaceae	Rhizome and daily two glass of rhizome juice for 7 days to cure kidney stone.
17.	*Bombex ceiba* 	Simuli	Bombacaceae	stem, bark and given for Urinary problems
18.	*Boerhavia diffusa [40]* 	Gadha puruni	Nyctaginaceae	Root and Root decoction is used daily in one month for treatment of kidney stones.

19.	*Chenopodium album* 	Bathua Saga	Chenopodiaceae	Leaves and cooked leaves as a vegetable given in urinary trouble.
20.	*Costus speciosus[38]* 	Gaigobara/ Chekikanda	Zingiberaceae	Tubers and decoction of tubers are used orally for urinary complaints.
21.	*Capsicum annum* 	Lanka maricha	Solanaceae	Fruit and Raw fruit is used for treatment of kidney Stone.
22.	*Canna indica* 	Kedara/kanna	Cannaceae	Root and its extract used for treatment of Diuretic.

23.	*Carica papaya[39]* 	Amruta Bhanda	Caricaceae	Fruit, Leaf extract and its extract improves renal functions.
24.	*Citrus limon* 	Bada Lembu	Rutaceae	Fruits and lemon juice is used for Reducing kidney stone and Dehydration.
25.	*Cocos nucifera* 	Nadia	Arecaceae	Fruits and coconut water is used for damage of kidney.

26.	*Coriandrum sativum* 	Dhania	Apiaceae	Leaf extract and its extract juice is used for kidney damage
27.	*Cucurbita Pepo* 	Bilati kakharu	Cucurbitaceae	Seed and its Seed is used for kidney damage.
28.	*Cyperus rotaundus* 	Mutha	Cyperaceae	Rhizome and Dried Powdered Rhizome is used for removing renal diseases and Renal calculi.
29.	*Datura metel* 	Dadura	Solamaceae	Fruit and fruit are used for kidney damage.

30.	*Zingiber officinale* 	Ada	Zingiberaceae	Tuber and its rhizome extract is used for Renal failure.

3.1. Plant parts VS. Percentage of plant species

Various plant parts used for ethnomedicinal plant species for treatment of urinary tract and kidney stones. Leaf is the first dominant plant part (14 plants), Root is the second dominant plant part (7 Plants), fruit is the third dominant plant part (5 plants), Rhizome is the fourth dominant plant part (4 plants), stem is the fifth dominant plant part (2 plants) and seed is last dominant plant part (1 plant). [Fig - 1].

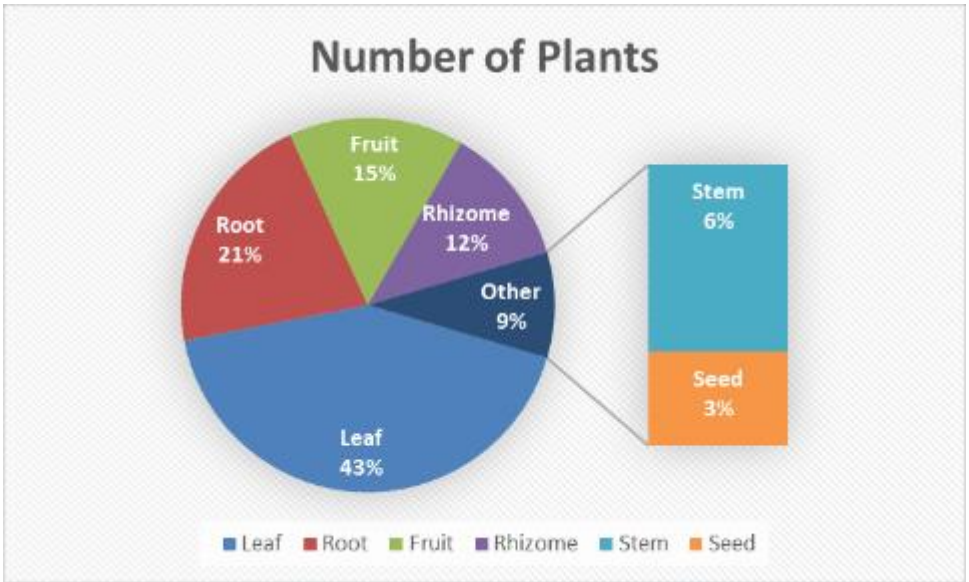

Figure 1 Plant Parts Vs. Percentage of Plant Species

3.2. Familywise classification of ethnomedicinal plants used by people of Rayagada district for treatment of kidney stones and urinary tract

Family wise classification of the plants is 20 families, and 30 plants were identified and used for treatment of urinary tract and kidney stones (Fig-2). Amaranthaceae is the dominant family (7 species), Rutaceae, Liliaceae, Solanaceae, Zingiberaceae with two plant species. The other families contained with one species.

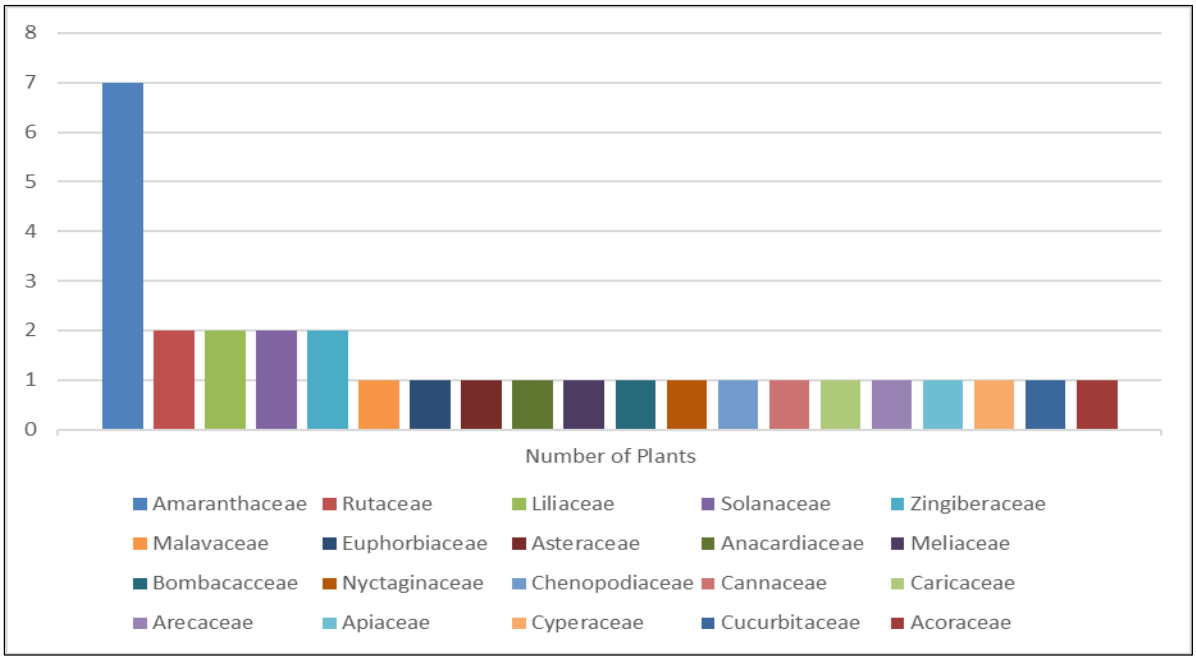

Figure 2 Family-wise classification of the plants with number of ethno medicinal plants use for treatment of kidney stones and urinary tract

4. Conclusion

The aim of present paper was to accumulate the knowledge or information about the herbal treatment for urinary tract and kidney stones. Ethnomedicinal plants are non - toxic, easily available, and less expensive as compared to synthetic compounds. The alcoholic and aqueous extracts of herbal plants are useful in management, prevention, and treatment of kidney stones. The ethno botanical studies are defined as the traditional knowledge of herbal medicinal plant is important not only for tribal people but also for entire global world. Parts of ethno medicinal plant which includes leaf, root, fruit, rhizome, and stem is involved in treatment of kidney stones and urinary tract. Many of the threats to ethno medicinal plant species are like those causing endangered to phytodiversity. Most serious threats are over harvesting, habitat degradation, habitat loss, and population explosion etc. So new harvesting methodologies and conservation should be necessary to ethno medicinal plants from extinction. The study accentuates the need for the proper clinical evaluation and the critical scientific examination of these ethno medicinal plant species for their therapeutic ingredients, which could be used against different urinary tract as well as kidney stones.

Compliance with ethical standards

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Disclosure of conflict of interest:

The authors declare that they have no conflicts of interest.

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