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## Folk medicinal uses of wetland macrophytes in Darbhanga district of North Bihar

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### Abstract

Wetland of Darbhanga district provide livelihood for the people who live around them. Even today man of rural area of this district depend upon wetland for multiple purposes. The aquatic plants played fascinating role in the life of human beings in earlier days with respect to medicinal purposes. An ethnobotanical survey was conducted for the purpose of determining the value of traditional remedies by using the standard methods for identifying, exploring medicinal values of aquatic plants in this area. In present paper an attempt has been made to study of aquatic macrophytes used to treat some diseases of rural as well as urban population. Darbhanga district lies between 25° 42' to 26° 27' north latitudes and 85° 40' to 86° 25' east longitudes. The district covers a total area of 2502 sq km. The climate of this district is on the whole dry, hot in summer and cold in winter. Darbhanga district is known as lands of *chaurs* (land depression caused by changing river courses over millennia) *moins* (ox-bow-lakes), *marandhar* (dead river channels) and several other man made pond, lake etc, besides a large area gets flooded during rainy season. By the advancement and modernisation of life pattern the usage of wetland plants are foregone and treated as weeds. The aquatic and semi-aquatic plants of Darbhanga district are rich repositories of various plant species such as *Euryale ferox*, *Nelumbo nucifera*, *Trapa natans*, *Centella asiatica*, *Cyperus rotundus*, *Ipomoea aquatica*, *Vetiveria zizanioides*, *Acorus calamus*, *Asteracantha longifolia*, *Ranunculus sceleratus*, *Ottelia alismoides*, *Rumex dentatus*, *Polygonium hydropiper* etc. Undesirable side effect of the existing drugs, there is an increasing demand by patients for use of natural products. Herbal plants are widely used even though their biologically active compounds are unknown or lesser known. More than dozen of aquatic macrophytes in the district are significant in medicinal purposes.

**Keywords:** macrophytes, north Bihar, medicinal, wetland

### Introduction

Human beings have been dependent on plants for their health care needs since the very beginning of human civilization. The folk medicine in various countries gave rise to traditional systems of medicine (Anonymous, 1948, 1962) <sup>[1]</sup>. Over population, change in life style, malnutrition and environmental pollution in recent years have contributed to general deterioration in the health of the people. There are, thus, immense opportunities to use plant derived products in the treatment of diseases according to the principles of traditional medicine. Throughout the world today, specially in India, people recognize the value of medicinal plants in treating and preventing common diseases (Das, 1972) <sup>[5]</sup>. In India use of herbal ingredients for the treatment of different kinds of diseases has a long tradition and is often recommended in indigenous systems of medicine such as Ayurveda, Unani, etc. (Chopra *et al.*, 1982) <sup>[4]</sup>. In Darbhanga district thousands of rural household use medicinal plants in a self help mode. The present study is carried out on the medicinal values of some wetland macrophytes used traditionally in the treatment of acute or chronic diseases specially rural area in Darbhanga district of north Bihar.

### Materials and methods

Round the year observations were made on the aquatic & semi- aquatic macrophytes found in and around the Darbhanga district and plants of ethnomedicinal importance were identified for their diverse usages. Herbarium specimens were prepared as per standard procedure and proper identification was made through consultation of taxonomic literature on this group of plants. In order to enumerate the medicinal value of wetland macrophytic plants, distribution, different localities and collecting spots were surveyed. Different usages of medicinal plants (Khare, 2007) <sup>[11]</sup> in Unani and Ayurvedic system were noted (Sen and Nagendra 1999) <sup>[10]</sup>.

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Authenticity of different types of plants used for the treatment of diseases and mode of preparation of drugs was confirmed with the help of local people, medicinal treatise and different system of medicines.

### Results and discussion

The present studies are mainly confined to collection and information about macrophytic plant and their popular use as household remedies by the local people of Darbhanga district. Each and every mentioned plant is useful in some way or other because they are untapped reservoirs of drug. The structural diversity of their chemical components makes them a valuable source of drug that control several metabolic disorders and microbial infections. In recent time there has been a market shift towards herbal cures because of the pronounced cumulative and irreversible reaction of modern synthetic drugs.

Bach (*A. calamus*) dried rhizomes are used for treatment of chronic diarrhoea, dysentery and bronchial catarrh. Rhizome of *Buch* is also used as nerve tonic. In some villages of Darbhanga district, juice of this plant is put on the tongue of an infant child on the six day of his/her birth, the practice is related with testing the possible defect in speech. Brahmi (*C. asiatica*), a miracle herb having neurotonic properties (Balakumbahan, *et al.* 2011) [3]. This herbal plant has ascorbic acid as its natural ingredients can thought to destroy scavenging free radicals and less on oxidative stress to considerable extent (Si, *et al.*, 2010) [9]. On the other hand the

leaves of this plant is used as memory tonic in this area. It is generally the students who prefer to make extracts of the leaves and petioles together and drink the same in the form of *sharbat*. Kamal (*N. nucifera*) fruits and seeds are used to control of heart and diabetic diseases (Huralikuppi, *et al.*, 1991) [8]. Vetiver plant use described in Ayurvedic system and its oil provides relief from rheumatism, headache on local application. The root part of the plant is now being used as refreshing drink. Eating raw Singhara (*Trapa natans*) seed contributes nutritious value (Jha, 1999) [12]. *E.ferox* pops used for control of spermatorrhoea. *C.rotundus* rhizome is starchy, rich in vitamins and minerals, hence used as vegetable. Raw rhizomes also used against diabetes. The fried leaves of *Laquatica* are taken to cure anaemia, leaf is a purgative and act as blood purifier. It has been found that leaves of *Ranunculus sceleratus* are used for control of scabies while those of *Polygonum hydropiper* are used as intestinal wormicides. The leaves of *Rumex dentatus* are also eaten for tonic purposes. It is understood to control the deficiency of vitamin A and calcium and *Astearcantha longifolia* leaves are useful for control of anaemia and menstrual disorder Muthulingam (2010) [15]. The leaves of *Ottelia alismoides* are consumed with a view to enhance blood circulation and to provide redness to skin. Information gained on folk medicinal uses of wetland macrophytes of Darbhanga district along with botanical name, family, english and local names has been listed in table-I and table-II.

**Table 1:** Folk medicinal uses of aquatic macrophytes

Sl. No.	Botanical Name of Plants, Family and Local Name	English and local names	Nature of plant	part	Purposes
1	<i>Euryale ferox</i> Salisb. Nymphaeaceae	Foxnut/Gorgonut (Makhana)	Rooted floating	Seed/pops/seed coat	For control of Spermatorrhoea, seed shell used against diabetes
2	<i>Nelumbo nucifera</i> Nelumbonaceae	Lotus (kamal)	Rooted floating	Seed/rhizome	For control of heart disease and diabetes
3	<i>Trapa natans</i> Trapaceae	Water chestnut (Singhara)	Rooted floating	Fruit	Flour of dried karnels is used in bleeding disorder, source of minerals, Fruit peel used in diabetes. (Das et al, 2011)[6]
4	<i>Ipomoea aquatica</i> Convolvulaceae	Water spinach (Karmisaag)	Rooted floating	Leaves and young stem	Control of anaemia and against diabetes.
5	<i>Ottelia alismoides</i> Hydrocharitaceae	Duck lettuce (Kauathutthi)	Partially or fully submerged floating	Leaf	Enhance blood circulation and provide redness to skin

**Table 2:** Folk medicinal uses of semi-aquatic macrophytes

Sl. No.	Botanical Name of Plants, Family and Local Name	English and local names	Nature of plants	Part	Purposes
1	<i>Ranunculus sceleratus</i> Ranunculaceae	Buttercup (Jaldhania)	Rooted emergent	Leaves	Scabies and other skin diseases
2	<i>Centella asiatica</i> Apiaceae	Pennywort (Brahmi)	Rooted trailing	Leaf and petiole	As memory tonic
3	<i>Acorus calamus</i> Acoraceae	Sweet flag (Buch)	Rooted emergent	Rhizome	Treatment of chronic diarrhoea, dysentery, bronchial catarrh, nerve tonic and antidiabetes
4	<i>Vetiveria zizanioides</i> Poaceae	Vetiveria (Katra ghas)	Rooted emergent	Root	Rheumatism ,headache, control of lice, skin disease and as refreshing drink
5	<i>Cyperus rotundus</i> Cyperaceae	Nutgrass (Motha)	Rooted emergent	Rhizome	Source of vitamin, minerals and against diabetes
6	<i>Asteracantha longifolia</i> Acanthaceae	Hygrophila (Tal makhana / Gokhura)	Rooted emergent	Leaves	For control of anaemia, menstrual disorder and diabetes
7	<i>Polygonum hydropiper</i> Polygonaceae	Water pepper (Bisnari)	Rooted emergent	Leaves	Against intestinal wormicides
8	<i>Rumex dentatus</i> Polygonaceae	Tooth dock (Ban Palak)	Rooted emergent	Leaves	As tonic to control deficiency of vitamin and calcium

## Conclusion

Aquatic plants incorporated in this paper are good source of herbal treatment and as such there is a need to encourage future traits for better identification of potential candidates for treatment of different diseases and complications. Herbal remedies of diabetes have been mostly confined to the terrestrial plants and relatively little attention was paid to the aquatic plant. Aquaphytes like Bach (*A. calamus*), Karmisaag (*I. aquatica*), Kamal (*N. nucifera*), Motha (*C. rotundus*) and Tal makhana (*A. longifolia*) etc. have been found to be in possession of hypoglycemic properties which are also used as subsidiary food by the indigenous populations. (Jha, *et al.*, 2012) [13] People residing alongside the pond, lake in almost the state of Bihar are in the habit of utilizing *Ipomoea aquatica* as leafy greens which is useful in anaemia and diabetes (Hamid *et al.*, 2011) [7]. There is a need to make people aware of the medicinal properties of the aquatic plant. Bihar can play a major role in the production of aquatic medicinal plants with the vast human resources in the form of farmers labours and water resources.

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