



IDENTIFICATION AND COMMERCIALISATION OF ETHNO MEDICINAL PLANTS FOUND IN KAPLA BEEL OF ASSAM, INDIA

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ABSTRACT

Assam of North East India is situated in one of the 20 biodiversity hotspots of the world. The state is famous for its diversified flora and fauna. The forest reserves, wildlife sanctuaries, national parks, wetlands all are full of medicinal plants. *Kapla Beel* is one of the prominent bills of Assam. This *Beel* is also rich in aquatic resources. The present study has been done on medicinal plants found in *Kapla Beel*. The study has been done on the basis of survey and focus group discussion. The results show that the *Kabiraj* of the surrounding villages use different medicinal plants found in *Kapla Beel* to treat diseases. It is suggested that the plants are needed to conserve for the future generation.

Key words: wetland, medicinal plants, *Kabiraj*, treatment.

I. INTRODUCTION:

Assam is situated in one of the important biodiversity hotspots among 25 of the world. Assam is very rich in plant diversity also. Assam is full of ethno medicinal plants. Every plant has some medicinal value. During the pre-modern era, people of Assam depended on medicinal plants for treatment of diseases. Even today where the modern medicine fails to cure a disease, the ethno medicine works. Number of plants have been identified that can cure some chronic diseases. However ample of works have been done on ethno medicine. Some of the studies are briefly discussed below:

Bhattacharya et al (1991) discussed about the rare medicinal plants of Assam. The author reveals that there are 200 medicinal plants in Assam. He gave a details of 30 medicinal plants that are rare to find. The authors mentioned the botanical description of the plant, the part of the plant that is used to treat a disease. They also identified the causes of degeneration of the medicinal plants of Assam and gave some suggestions to conserve the important medicinal plants.

Baishya *et al* (2015) studied about the Forest-based medicinal plants those are used to treat the rural people of Assam. The author argued that ethno medicine based on plants played an important role in the developing countries where the modern medical facilities are limited. The ethno medicine are safe effective and inexpensive as they argued for which the rural people can easily used for treating their diseases. The study has explored 36 types of medicinal plants and which part of the plants the community use as medicine.

Bora *et al* (2016) explored the folk medicinal plants used for female health care in Assam. The authors have reported 101 plants those are used to treat gynaecological problems such as pregnancy related issues, leucorrhoea, menstruation disorders, dysmenorrhoea etc. They have done a detail study that reveal what kind of plant used by which community and which part of the plant to treat what kind of health related issues etc.

Deka *et al* (2019) studied 31 types of medicinal plants found in the wetlands of Western Assam. The authors focused their study on which part of the plant is important to which kind of diseases. The authors identified the plants for treating skin diseases, jaundice and liver problems, fever, urinary tract, blood pressure, snake bite, cough, stomach pain, wounds and cuts, neuralgia, teeth ache, tonsillitis.

Kalita and Kalita (2014) explored some ethno medicinal plants of Assam that can be used to treat Pneumonia. The authors selected 20 plant species belonging to 17 families that are used in the treatment of

pneumonia. They identified the parts of the medicinal plants that are used to treat pneumonia. The study has proved that the ethno medicinal plants they identified have the antibacterial activities against selected pneumonia. They also argued that the plants may be a safe alternative way to treat the disease.

Ahmed *et al* (2020) study concentrated to only one plant, *Pistia stratiotes L* that belongs to *Araceae* family. The common name of the plant is water lettuce. The plant has been used to treat different kinds of diseases viz. Mouth inflammation, eczema, leprosy, ulcers, piles, throat inflammation, stomach disorder etc.

Gogoi *et al* (2019) did their survey in Dhemaji District, Assam regarding the traditional use of medicinal plants by the tribal people to treat different diseases. They identified 64 indigenous plants that are used to treat different common disease. They mentioned the scientific name, vernacular name, family, parts used for treating as medicine and name of the diseases cured.

Taid *et al* (2014) studied their research on ethno medicine based on plants in Dhemaji District. Their study concentrated on reproductive related health issues. They identified 20 species belonging to 16 families. They found that though the modern medical facility is easily accessible, the people rely more on the traditional medicine for treating reproductive related diseases. The author suggested to harness the knowledge of use of the medicinal plants.

Acharyya and Sharma (2004) revealed that the people of Mahmora area of Sibsagar District use different plants as ethno medicine. They identified 33 plant species under 35 genera belonging to 30 families. The authors also mentioned method and procedure of the ethno medicinal plants in different types of diseases.

Thus it is found that most of the studies are related to either a single plant or multiple plants. In case of single plant, studies are concentrated regarding the ethno medicinal use of the plant. In case of multiple plants, studies are concentrated within the state as a whole. The wetlands of Assam that are known as *Beels* are very rich in medicinal plants. No studies are found to explore the medicinal plants available in a particular *Beel*. To fill this research gap, the present study has been conducted in Kapla *Beel* of Assam to identify different medicinal plants available in the *Beel*. The study is also conducted to identify the part of the plan that is used to treat what kind of diseases.

II. STUDY AREA:

Assam is within one of the important 25 biodiversity hotspots of the world. Her rivers, streams, different wetlands, hills, plain areas all makes diversified ecosystem. Wetlands are the regarded as natural kidney. Kapla

Beel is one of the famous wetlands of Assam for its sweet fish varieties. The wetland is also full of diversified medicinal plant varieties. The wetland is situated in the southern-west side of Barpeta district. The place is nearly 65km away from the state capital, Guwahati. The wetland is spreaded 61 hector area of land. It is very rich in local verity of fishes. It is also rich in case of diversified plants.

For 24 hours next 24 total 48 hours.

There are 23 numbers of wetlands in Barpeta district of Assam. Out of 23 numbers of wetlands, *Kapla Beel* is chosen because *Kapla Beel* is the most famous for its biodiversity and ecosystem. The average rainfall is 77.8 cm per year. The average temperature of the area is 24.6⁰ C.

III. MATERIAL AND METHODS:

The study is basically based on primary data. For collecting primary data field study has been done in *Kapla Beel*. The author surveyed the wetland from October, 2020 to March, 2021. October, 2020 to March, 2021 have been chosen intentionally because April, May, June, July, August, September are the raining months in Assam. The author photographed the collected plants, washed it, collected in the polythene bags, and dried properly. The dried plants are wrapped properly through news paper, changed in every 24 hours for 48 hours.

For identifying the medicinal plants, the author of this article formed a Focus Group Discussion. The Focus Group comprised two *Kabiraj* (practitioners of ethno medicine) viz. Boga *Oja* and *Kabiraj* Ambika Sarma, and one Academician P. C. Deka, retired Associate Professor and Ex-Head from the Department of Botany, B.B.K. College, Nagaon, Barpeta. Among the terrestrial as well as aquatic plants of the wetland, group identified has been done of the medicinal plants. The Focus Group also focused the medicinal value of each plant, the types of diseases healed by the plants etc.

IV. RESULTS AND DISCUSSION:

4.1 Medicinal value of the plants got in *Kapla Beel*:

Amaranthus viridis L.: The common name of the plant is green *amaranth*. Root juice is used for treating inflation related to urine. Besides, the whole plant is orally used to treat dysentery and constipation till cure.

Alternanthera sessilis (L.) R.Br.ex DC. This plant from the family of Amaranthaceae has ethno

medicinal use specially to treat respiratory diseases viz. Bronchitis, asthma and other lung problem. The juice of whole plant is used. The plant also used orally to treat dysentery, diarrhoea and stomach.

***Amaranthus viridis* L :** This plant from the family of Amaranthaceac is used orally to treat fever, pain, asthma, diabetes, dysentery, urinary disorders, liver disorders, eye disorders and venereal diseases.

***Amaranthus spinosus* L.** This plant has been used orally to treat internal bleeding, diarrhea, excessive menstruation, boils, stomach disorders, ulcerated mouths, vaginal discharges, nosebleeds and wounds.

***Achyranthes aspera*-L:** This plant, from Amaranthaceae family, known as chaff flower, is used to treat bronchitis, cold, cough, pneumonia. The whole plant is used till the cure of the disease. The juice of the plant is used as medicine (Hasan, 2014). The flowering skipes mixed with a little sugar is used orally to treat dog bites. The leaves are converted into a pulp is used externally where scorpion bites. Some *kabiraj* also use the juice of the whole plant to treat boils, colic, debility, dysentery, headache, leucoderma, renal complications.

***Hydrocotyle sibthorpioides* Lmmk.:** The plant, commonly known as water pennywort, is used to treat bone fracture. The whole plant extract is grinded and applied externally where the bone fractures. The plant is also used in psoriasis, and antiviral of Hepatitis B.

***Centella asiatica* (L.) Urban :** The plant belongs to the family of Apiaceae. The common name of the plant is Indian pennyworth. Traditionally used to treat wound, gas, acidity, and dysentery.

***Colocasia esculenta* (L.) Schott. :** The plant, from Araceae family, is used to treat neurological disorders, asthma, arthritis, diarrhea, internal piles, and skin disease. The abstract of whole plant is used internally. The corn of this plant is also used to treat the body ache and baldness (Prajapati *et al.* 2011)

***Commelina benghalensis* L:** The plant, from the Araceae family, is used to treat high blood pressure, women infertility, dysentery, rashes and leprosy. Besides, paste of the whole plant is used in burns. The juice of the plant is used to treat sore throat (Kansagara and Pandya, 2019).

***Pistia stratiotes* L.:** The plant, from the family of Araceae, is known as water cabbage. The abstract of whole plant is internally used to treat eczema, leprosy, ulcers, piles, stomach disorder, throat and mouth inflammation (Khan *et al.*, 2014).

***Ageratum conyzoides* L. :** The plant from the family of *Asteraceae* also commonly known as billygoat weed, is used to treat dysentery, diarrhea, arthritis, headaches and dyspnoea, pneumonia, analgesic orally. It is also used to treat dyspea, pneumonia, analgesic and anti inflammatory. Past made of the plant is used to treat

burns wounds and arthritis (Ming, 1999).

Parthenium hysterophorus L. : The plant from the family of Asteraceae, also known as feverfew, is used to treat fever, diarrhoea, neurologic disorders, urinary tract infections, dysentery, malaria and as emmenagogue (Patel, 2011)

Mikania micrantha Willd.: The plant from the family of Asteraceae, commonly known as bitter vine, is used orally to control blood sugar. It is also used for dressing wounds and to promote the healing of sores. The paste from leaves is used to stop bleeding from wound.

Eclipta prostrata (L.) L.: The plant of the family Asteraceae, commonly known as Falsel Daisy or *Bhringraj* is used to treat liver cirrhosis, jaundice and infectious hepatitis. Leaf juice measuring 5-10 ml is used. The paste of the leaves used to treat dandruff of hair. The leaves and flower used orally to treat asthma, cough, and urinary problem. The leaves extract mixed with water is consumed to treat diarrhoea. The paste of the leaves is also used externally to treat cuts and wounds. The powder of the whole plant is suggested the elder people as a energy tonic (Sony and Sony, 2017)

Xanthium strumarium L : The plant from the family of Asteraceae is commonly known as Burweed. The extract of the whole plant is used as a tonic and digestive medicine. The powder of the seeds are used orally in treating Pneumonia (Kalita and Kalita, 2014)

Vernonia cinerea (L.) Lees.: The plant from the family of Asteraceae is commonly known as tridax daisy. The powder of the whole plant is traditionally used to treat inflammation, diarrhoea, cough, smoking cessation, asthma, Parkinson's disease and leprosy. (Shing et al 2014)

Enhydra fluctuans: the plant from the family of Asteraceae is known as Water cress and Marsh herb. The whole extract is used to treat acidity, stomach gastric ulcer and constipation (Sarma et al, 2014)

Cyperus breccifolius: Commonly known as short leaf spikesedge, the plant belongs to the family of Cyperaceae. The dry powder of the whole plant is used orally to treat stomach problem and bowel disorders.

Cyperus bulbosus Vahl.: Commonly known as wild onion, the plant belongs to the family of Cyperaceae. The powder of the whole plant is consumed to treat asthma. It prevents worms and colic of children.

Kyllinga monocephala Roxb.: this plant belongs to the family of Cyperaceae and is commonly known as *Mutha*. Paste of the leaves of the plant are used orally as anti-venom, relief of malarial chills, pruritus of the skin, thirst attributable to fever and diabetes.

Acalypha-indica-L: this plant belongs to the family Euphorbiaceae and its common name is Indian Acalypha. The whole part of the plant by making dry powder is used to treat scabies, asthma, bronchitis, pneumonia.

Euphorbia hirta L.: This plant belongs to the family of Euphorbiaceae. Its common name is asthma herb. By making the whole plant into powder, it is used to treat female disorders, respiratory ailments viz. Asthma, bronchitis, cough and coryza, worm infestations in children, dysentery, jaundice, pimples, gonorrhoea, digestive problems, and tumours.

Desmodium triflorum (L.) DC. Commonly known as three flower beggar weed, the plant belongs to the family of Fabaceae. A decoction is used orally to treat diarrhoea, dysentery. The paste of the leaves applied externally to treat wounds, ulcers, and skin diseases.

Solanum nigrum: the common name of the plant is blackberry nightshade and belongs the family of Fabaceae. The juice of the whole plant is administered to treat ulcers. The root juice is used to treat asthma, and whooping cough.

Mimosa pudica L. : the common name of the plant is sensitive plant or touch-me-not or humble plant or shame plant. It belongs to the family of Fabaceae. It is orally administered to treat urological disorders, piles, sinus and dysentery. The paste of the leaves is applied in the wounds.

A *Kabiraj* (village health practitioner) reveals that he has cured many patients of neurological disorder through making tablet from the root of the plant.

Leucas longifolia: The common name of the plant is Long-leaf leucas that is belongs to the family of Lamiaceae. Traditionally the whole plant extract has been used as antipyretic, insecticide and anti fungal and chronic rheumatism.

Leucas aspera link: the common name of the plant is *thumbai* that belongs to the family lemiaceae. The plant juice is used to treat fever. Paste of leaves externally used in scorpion bites.

Lemna minor L. : The common name of the plant is common duckweed that belongs to the family of Lemnaceae. Dried powder of the plant is used administered orally to treat oedema colds, measles, and difficulty in urination

Trapa Natans: the plant belongs to the family of Lythraceae and is commonly known as water chestnut. The extract of the plant is used to treat the problem of stomach, liver, kidney, and spleen. The extract is also used to treat gonorrhoea, menorrhagia and other genital affections.

***Boerhaavia diffusa* L.:** The plant belongs to Nyctaginaceae, and is commonly known as *Punarnava*.

The root of the plant is administered to treat anasarca, ascites and jaundice

***Ceratopteris thalictroides* Brogn:** The common name of the plant is water sprite or Indian fern. The past of the leaves used to treat skin diseases (Benniamin, 2011). The paste of the plant is also used in treating wounds and cuts. The juice of the plant is administered to treat menstrual disorders and *Diplazium esculentum* (Retz)

***Cynodon dactylon*:** The common name of the plant is Bermuda grass and the plant belongs to the family of Poaceae. The most remarkable use of the plant is it is used to treat all types of bleeding.

***P. hydropipper* L.:** The plant belongs to the family of Polygonaceae and the common name of the plant is water pepper. The plant has ethno medicinal use viz. antioxidant, antibacterial, antifungal, anti helminth, anti feedant, cytotoxicity, anti-inflammatory, antinociceptive, oestrogenicity, anti-fertility, anti-adipogenicity, anticholinesterase, and neuroprotection.

***Polygonum barbatum* (L.):** The common name of the plant is Joint weed and belongs to the family of Polygonaceae. The plant is orally administered to treat pain, fever and inflammation.

***Bacopa monnieri* (L.) Penn:** This plant belongs to the family of Scrophulariaceae and the common name is Thyme leaved graticula. The plant has ethno medicinal use to treat nervous disorders. This plant helps to promote memory and make people more intellectual. The whole plant extract is used for the treatment.

***Phyla nodiflora* (L.) Greene:** The plant is commonly known as Turkey Tangle Fog fruit that belongs to the family Verbenaceae. The plant extract is used to treat bookworm. The plant juice is used to treat fever, cold and cough.

***Alpinia allughas* (Retz.)Rosc.:** The plant belongs to the family of Zingiberaceae and the common name of the plant is Bamboo-leaved *Galanga*. The whole plant extract is used to treat bronchitis and impotence. Root extract is used to treat gastric ulcer and jaundice.

4.2. Potentiality of commercialisation of medicinal plants:

There is a huge potentiality of commercialisation of the medicinal plants in Assam as the alternative folk treatment based on medicinal plants has been very popular in Assam. The Bodo tribe has been using plants as an agent for treating various diseases viz. common fever and other kinds of diseases (Mwchahari and Nath, 2015). The tea tribe of Assam also has been using nearly 20 varieties of plants as medicine for treating common

diseases viz. cough, dysentery, fever, headache, heart problem, body pain etc. (Dutta *et. al.*, 2020). The Tai-Khamyangs tribe of Assam uses different parts of plants as folk medicine to treat some diseases. Of course, rather using a single plant, the tribe uses multiple plants to treat a single disease (Sonowal and Baruah, 2011). One of the original inhabitants of Assam is the *Mising*. The tribe of Assam uses nearly 62 plant species for treating Jaundice, malarial fever, cough, stomach ailments, menstrual problems, piles, tonsillitis, blood purification, and skin diseases etc. (Ayam, Doley and Sing, 2017). The study of Teron and Borthakur (2013) reveals that the *Karbi* tribe uses nearly 54 medicinal plants for healing different health issues. Two local Kabiraj (traditional health practitioners) viz. Boga Ojah and Ambika Sarma use plants to treat some diseases. Boga Ojah treats night fall of the young male and the problem of nervous system. Likewise, *Kabiraj* Ambika Sarma use some local plant based medicine to treat herpes. The patients who took the treatment from Boga Ojah and Kabiraj Ambika Sarma and they got cured by taking the treatment from the *Kabiraj*.

Acharya Pankaj Pathak, a popular plant based folk medicine practitioner uses number of plants for treating different health issues. He purchases the medicinal plants from the markets within the state as well as from other states. He has appealed to the local people to cultivate different medicinal plants and he assured that he would purchase at the market rate. One of the farms of Swami Ramdev has been established in Assam that produces different herbal medicine. The farm purchases the raw materials from the local markets of Assam. Thus it is found that there is huge potentialities to cultivate the medicinal plants and can get engaged.

V. CONCLUSION:

As it is mentioned in the introduction that Assam is famous for her rich biodiversity. The heterogeneous tropical area, wetlands, rivers, hills make the state very rich in her bio-diversity. Most of the plants found in Assam have medicinal value. Different studies have recognised it. But this study is a novel one as the study has undertaken the interview both the village medicinal practitioners (*Kabiraj*) and the patients to authenticate the claims of the village *Kabiraj*. Further studies are needed covering different tropical and aqua final areas of Assam. Assam is a land where different tribes and communities live with their own cultures and traditions. Every tribes use ethno medicine in their diseases. More studies are needed that can cover all these community based ethno medicine. Besides, there is more scope to commercialise the production of ethno medicine. Further study can be done from these prospects too. However there are some limitations of the present study. Firstly, the study has covered only one wetland. There is a scope of inclusion of more wetlands of the district. Secondly,

the study fails to identify to the actual extract of the plant that is responsible for curing the diseases. Thirdly, this study did not cover if there is any side effect of the use of the ethno medicine by the patients. The *Kabirajs* reveal that *Kapla Beel* was more rich for its plants diversity with unique medicinal value. However, due to human interference and due to change of climate, some medicinal plants have been disappeared from the *Beel*. It is seen that people of the surrounding villages are not aware regarding conservation of the diversified medicinal plants. There is a potentiality of in-situ conservation of different medicinal plants if the department has a proper plan.

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