



STUDIES ON MEDICINAL VALUE AND PHYTOCHEMICAL PARAMETERS OF TRADITIONALLY USED PLANTS OF KUNDABAI, MAYURBHANJ, ODISHA

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ABSTRACT

The development of Science and Technology in the 21st century makes everything possible for the human race. But still, the human race is facing lots of problems concerned with nutritional and health hazards. The foodstuffs are becoming less nutritive and the medications become less effective in some infectious diseases due to the development of adaptive features in pathogenic agents. So, the human race should have to think again about alternative sources of food and medicine with better nutritive profiles and potential supplements. This study was aimed to contribute valuable information on the traditional use of plant species used by ethnic people residing in Kundabai village of the Udala block located in the Mayurbhanj district. A total of 154 informants came forward to share their traditional knowledge. In this investigation 9 medicinal plants were recorded, which are being used to treat various ailments like fever, common cold, enteric problems, diabetes, wound healing, microbial infection, and gyening problems. The phytochemicals like alkaloids, tannins, tannic acid, fat and fixed oils, flavonoids, glycoside, phenol, resin, and steroid were detected in these plants, which signifies their medicinal values. In the forthcoming days, these plant species can be used for the betterment of human society.

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INTRODUCTION

The population explosion is one of the major issues in most of the countries of the world. India is placed in the second position next to China and the population status is still increasing. Due to this population explosion the food scarcity, lack of education, more health facilities, economic issues, and unemployment are some of the major issues that have been raised. To resolve these problems, nutrition, health facilities, agricultural production needs to be developed or the substitutes of nutritional sources and the medicinal sources for new effective drugs and antibiotics should be planned in a better way. In Nature, various plant and animal species do have nutritive substances and having the medicinal values. India is a mega diversity country with plenty of diversified plant and animal species, which are being used traditionally by different ethnic people inhabiting in close association with forest and remote locations. In different myths and cultures, the plants are of great value and having powerful constituents, which are capable of treating the physical and physiological problems of the human body. As per the Ayurveda, the medicinal practice of herbal products can be a remedy for every disease (Manavalan and Manian, 2001) of present and past and these are also enriched with nutritional supplements required for our body.

Now many types of research have been conducted on various traditional plant species to fulfill the nutritional requirement and also trying to get a substitution for different expensive and less effective drugs and medicines. Besides the food crisis, there is another issue that is going to be more concerned in the coming year that is health hazards. Most of the causative agents of the different diseases now become more resistant to the currently available medications (Piddock and Wise, 1989; Singh et al., 1992; Mulligen et al., 1993). So, in most developing countries the people are overusing synthetic drugs to get rid of the diseases but due to the inadequate treatment and side effects of the medication, their health problems become more fatal day by day. Therefore, it is urgent to redesign the drugs in a better way and develop new infection-fighting strategies to control the drug-resistant causing agents like microbes, protozoan parasites, and other infectious agents (Sieradzki et al., 1999). This study is aimed to document the traditional plants in Kundabai village and their phytochemical estimation in invitro conditions.

MATERIALS AND METHODS

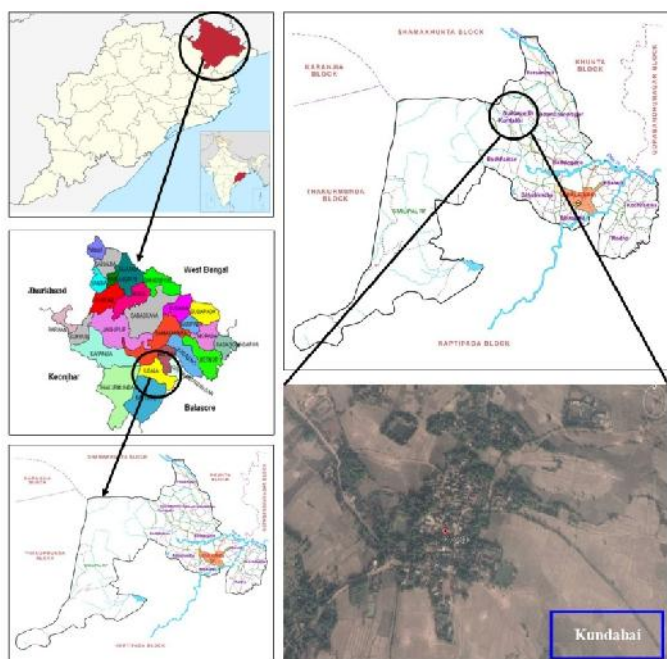
The questioner survey was conducted in Kundabai village (21°39'24.67"N and 86°29'47.39"E) and its nearby areas, which are coming under the Udala block of Mayurbhanj very close to the Devkund (one of the tourist places of Mayurbhanj district) (Fig. 1). A total of 154 informants were interviewed

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based on the traditional use of different plants in their day-to-day life. The questions were based on the use of plants for different ailments, parts use, mode preparation, and their availability. Most of the informants reveal that these information are coming from their forefathers and transferred traditionally as a gift of living with nature. The phytochemical analysis was carried out in the invitro condition. During the field visit, the desired plant samples like leaves, barks, roots, and rhizoids were collected accordingly along with the survey. The samples were carried to the laboratory safely with proper detail and then properly washed with distilled water to remove the dust particles and intact soil content. All the samples were separately dried at room temperature until the samples are not completely dried. After the drying of the plant parts, they were crushed to get powder form, which is to be used in the phytochemical study. The phytochemicals like proteins, tannins, alkaloids, phenols, tannic acid, and quinone were determined by using a standard protocol (Sabandar *et. al.*, 2013).

The informants had mentioned 9 medicinal plant species during the interaction, which they use in their day-to-day life (Fig. 2a-i). The plant detail and their medicinal use are shown in the table-1&2. The *Carica papaya* (Papaya) plant is the most useable plant (20%, Fig. 3) in this area and having great food and medicinal value among the people of the Kundabai village followed by *V. negundo* (18%), *B. monnieri* (12%), *C. dactylon* (10%), *S. asoka*(9%) and (7%) percentage of use was found in *T. arjuna*, *N. nouchali*, and *N. nouchali*. Very least use is found in the case of *A. pinaculata* and *L. inermis* i.e. 5%. The presence of different phytochemicals was found in the traditionally used plant species of Kundabai (Table-3) indicates the medicinal values of these plants. These phytochemicals are more or less bring physiological benefits to the human body.



(By Owa work based on User:Milnesesuro - Derivative of File:India Odisha location map.svg, CC BY 3.0, https://commons.wikimedia.org/wiki/File:India_odisha_dip/cutid-59779435, <http://www.officialsahamancha.org/area-of-focus/odisha/district-profile/injanyabhanj/udala/>, <https://satexplorer.com/slide/9106243/>.)

Fig 1 Kundabai village area in Udala block of Mayurbhanj district

RESULTS

In this study, a total of 154 informants were interacted and out of which 136 were positive respondents and provide valuable information of our interest.



Fig 2a-i. List of traditionally used plant species of Kundabai village and its nearby area [Fig. 2a. *Bacopa monnieri* (Bramhi); b. *Saracaasoka* (Ashoka); c. *Nymphaea nouchali* (Water Lilly); d. *Vitex negundo L.* (Begunia); e. *Lawsoniainermis* (Henna); f. *Terminalia arjuna* (Arjuna); g. *Andrographis paniculata* (Kalmegh); h. *Cynodondactylon* (Grass); i. *Carica papaya* (Papaya)]

Fig. 3 Percentage of use of plants in Kudabai

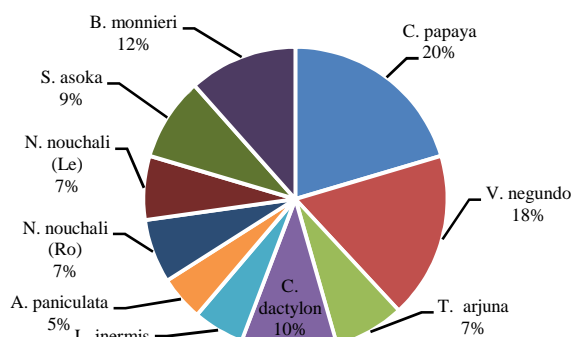


Table 1 Traditionally used plant details of Kundabai

Plant no	Scientific name	Order	Family	English name	Local name	Habitat	Seasonal availability
Plant-1	<i>Carica Papaya</i>	Brassicales	Caricaceae	Papaya	Amruta bhandra	Distributed in tropical and sub-tropical	All-season
Plant-2	<i>Vitex negundo</i>	Lamiales	Lamiaceae	Indian Privet	Begunia	Tropical eastern and southern Africa and Asia	All-season
Plant-3	<i>Terminalia arjuna</i>	Mrytales	Combretaceae	Arjun	Arjuna	Tropical regions of India	Winter
Plant-4	<i>Cynodondactylon</i>	Poales	Poaceae	Tendrill	Dubaghasa	Universal distribution	All season
Plant-5	<i>Lawsoniainermis</i>	Myrtales	Lythraceae	Henna	Henna	Universal distribution	Winter
Plant-6	<i>Andrographis paniculata</i>	Lamiales	Acanthaceae	Kalmegh	Kalmegh	Universal distribution	All-season
Plant-7	<i>Nymphaea nouchali</i>	Nymphaeales	Nymphaeaceae	Water lily	NaliKaen	Aquatic	All-season
Plant-8	<i>Saracaasoka</i>	Fabales	Fabaceae	Ashok	Ashoka	Universal distribution	All-season
Plant-9	<i>Bacopa monnieri</i>	Lamiales	Scrophulariaceae	Thyme	Brahmi	Wet & Marshy area	All-season

Table 2 Traditional medical use of plants in Kundai village of Mayurbhanj district

Plant no	Plant name	Part use	Use for alignment	Used as	Mode of preparation	Results
Plant-1	Papaya	Fruit & leaf	Diabetic, blood pressure, indigestion & weight loss	Fruit as Food & leaf as medicine	Fruit taken after peeled & the leaf is taken in juice form	7 days
Plant-2	Begunia	Leaf	Cold Fever, Asthma, Malaria	Medicine	Leaves Are crushed Well and Consumed with Water	15-20 Days
Plant-3	Arjuna	Bark	Asthma, Bile Duct Disorder, Scorpion Sting, Mouth Cancer	Medicine	Bark Are Dried and crushed and Mixed with Water or Milk and Then Consumed for Remedies	2-4 Weeks
Plant-4	Grass	Leaf	Wound Area, Headache, Enhance Immunity	Medicine	Leaves are crushed and consumed for remedies	7-10 days
Plant-5	Henna	Rhizoids, leaf	Headache, Jaundice, Sunburn & Rashes, Wounds, Piles, Arthritis	Medicine	Rhizome leaves are soaked with warm water and then crushed and consumed	3 to 5 days
Plant-6	Kalmegh	Leaf	Malaria, Constipation, Skin Infection, Irregular Menstrual Syndrome, Blood Purification	Medicine	Leaves are soaked in water overnight or consumed with warm water	5-10 days
Plant-7	Water lily	Rhizoids	Menstrual Problem, Uterine Infection	Medicine	rhizoids are crushed and consumed for remedies	1 month
Plant-8	Ashok	Bark, Flower	Menstrual Pain, Uterine Infection	Medicine	Bark and Flower Are Dried and crushed and Consumed for Remedies	15-25 days
Plant-9	Brahmi	Leaf, Stem	Asthma, memory loss, Fever, Stomach Problem, Alzheimer's Diseases	Medicine	Leaves Are crushed and Consumed for Remedies	2 to 3 days

Table 3 Traditional medical use of plants in Kundai village of Mayurbhanj district

Plant name	Alkaloid test				Fat and fixed oil	Flavonoids	Glycoside	Phenol	Resin	Steroids	Tannin
	Mayer's Reagent	Wagner's Reagent	Tannic Acid	Ferric chloride							
<i>C. papaya</i>	-	+	-	-	-	+	-	+	-	-	+
<i>V. negundo</i>	-	-	-	-	+	+	-	+	-	-	+
<i>T. arjuna</i>	+	+	+	+	-	+	-	+	-	+	+
<i>C. dactylon</i>	-	+	+	+	+	-	-	-	+	-	-
<i>L. inermis</i>	-	-	-	+	+	+	-	+	-	+	+
<i>A. paniculata</i>	-	+	-	+	+	-	+	-	+	+	-
<i>N. nouchali</i> (Root)	+	+	+	+	-	+	-	+	+	-	+
<i>N. nouchali</i> (Leaf)	-	-	-	-	+	+	+	+	+	+	+
<i>S. asoka</i>	+	+	+	-	-	-	+	+	+	+	+
<i>B. monnieri</i>	-	+	+	-	+	+	+	+	+	-	+

Here Positive symbol (+) stands for Present, Negative symbol (-) stands for absent

DISCUSSION

All the traditionally used nine-plant species have great food and medicinal value among the people residing in the Kundabai area and its periphery region. In most cases, leaf juice is used frequently to treat various ailments to get a better result. Interestingly, these plants are available throughout the year, this frequent availability is very helpful to people at the time of sudden requirement. We all are very familiar with the use of papaya in our daily life, where we are only taking the papaya fruit but not the skin, seed, and leaves of the papaya which high medicinal value and will play a great role in our body when we make it use in daily basis. Begunia (*V. neguda*) is another very important species having beneficiary chemical components (Gautam *et.al.*, 2008) has antimicrobial properties (Devi *et.al.*, 2008; Khokra *et.al.*, 2008), which will help to treat the enteric microbial infection. In some cases, people are using sticks to brush their teeth to avoid bacterial growth in the oral cavity. It has been reported that the phytochemicals like tannic acid and tannin as found in these plants have a great role in controlling blood pressure and obesity (Huang *et. al.*, 2013). Similarly, the presence of alkaloids in these plants can fulfill the nitrogenous requirement to some extent (Liu *et. al.*, 2010).

CONCLUSION

Traditional information, which was playing an important role in past days and serving as an alternative, where the modern things are not available. In this investigation, a limited no of plants are recorded due to the lack of traditional information among the people. This indicates that this traditional information is periodically vanishing from the society and the young one of the new generations are not putting any interest towards learning the skills of utilizing the natural raw medication methods. In the current era, a variety of modern medicine and nutritional sources are available, which provide instant relief and energy to the body but these are only temporary. All these modern-day products are obtained from the same natural sources, which are explained earlier in the Indian Medicinal System. So, people should learn about the skills of proper utilization of natural therapies for health issues which will not only keep them safe but also will help to conserve this traditional knowledge for a better future.

Authors contribution

Subhrakanta Jena (Ph.D. Scholar, RGNF-SRF, UGC, Govt. of India) has developed the whole idea of the study, structured questionnaires' for the survey, manuscript correction and graph

plotting, conduct the fieldwork, documentation of traditional data, map designing, write up and structuring the manuscript. Sushree Sudha Das (Ph.D. scholar, BPRF-SRF, DST, Govt. of Odisha) assisted in data analysis and compiling the information. Prof. Hemanta Kumar Sahu assisted in availing the departmental facilities in the P.G. Department of Zoology, Maharaja Sriram Chandra Bhanja Deo University, Baripada-757003, Mayurbhanj, Odisha and Omprakash Satpathy (Pre-Ph.D, student). assisted in providing local support and helped in coordinating the field study in different localities of the study area.

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