IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 8, April 2026
Impact Factor: 8.2

Ethno-Medicinal Uses of Some Aquatic Plants of Churachandpur District, Manipur, Northeast India

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Abstract: *Ethno- medicinal uses of aquatic plants have been in used since time immemorial in Churachandpur district. But it has been increasingly neglected due to the socio- economic changes and modernisation of life styles. Hence, the present study has been taken up to bring forth the idea of indigenous usage of various aquatic edible plants. They were found growing in ponds, moist soil along rivers, streams, drying moist lands and flooded fields. Altogether, nine ethno-medicinal aquatic plants were reported from different places of Churachandpur district. Euryale ferox, Nelumbo nucifera, Neptunia oleraceae and Nymphea pubescens were found growing only during the rainy season. While the remaining like, Alocasia, esculenta, Centella asiatica, Colocasia esculenta, Houtuunia cordata and Ipomea aquatica were found growing throughout the year although, the leaves and stems dried up in the winter months leaving behind only the underground roots. The plants were all edible with medicinal uses. Different plant parts i.e., the leaves, stems, fruits and roots were studied for their medicinal purposes. These aquatic plants also serve as a source of income to many rural people, who cultivates them and market them locally. The trading is done by womenfolks.*

Keywords: Aquatic plants, Churachandpur, medicinal

INTRODUCTION

Plants that grow in water, in soil covered with water or in soil that is usually saturated with water are called aquatic plants (Weaver and Clements, 1938). Muenscher (1944) considered aquatic plants as “those species which normally stand in water and must grow for at least a part of their life cycle in water, either completely submersed or immersed”. Reid (1961) described aquatic plants as “whose seeds germinate in either the water phase or the substrate of a water body and which must spend part of their life cycle in water”.

Aquatic plants hold remarkable forms of plant life that provide livelihoods for millions of people living within and around aquatic ecosystems. Economically, a large number of aquatic plants are valuable for their medicinal as well as food uses. Different plant parts such as rhizomes, tubers, roots, fruits, and leaves are utilized in different ways, including the treatment of various ailments (Bhunia and Mondal, 2009; Shankar and Mishra, 2012). They play multifarious roles in nutrient rotation, sediment stabilization, and the provision of foods and habitats for a variety of fishes and other animals (Chambers *et al*., 2008; O’Hare *et al.,* 2017). They are fundamental components of freshwater ecosystems, providing essential ecological functions such as oxygen production, sediment stabilization, nutrient cycling, and enhancing physical habitat complexity for a wide array of organisms. There has been no report of work done in Churachandpur district. Not only that, aquatic plants and their habitats are very fragile due to dams and diversion, modern agriculture, irrigation, pollutants and also biological invasion. If research steps are not taken timely, species are going to extinct very rapidly before scientific documentation. Therefore, the present study aims a thorough survey of ethno-medicinal uses of aquatic plants of Churachandpur district, Manipur, northeast India.

DOI: 10.48175/IJARSCT-33809

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II. STUDY SITE AND METHODS

The study site selected is Churachandpur district in Manipur, northeast India. Churachandpur district occupies the south-west part of Manipur state. It stretches between 93° 15'E and 94° 45′E Longitude and between 24°N and 24° 30 N Latitudes. It has 4570 Sq.Km geographical area constituting 20.47% of the total geographical area of the State and it is the largest district of Manipur in terms of area. It is bounded by Jiribam Sub division of Imphal East, Tamenglong District on the North, Bishnupur and Chandel District on the East Myanmar (Burma) and Mizoram state on the South and Cachar District of Assam on the West. The topography of the district is hilly. The district got its name "Churachandpur" from the Manipur king Churachand Singh. The District Headquarter, Churachandpur, which is the second largest town of the state, is situated at a distance of 64 kilometres from the State capital – Imphal. The district is inhabited by different tribes as: Kuki-Thadou, Paite, Hmar, Lushai, Zo, Vaiphei, Gangte, Kom, Chiru, Simte. The inhabitants possessed diversed culture with more or less similarity. Consumption of aquatic plants by the local inhabitants is one important feature of the area. They are consumed mostly as essential, sustainable and nutrient dense food sources particularly during rainy seasons.

The survey areas were seasonal and permanent water bodies, flood plains, rivers, ponds, and streams. The present work was based on a field survey. Local people inhabiting around the water bodies were interviewed and group discussions were conducted to understand the type of plants, parts of plants, used as food, vegetables and medicines. Semi-structured interviews were conducted among a wide array of farm labourers, women vegetable vendors, local herbalist to obtain maximum information related the present study. Specimens of species occurring in different places were observed and collected from time to time for preparation of herbaria. The plants have been identified from fresh materials with the help of different Floras (Prain, 1903; Mondal, *et al*., 1998).

III. RESULTS AND DISCUSSIONS

Nine ethno-medicinal aquatic plants were reported from the study site (Table 1).

Table 1: Ethno-medicinal aquatic plants of Churachandpur district, Manipur, northeast India

Sl. No.	Botanical name	Family	Habit, habitat and growing season	Ethno-medicinal uses
1	***Alocasia indica* (Roxb.)Schott**	Araceae	The corms or roots are used as a substitute for potato. The tender stems and leaves are fermented and dried for off seasons.	The plant is rich in fibre which helps in constipation and gut health. It is rich vitamin C and polyphenols, which helps in fighting free radicals, reduce inflammation, and boost immunity. Leaf paste is applied locally as poultice for boil and infection. It is used as iron supplements to anaemic patients.
2	*Centella asiatica*	Apiaceae	It is a perennial herb on damp or wet muddy underground, and paddy field. The whole plant is cleaned from soil debris and boiled. It is also prepared with chillies, fermented dry fish and salt as side dish. The	It is popularly used in skin care to treat acne, psoriasis, eczema and to strengthen the skin barrier. It has antibacterial properties and used in the treatment of urinary tract infection. It has the ability to reduce inflammation, protecting against chronic diseases. Helps in improving circulation and high blood pressure.

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			soup is also taken separately. It grows throughout the year, but the best time for cultivation is rainy season.	It acts as an antioxidant, anti-inflammatory and also for boosting collagen production. Used to treat stomach ulcers and protect gastric lining from damage.
3	*Euryale ferox*	Nymphaeaceae	The immature fruits and seeds are eaten boiled, raw in salad, or used in chutney. It also serves as a crucial commercial crop in Manipur, contributing to the local economy. March to September is the peak growing season.	The seeds are low in fat and calories but packed with essential nutrients, making them a healthy, easily digestible food. Traditionally, it is known to treat diabetes. It acts as an anti-aging agent and has antioxidant, cardio-protective, and hepatoprotective properties. It helps with arthritis, rheumatism, and insomnia. The rhizome is used to treat jaundice and skin infections.
4	*Houttunia cordata*;	**Saururaceae**	It is called 'fish mint' as it has a fishy smell. It is made as salad with different mixture of vegetables and mostly as chutney. It grows best from May to June with peak harvesting in June. The foliage and stems die back in winter and roots regenerate in early spring.	The extract is used for relieving cough and sinus. Inhaling boiled leaves is used as cure for lung infection. It is also reported that during the Covid -19 pandemic, patients inhaled the steam to cure from Covid-19 virus. For improving discomfort due to piles. The leaves are crushed and taken as drink to improve cataract. It is also used for kidney stone removal.
5	*Ipomoea aquatic*	Convolvulaceae	The stem is hollowed that float on water or creep over moist soil, often found along rivers and flooded fields. It produces trumpet-shaped flowers that are usually white or pink-lilac, with a purple center. The leaves and young stems are prepared with chillies and salt as side dish.	The leaves have high content of iron and essential amino acid. It is used as anti-diabetic properties in traditional medicine. It also contains vitamins A, B, C, E, and K.

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			It thrives year-round in hot climates, with peak production during summer and early fall.	
6	*Nelumbo nucifera*	Nelumbonaceae	It is an aquatic perennial plant. The seeds, leaves, and stem of the lotus are all edible. The flowers are used as garnish, the leaves as food wraps, and the underground stem (rhizome) as a soup or stir-fry ingredient. The stems and root are properly washed and cleaned. They are sliced, sometimes boiled and marinated or dipped in a chutney made from coriander, chillies, mint, salt and fermented fish. It grows best from the early spring to late autumn, with peak activity occurring during the hot summer months.	Lotus roots are highly nutritious and have been found to be rich in dietary fibre, vitamin C, potassium, thiamin, riboflavin, vitamin B6, phosphorus, copper, and manganese and very low in saturated fat They are used as astringent, cardiotonic, febrifuge, hypotensive, resolvent, stomachic, styptic, tonic and vasodilator. In addition to presence of alkaloids nuciferine, aporphine, coclaurine and norcoclaurine, the plant is found to contain the flavanol miquelianin.
7	*Neptunia oleraceae*	Fabaceae	*It is a perennial, nitrogen fixing* aquatic legume that grows in shallow waters, often cultivated in rice fields or wetlands for its young stems and leaves. The peak growth is during the rainy season.	It is used in the treatment of gastrointestinal health. The leaves juice is used as ear drop to alleviate ear infection. It is also used in syphilis and other skin related problems. The leaves are used as an antipyretic, while the plant is also used to treat jaundice and leucorrhoea.
8	*Nymphaea pubescens*	Nymphaeaceae	The rhizomes are harvested from flooded ares during	The plant contains phytochemicals such as, alkaloids, saponins, tannins,

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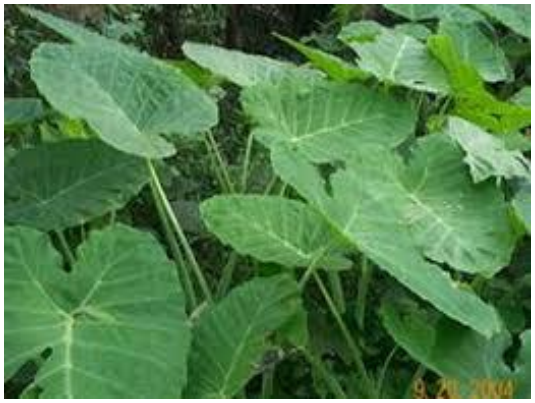
			rainy season and cooked as vegetables. The seeds, are high in protein, starch. They are roasted or fried and ground with oil. Young peduncles and flowers are also consumed as vegetables. It grows during August to January.	and glycosides and contributes to its therapeutic potential. It is utilized to treat diarrhea, dysentery, piles, hemorrhages, indigestion, fever, and kidney-related issues like cystitis and nephritis.
9	*Polygonum plebeium*	Polygonaceae	Commonly known as small knotweed or prostrate knotweed is a widespread, prostrate annual herb that typically grows in disturbed, periodically waterlogged, or moist habitats. It is commonly found on the banks of rivers, streams, and canals, as well as on drying mudflats, lake sides, and pond beds. It contains polyphenol, flavonoids. It grows during the months of October to May.	Crushed leaves and young stems are used to treat lung infection, pneumonia. The roots are used to treat stomach disorder. For expulsion of worms. It has antibacterial, anti-inflammatory properties. For relieving nausea. It helps in improving lactating mothers.



Alocasia esculenta (L.) Schott.

Stem

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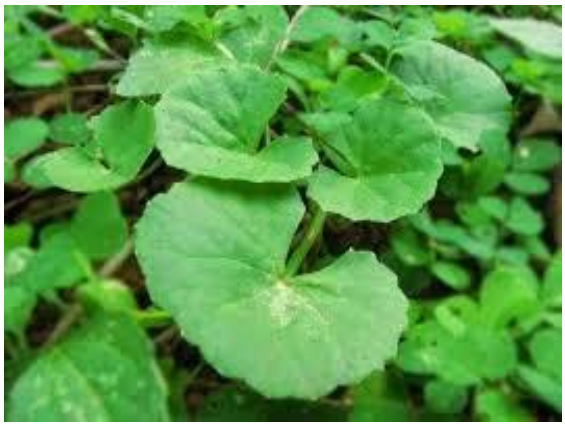
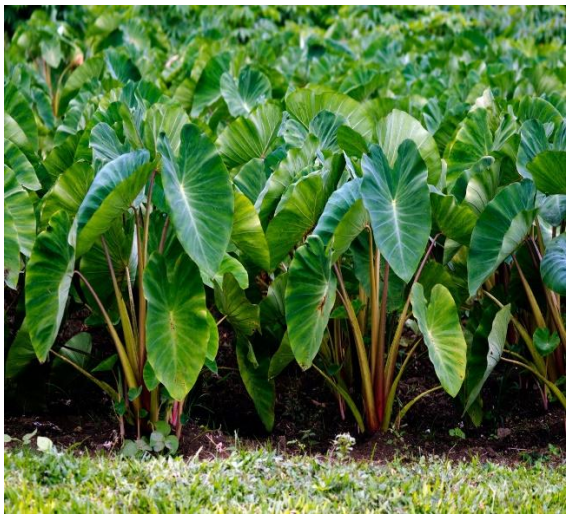
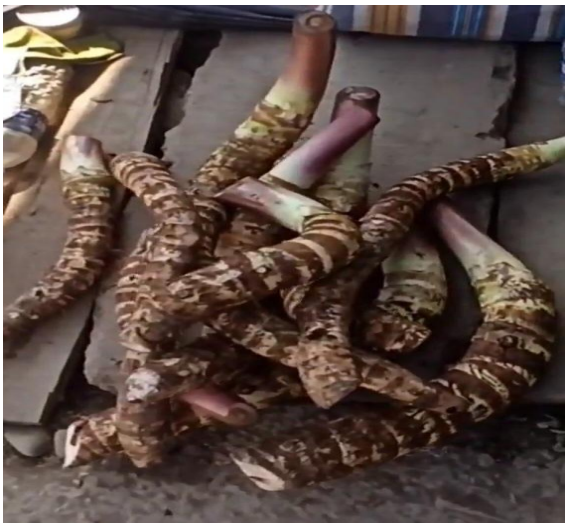


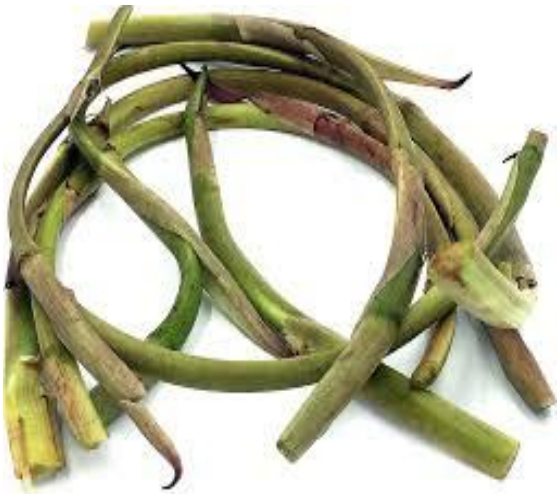
Centella asiatica



Colocasia esculenta



Tuber



Stem

Euryale ferox

Fruits

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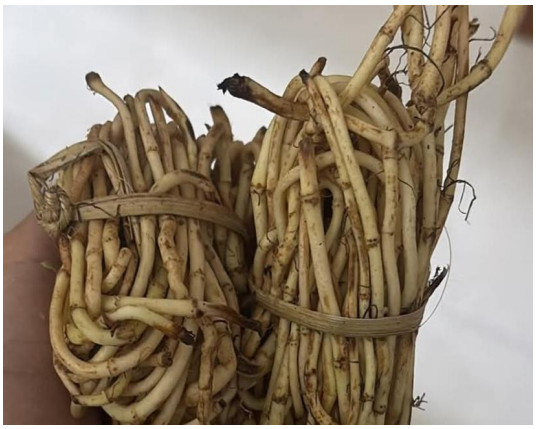
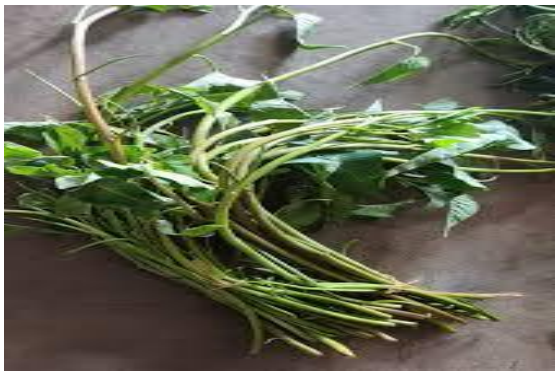
Houttunia cordata Leaves

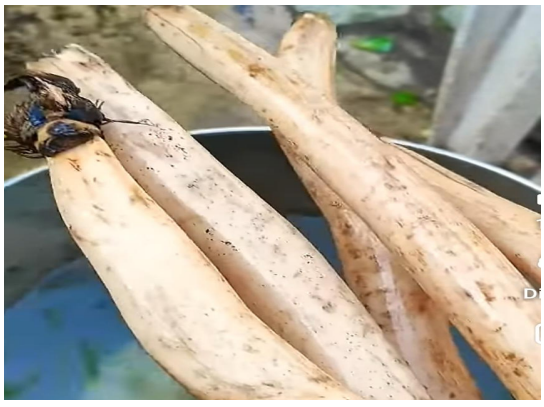


Roots



Ipomea aquatica

Nelumbo nucifera



Stems

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Neptunia oleraceae


Nymphea pubescens

Polygonum plebeium

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The aquatic plants reported were found to grow mostly during the rainy season. *Alocasia, esculenta, Centella asiatica, Colocasia esculenta, Houtuunia cordata* and *Ipomea aquatica* are present throughout the year round but, the leaves and stems dried up in the winter months leaving behind only the underground roots. They served an important dish in all households that ensures both affordable food and nutritional security. They are also sold in the local market by the womenfolks to earn their livelihood. Inspite of their uses, there were reports that the aquatic plants faced threats from modern agriculture, irrigation, herbicides, pesticides from farmers, pollutants from upstream, fillings of wetlands and lack of awareness are noteworthy.

Aquatic plants offer a promising solution to the environmental health, ethno- medicinal values associated with traditional practices. Continued investment in research and development is essential for improving the nutritional quality of aquatic plants. Governments and regulatory bodies can support the growth and development of the aquatic plants in the study area.

ACKNOWLEDGEMENT

The author is grateful to the Department of Botany, Churachandpur College and the local inhabitants of the study site for the information they shared.

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