

AN ETHNOBIOLOGICAL STUDY OF MEDICINAL PLANTS
& ANIMALS IN DHEMAJI DISTRICT, ASSAM



*A dissertation submitted in partial fulfillment of the requirement for the
degree of Master of Science in Zoology*

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CERTIFICATE

This is to certify that the dissertation entitled "AN ETHNOBIOLOGICAL STUDY OF MEDICINAL PLANTS & ANIMALS IN DHEMAJI DISTRICT, ASSAM" submitted in partial fulfillment of the requirement for the degree of Master of Science in Zoology is a compilation of the result of bonafide work carried out by Diplina Kalita (Reg. no : 450828220 , Roll no : 202820024007) , department of ZOOLOGY , Silapathar science college affiliated by ASSAM SCIENCE AND TECHNOLOGY UNIVERSITY , (Assam) under my guidance and supervision .

The dissertation or any its part has not been submitted elsewhere for any other degree of distinction in any other university / institution . All the help and assistance received during the course of work have been duly acknowledged .

I am pleased to forward this dissertation for consideration for the award of the degree of Master in Science in Zoology (Under Silapathar science college) affiliated by ASSAM SCIENCE AND TECHNOLOGY UNIVERSITY , Assam .

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CANDIDATE' S DECLARATION

I , Diplina Kalita , hereby declare that the research work entitled " AN ETHNOBIOLOGICAL STUDY OF MEDICINAL PLANTS & ANIMALS IN DHEMAJI DISTRICT , ASSAM" in partial fulfillment of the requirement for the degree of Master of Science in Zoology is being presented in the form of thesis and submitted in the department of Zoology , Silapathar Science College affiliated by ASSAM SCIENCE AND TECHNOLOGY UNIVERSITY (Assam) , under the supervision of Dr. Jashodeb Arjun , associate professor .

The matter presented in the project has not been submitted by me for any other degree of this or any other institute .



Signature of the Candidates

This is to certify the above statement made by the candidate is correct to the best of my knowledge .

Date : 23-07-22



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Diplina Kalita

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INTRODUCTION

Plants are precious which can act as medicine also. Medicinal plants are considered as a rich resource of ingredients which can be used in drug development either pharmacopoeial, non pharmacopoeial or synthetic drug. Apart from that these plants play a critical role in the development of human cultures around the whole world.[2]

That term "medicinal plant" includes various types of plants used in herbalism. The word herb has been derived from the Latin word "herba" and an old French word "herbe". Now a days herb refers to any part of the plant like fruit, seed, bark, flower, leaf, stigma or root as well as non woody plants, including those that come from trees and shrubs. These medicinal plants are also used as food, flavanoid, medicine or perfume and also in certain spiritual activities.[1]

The World Health Organization is giving considerable importance to alternative medicines to provide primary healthcare to millions of people primarily in the developing countries. India has a rich diversity of plants and animals which are used for medicinal purposes. Knowledge of these medicinal plants and animals has been accumulated in the course of many centuries. In India there are more than 43% of total flowering plants are reported to be of medicinal importance.[5,6]

According to World Health Organization 80% of the rural population in third world countries depends on different kinds of locally available medicinal plants as

a part of primary health care needs . India is one of the 12th mega biodiversity centre having 45000 plant species representing about 7% of world flora. About 7500 plant species used as medicines have been reported in Indian traditional system of medicine viz. Arunachal Pradesh ,Assam ,Manipur, Meghalaya, Mizoram, Nagaland ,Tripura and Sikkim is one of the richest biodiversity region in India. Assam is one of the culturally rich states of North East India . Dhemaji cover an area of 3237 square kilometre[22,23] . Geographically the latitude and longitude of Assam is 22°19' to 28°16' north and 89°42' to 96°30' east respectively .

The state extends between foothills of eastern Himalayas and the Patkai and Naga hills and is bordered by the countries such as Bhutan to North west , Bangladesh to the southwest, Myanmar to the south . Assam has a humid tropical and subtropical climate as it receives heavy rainfall during monsoon . Assam is inhabited by a number of ethnic tribes belonging to the Indo mongoloid races which include Boro , Missing ,Karbi ,Dimasa ,Rabha, Tiwa,, Sonowal kachari, Ahom ,Deori, Chutia, Koch ,matak ,moran [11,12]

Dhemaji is the district of Assam and is very rich in plant biodiversity and has great traditional knowledge based in plant resource.The various tribes inhabiting in Dhemaji district has some traditional health care practice used by local inhabitants for treating illness.[8]

Dhemaji has many big and small river flowing through it.Some of them are Jiyadhah ,Gainodi etc[10] .Therefore the district is prone to flood every year and faces severe loss .It worth mentioning that among all districts of Assam Dhemaji

district contains huge number of tribes .Most of the people use various indigenous plants as a source of medicine for healing some common illness .[13]

North-East India is considered to be rich in both flora and fauna along with diverse culture and tribes. Deori tribe is one of the plain tribal community of Assam dwelling mostly in the upper valley of Brahmaputra with their rich culture and traditional heritage. Dhemaji district is also inhabited by this Sino-Tibetan family of Mongoloid race. Rich diversity gives an ample source of zoo-therapeutic knowledge and belief passed on from generation to generation among different existing native tribe for the primary health care system [6, 11]. Zoo-therapeutic practices deals with the treatment of human health problem, from the by products derived from animals which is considered as the essential constituent of curative measure [3]. Treatment of human ailment with the help of local indigenous medicines from animal can be said to be zootherapy, which also serve as a great significance in religious, culture, magic rituals [13]. Tribal inhabitants of Namakkal district of Tamil Nadu prefer homemade remedies from 45 different species of animals for treating 55 ailments [6]. Nyishi tribe of Arunachal Pradesh practices zootherapy with the use of 18 animal species for preparing medicines well as taken as diet [13]. Bodo tribe of Assam also highly depends on the traditional knowledge of using different frog species for treating various skin diseases [11] . Native khasi tribe of Meghalaya is also reported to have applied knowledge of zoo-therapy in treating malaria, boils, white blemish on tongue and lips similar to leucoderma and many diseases [10]. 39 species of aquatic and terrestrial animals are reported to be used as treatment by Adi tribe of north east [4]. Even Tangsa and Wancho tribe of Arunachal Pradesh prefer to use medicines derives from birds and animals in the treatment of various health related problems [8]. Use of 14 species ichthyo-fauna is another traditional practice of disease

treatment among the karbi people [14]. Another report of using 48 animal species for treating diarrhea, gastritis, jaundice, body ache etc is being identified by major ethnic groups of Karbi Anglong .

In consideration of above the study of " the use of various medical plants and animals to cure some disease traditionally by the people of Dhemaji district of Assam " is taken to understand and find the use of plants which are available in Dhemaji District as a source of medicine and are used to treat disease and for this I have visited two remote villages of Dhemaji District and interacted with the local peoples.

OBJECTIVES

1. To study the medicinal plants and animals found in a particular area of Dhemaji district .
2. To know whether the people are aware about the use of medicinal plants.
3. To understand the use of medicinal plants for treatment.
4. Identify how medicinal herbs are used.
5. Explore origin of herbal medicine.

REVIEW OF LITERATURE

Plants have been used for medicinal purpose for long before prehistoric period. Ancient Unani manuscript, Egyptian papyrus and Chinese writings describe the use of herbs. Evidence exist that Unani Hakims ,Indian Vaid and European and Mediterranean cultures were using herbs for over 4000 years as medicine indigenous culture such as Rome, Egypt, Iran and Africa and America used herbs in there healing rituals,while other developed traditional medical systems such as Unani, Ayurveda, Chinese medicine in which herbal medicines where used systematically [25,22]

Among ancient civilizations, India has been known to be rich repository of medicinal plants. The forest in India is the principle repository of last number of medicinal and aromatic plants which are largely collected as raw materials for manufacture of drugs and perfumary products.[3]

The earliest historical records of herbs are found from the Sumerian civilization. The Ebers Papyrus from ancient Egypt 1500 BC describe over 850 plant medicines[16].

Atharvaveda contain 114 hymns related to formulation for the treatment of different diseases. From the knowledge gathered and nurtured over sanctuaries to major school and eight specialization got evolved. One was the school of physicians called Dhanvantari Sampradaya and the second school of surgeons referred in literature is Atreya Samprdaya[6].

Recent work on medicinal plants in traditional health care in Dhemaji district of Assam have been done by many scholars and released many research papers among them some of the scholars are Dr Mridula Saikia Barua, Manisha Dutta, Mousumi Gogoi In the year 2019. [19]

Another research work done by Citumoni Gogoi and Mridushmita Borah on international journal of fauna and biological studies titled " ZOO-therapeutic practices among the Deori tribes of Dhemaji District , Assam , India " about how they expertise in handling the natural remedies from locally available fauna. This research paper was released on 6\5\2020[11]

Recently WHO estimated that 80% of people worldwide rely on herbal medicine for some aspects of their primary health care needs. According to WHO around 21000 plant species have the potential for being used as medicinal plants. More than 30% of entire plant species at one time or other were used for medicinal purposes.[2]

On 2017 Singh A .et.all in has released a journal where he and his co-authors has described about the medicinal plants used by missing tribes in Dhemaji district.

It has been estimated that in developed countries such as United States plant drug constitute as much as 25% of total drugs why in fast developing countries such as India and China the contribution is as much as 80%. Thus the economic

importance of medicinal plants is much more to countries such as India than the rest of the world[4,5].

Treatment with medicinal plants is considered very safe and there is no or minimal side effects. Ancient scholars believe that herbs are only solutions to cure a number of health related problems and diseases.[2]

MATERIALS AND METHODS

Study area :- Dhemaji district is situated at the north of Upper Brahmaputra Valley of Assam which is located between the $94^{\circ} 12' 18''$ E and $95^{\circ} 41' 32''$ E longitudes and $27^{\circ} 05' 27''$ N and $27^{\circ} 57' 16''$ N latitudes, the district covers an area of 3237 sq. Km and is basically plain area lying at an altitude of 104 m above the mean sea level. It has an average elevation of 91m. Dhemaji is located to the north of river Brahmaputra. To its north lies the Arunachal Himalayas. To its east lies the State Arunachal Pradesh and to the west is Lakhimpur a district of Assam. It has large and small rivers flowing through it. Some of them are Jadhah, Gainodi, Dihang, Dimow, Simen. And Subansiri river flows by its western border.

The climate of the area is warm humid type and temperature varies between 8°C to 35°C , average annual rainfall is 2600 mm to 3200 mm. The soil is acidic in nature. The local community of the study area are Ahom, Sonowal kachari, kalitas and important natural resources which are available in the study area have been used in folk medicine by the locals primary health care needs and disease treatment.

Division of study area-

1. Dhemaji bharalichuk village.
2. Bishnupur tekjuri village.



Site 1 : - Bharalichuk village , Dhemaji .



Site 2 :- Bishnupur , Tekjuri village , Dhemaji .

METHODOLOGY

On may 20 , 21 ,22 and 23 I visited my study area that is Bishnupur village on (20 and21) and Bharalichuk village on(22and 23). To collect some important information about traditional medicinal plants used by people of that particular villages.Both the villages are situated in Dhemaji district.

The villages that are mostly inhabited by the sonowals kacharis ,kalita are under my study area and were surveyed randomly. With proper consent of the people I personally have visited some of the experience person who use to give medicine to cure some diseases or give medicine to the people of that area. There I came to know that a person name Dimbeswar Dutta used to give medicines to the local peoples to cure some diseases. And when I interacted with him I came to know that he have gained this knowledge of how to cure some of the diseases from his father.

There he have shown me various leaves and plants which he used to make medicines. I took the pictures of those plants and later with the help of Google lens and some of my teachers , I collected the scientific name. I was not able to make herbarium as he did not allowed me to bring the leaves along with me.

I interacted with that person for many hours and collected information of the medicinal use of plants and how they are being given to the patients and I have cross checked with the information obtain from the local herbalists.

In my second spot that is Bharalichuk village I also have interacted with Mr.Jogen Bharaji . There he also cooperated with me and have shown and

explained me about what plants he used and how he give the dose of medicine to his patients.

RESULT

In the present investigation /study many species of plant and animals were seen which the people of Dhemaji use to make medicine . Photos of those medicinal plants were also taken . Below given are the name of some plants which are use to cure some particular disease .

Table 1 : - LIST OF DISEASE WHICH ARE CURED BY PLANTS

DISEASE NAME	PLANT USED FOR TREATMENT		HOW IT IS CONSUMED\PREPARATION OF MEDICINE
	SCIENTIFIC NAME	COMMON NAME	
1.PNEUMONIA	<u>1.Sterculia foetida</u>	Sotiona	Two to three leaves of all these plants are taken and grinded,blackpeeper is added and it is boiled by adding some water.and five to six spoon of the soup is given to the patient two times a day.
	<u>2.Erythrina variegata</u>	MODAR	
	<u>3.Tabernaemontana divaricata</u>	Pinwheel flower(KOTHD NA)	
2.BLOOD CLOTTING	<u>Cynodon dactylon</u>	Bahma or brahmi grass	Paste of the leaves are made and applied on the infected area from where blood is coming out.

3. HEADACHE	<u><i>Oxalis acetosella</i></u>	Common wood sorrel	Paste of the leaves is made and massage is done after putting the paste on the head.
4. FUNGAL INFECTION	<u><i>Azadirachta indica</i></u>	Neem plant	Take neem leaves and boil for two to three minutes, apply in the infected area.
5. MALARIA	<u><i>Azadirachta indica</i></u>	Neem plant	Juice is made from neem leaves and it is given twice to the patient.
6. WORM INFECTION	<u><i>Punica granatum</i></u>	Pomegranate	Bark of these plant is taken and grinded and sugar is added and can be taken directly with water.
7. EAR INFECTION	<u><i>1. Lablab purpureus</i></u> <u><i>2. Bida pilosa</i></u>	Hyacinth bean Farmers friends	Juice is extracted from both the plants and it is being applied on the infected area.
8. To heal burn	<u><i>Aloe barbadensis miller</i></u>	Alovera	Alovera paste is made and it is applied on the burning area.
9. Lowering blood sugar level	<u><i>Aloe barbadensis miller</i></u>	Alovera	Two spoon of alovera juice per day.
10. Clear skin and	<u><i>Aloe barbadensis miller</i></u>	Alovera	Alovera paste can be

hydration			made and put on the skin
11. Anti aging	<u><i>Ocimum tenuiflorum</i></u>	Holy basil	Two to three leaves can be taken and chewed every morning in order to get rid of these problems
12. kidney stone	<u><i>Ocimum tenuiflorum</i></u>	Holy basil	Two to three leaves can be taken and chewed every morning in order to get rid of these problems
13. Dental and oral health	<u><i>Ocimum tenuiflorum</i></u>	Holy basil	Two to three leaves can be taken and chewed every morning in order to get rid of these problems
14. Control diabetes	<u><i>Ocimum tenuiflorum</i></u>	Holy basil	Two to three leaves can be taken and chewed every morning in order to get rid of these problems
15. Gastritis, Nausea, Vomiting, bleeding from anus	<u><i>Clitoria ternatea</i></u>	Butterfly pea	3-4 flower is taken and boiled in water and the patient can consume the water.

LIST 2 : - List of fish which are used to cure some particular disease .

Disease Name	Common Name	Scientific Name	How It is Consume
1.HEALTHY BONES	Eel	<u>Anguilla bengalensis bengalensis</u>	Curry of this fish is made and patient or any person can consume this fish to get rid of these disease.
2.TO LOWER HIGH CHOLESTEROL LEVEL	Eel	<u>Anguilla bengalensis bengalensis</u>	Curry of this fish is made and patient or any person can consume this fish to get rid of these disease.
3.DIABETES	Eel	<u>Anguilla bengalensis bengalensis</u>	Curry of this fish is made and patient or any person can consume this fish to get rid of these disease.
4.ARTHRITIS	Eel	<u>Anguilla bengalensis bengalensis</u>	Curry of this fish is made and patient or any person can consume this fish to get rid of these disease.
5.MALARIA		<u>Dried fish</u>	Curry is made and consume with rice.
6.GOOD EYE VISION	puthi fish	<u>Puntius terio</u>	It is boiled, fried and curry is made and can be consume with water.
7.PROPER GROWTH(IMPROVE TISSUE GROWTH)	puthi fish	<u>Puntius terio</u>	It is boiled, fried and curry is made and can be consume with water.

8. FAST WOUND HEALING	GoroI	<u>Channa punctatus</u>	Curry of this fish is made and can be consume with rice.
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LIST 3 : - List of animals which are used to cure particular disease .

DISEASE NAME	SCIENTIFIC NAME	COMMON NAME	PREPARATION OF MEDICINE
1. Rheumatic and skin problem	<u><i>Sus scrofa domestica</i></u>	pig	Oil is applied on the effected area.
2. Gastritis, skin problem on hand	<u><i>Bos Indicus</i></u>	cow	Milk is mixed with raw turmeric juice and is taken or, applied on affected area
3. Speech problem in child.	<u><i>Capra hircus</i></u>	goat	Tongue is cooked and given to eat
4. Hand and leg cramps	<u><i>Capra hircus</i></u>	goat	Bones are boiled with paste of ginger, pepper and water and taken orally
5. Paralysis	<u><i>Canis indicus</i></u>	fox	Flesh is cooked and consumed

Images of plants which are used for medicinal purposes :-



Fig 1 :- Cynodon Dactylon (common name :-Bahama grass)

- This plant has been used as antimicrobial , anti-inflammatory agent .



Fig -2 : Clitoria ternatea (Common name :- Butterfly pea)

It is rich in antioxidants and may be linked to several health benefits ,including weight loss , better blood sugar control , and improvement in hair and skin health .



Fig.3 :- *Ocimum tenuiflorum* (common name :- Holy basil)

It has the property to cure kidney stone , headache , decreases swelling .



Fig.4 :- *Azadirachta indica* (common name :- Neem plant)

It nourishes skin , treats fungal infection , increases immunity .



Fig-5 : *Aloe barbadensis miller* (common name : - aloe vera)

it soothes burns and heals wounds



Fig 6 :- *Punica granatum* (common name : - pomegranate)

- It cures worm infection



Fig 6 : -*Psidium guajava* (common name : guava plant)

- Guava leaves are used for stomach and intestinal conditions, diabetes etc.



Fig :- *Oxalis acetosella* (common name :- tengsei)

It is rich in vitamin C and is used to cure gastritis, indigestion



Fig : -Sterculia foetida



Fig : -Bidens pilosa



Fig :- Erythrina variegata



Fig : Tabernaemontana Divaricata

Images of fish which are used for medicinal purpose :-



Fig :- Puntius terio

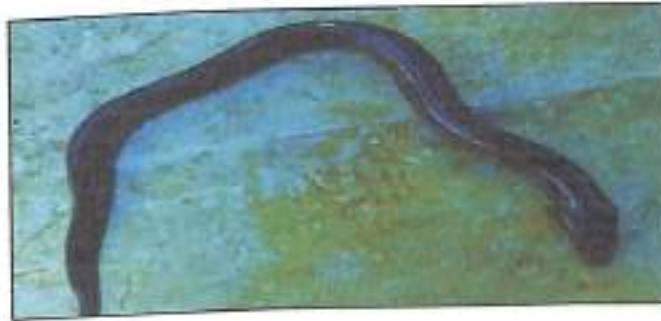


Fig :- Anquilla bengalensis bengalensis



Fig :- Dried fish



Fig - *Channa punctata*

DISCUSSION

Majority of plants describe in the present investigation were used in-

1. Pneumonia
2. Blood clotting
3. Headache
4. Fungal infection
5. Malaria
6. Fever
7. Crack heels
8. Worm infection
9. Ear infection
10. To heal burn
11. Lowering blood sugar level
12. Anti aging
13. Kidney stone etc

A number of plants were also used in daily life as food. Mostly leaves were used for making the medicine.

The most common mode of administration during disease management was decoction, paste and juice for internal and external application. Taking as vegetable was also useful in alleviating several ailments.

Most of the medicines were taken orally. The herbal practitioners usually collect the plants from the wild as and when there is need. In some cases a few of them maintain small herbal gardens for the purpose.

We have seen that many plants which are found in our house are used to cure many disease like-Tulsi is used to cure-

- 1 kidney stone
2. Hypertension
3. Improve dental and oral health
4. Control diabetes etc.

Several medicinal plants is now accepted and used in traditional healthcare disease as it has very low side effects.

The efficacy of this medicine cannot be judged properly, although common ethnic people use this medicine for treating common illness even though there are hospitals, sub centre. It is because Dhemaji is a flood affected area and every year people faces huge loss due to flood. Therefore to some extent it remains untouched to modernization.

We have seen that medicinal plants have played a crucial role in some of the remote villages of the district. It is most important that this plants should be cultivated and propagated. Young people need to be encouraged to preserve these traditional knowledge for better treatment of future mankind in this district.

CONCLUSION

From the present study it is concluded that there are many medicinal plants , fishes, and some animals which are used by the people of remote villages to cure some disease.

Many people from other districts come to Dhemaji to cure their disease without preferring allopathic treatment.

The knowledge of medicinal plants and animals plays a significant role in various ethnic community of the society.[20] The traditional practice are the main source of knowledge of medicinal plants. Some of the medicinal plants and their traditional uses of herbal medicine gradually decrease due to poor storage of data, different development activities and anthropogenic factors. Therefore there is an urgent need to formulate a good amount of data and appropriate conservation strategies for conservation of this medicinal plants on the sustainable basis.

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