



## **8. Look Over Four Dicot Aquatic Angiospermic Families of Darbhanga**

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### **ABSTRACT**

*The present paper is lookover of dicot aquatic angiospermic families are growing through Darbhanga and nearby Darbhanga. A brief description are given along with uses. A total number of species are 18 under which 14 genera and 4 are identified as families. A brief taxonomic account of each species is given with local name, family and uses.*

### **KEYWORDS**

*Aquatic, Angiospermic, Darbhanga.*

### **Introduction:**

Darbhanga district of North Bihar is known for its rich angiospermic flora. Angiospermic flora are of monocot and dicot types. These rich flora has not received much attention. Our knowledge is based on admirable works done by biswas and calder (1937), Mirashu(1954), Mojumbar (1965), Sankar and Mishra (2012), Deka and Devi (2015). Some Workers like hains (1921-25), Monney (1950), Shrivastava (1956a-1956b), Sanjal (1957), Saxena (1976a, 1976b), Krishna (1997) Bimal.et.al(1991) works in Bihar but their findings are mostly based on terrestrial plant. This paper looks over some important aquatic dicotyledons families of Darbhanga. Some important families are observed as Ranunculaceae, Nymphaeaceae, Elatinaceae, Tiliaceae, Momosaceae, Fabaceae, Rosaceae, Onagraceae, Trapaceae, Rubiaceae, Asteraceae, Hydrophyllaceae, Scrophulariaceae, Amaranthaceae, Polygonaceae and Ceratophyllaceae. But the major plants were observed in below four families:

1. Nymphaeaceae
2. Asteraceae
3. Scrophulariaceae
4. Polygonaceae

The paper is a small effort to put light on the plants and their habit, habitat and their uses. In this, the water bodies of Darbhanga and nearby Darbhanga are overlooked.

## **Material and Methods:**

North Bihar Darbhanga is rich in fine network of rivers emanating from Himalayas, large number of other natural and manmade water bodies, thousands of ponds, tanks, chauras and moins. Darbhanga cultural moorings are based around water bodies. During the vast stretch of the aquatic habitats of Darbhanga district it is desirable to make proper investigation by selecting certain specified areas with limited boundaries to overlook extensively.

Methods to overlook the aquatic dicot plants, several field trips were arranged in Darbhanga and neighboring areas of Darbhanga block. Water bodies of different types are surveyed in all the seasons to collect plant in fruiting and flowering season. Its habit, habitat, colour, flower, special uses were recorded into field notebook. Collected specimens were mounted and herbarium was made. Each specimen were labelled as data pertinent to field number, botanical name family, local name, place of collection, botanical name, brief diagnostic description uses. Fresh specimen, dedicate flowers and large plants parts like tubers, rhizomes, corms fruits etc, which could not be mounted on herbarium. Sheets are preserved in jars following customary preservative methods. A large number of local habitants were interviewed to gather information. Information collected was compared with published literature (Subramanyam 1962). Identification of taxa was done with the help of herbarium of botany department and relevant floras and literature. The literature used are BBO, FBI, FI Delhi. All the collected plants on which this overlook is based has been deposited in herbarium of department of Botany.

## **Results and Discussion:**

Results obtained from field surveys, summarized four major number of plant species family. Basically the overlook is based on four dicotic families. Total number of species are 18, Under which 14 are Genera and 4 belongs to dicotic family. The collected aquatic dicotic angiosperms are as follows with their families:

### **1. NYMPHACEAE**

#### **Plant Names:**

##### **a. *Eurayle ferox* Salisb.**



Vernacular Name: H. - Makhana.

**Local Name:** Makhana.

**Morphological Description:**

A perennial, densely prickly, aquatic herb with thick, short, black root stock. Leaves floating, flower violet, fruit berry.

Fl. & Fr.: February-May.

**Field Notes:**

Makhana, a cash crop of the region, grows in shallow water bodies

**Uses:**

Makhana serves as a dessert delicacy and is effective against deficiency disease like beriberi, cardiac stimulant, binding action in dysentery, anti-rheumatic, anti-diuretic. It also serves as a source of starch for textile industry. North Bihar is the chief producer of makhana, contributing as much as 90% of the total production in the country.

Approximately, 2000 tons of popped makhana worth Rs. 10 crore is exported outside north Bihar every year (Kargupta and Jha, 1996). Out of the total production of makhana from north Bihar, Darbhanga district contributes 32%, Madhubani 30%, Saharsa 15% while the rest is contributed from Katihar, Araria, Madgepura, Purnea, Khagaria and Champaran districts.

**b. *Nelumbo nucifera* Gaertn. (SACRED LOTUS, INDIAN LOTUS.)**



Vernacular Name: S.-Ambuja, pankaj, padam, pankaja,; H.- Kamal, kanwal.

Local names: Padma, Kamala.

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**Morphological Description:**

A large perennial herb with a stout, creeping, underground rhizome embedded in the mud. Leaves 25-30cm across, alternate, when matured raised high above the water surface, orbicular, centrally peltate, margin entire, prominently veined from the center; petioles covered with minute prickles. Flowers large, solitary, attractive, fragrant, pinkish-red or white emerging from the rhizome.

Fl. & Fr.: June-October.

**Field Notes:**

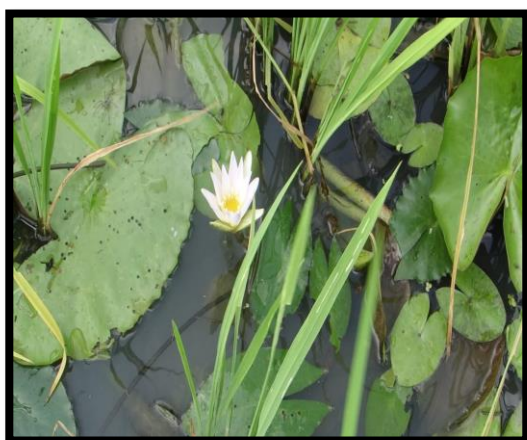
It is commonly seen growing in ponds and tanks of Darbhanga district, chiefly in association with *Pistia stratiotes*, *Lemna purpusilla* and *Nymphoides indicum*.

Parts Used: Rhizomes, leaves, flowers, seeds.

**Uses:**

This is the sacred Indian Lotus flower, “Padma”, offered to Lord Brahma, Goddess Lakshmi, Maa Durga. The flowers are used as a cardiac tonic, in fever and diseases of liver; the seeds form a cooling medicine for skin diseases; and rhizomes in the powdered form are prescribed for piles. Honey produced by bees that visit lotus flowers, is called ‘padmamadhu’ or ‘makaranda’ and is used for eye disorders. Young leaves, petioles and flowers are used as vegetables. The fruiting torus “Kamalgatta” is highly nutritious and prescribed as energy food especially for pregnant women. The most common used item of the lotus plant, however, is its leaf used as a wrap for food and even as food plates.

**c. Plant Name: *Nymphaea nouchali* Burm. f.,**



Vernacular Name: H. - Kumudani.

Local Name: Kumudani.

**Morphological Description:**

An aquatic floating herb rooted at the base. Leaves 20-25 cm across, sub-sagittate when young, older leaves sinuate and toothed, pubescent beneath. Flowers variable in size and colour, pink to deep-red, opening in the morning.

Fl. & Fr.: Almost throughout the year, particularly in rainy season.

**Field Notes:**

Very common; floating in shallow water ponds, railway ditches, roadside canals and nalas, inundated rice fields, associated with other aquatic plants. Often planted as an ornamental aquatic in gardens.

Parts Used: Rootstocks, flowers and seeds

**Uses:**

Flowers are used by the Hindus for religious purposes.

In fish culture ponds these rhizomatous plants draw the soil nutrients and hampered the fish growth. Flowers are white, blue, pink or purple, slightly scented.

**d. Plant Name: *Nymphaea stellate* Willd.**



Vernacular Name: S.: Nilotpal; H. - Nilkamal; Nilpadma.

Local Name: Bhent.

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**Morphological Description:**

A large floating herb; rootstock creeping, attached to the substratum (soil). Leaves orbicular or elliptic.

Fl. &Fr.: September-November

**Field Notes:** Very common in ponds, tanks and lakes.

Parts Used: Whole Plant.

**Uses:** Rhizomes, tender leaves and flower peduncle are used as vegetable. Also used for ornamental purposes.

**2. ASTERACEAE**

**Plant Names:**

*a. Caesulia axillaris* Roxb



**Morphological Description:**

An erect or procumbent, semi-aquatic annual herb. Leaves sessile, lanceolate, acuminate, base auricled. Head white or light purple.

Fl. & Fr.: August - February.

**Field Notes:**

Abundantly found in paddy fields, also in marshy places and near canals, chiefly in association with *Ammania baccifera* and *Rumex dentatus*.

**Uses:**

Useful in jaundice, liver diseases and as anthelmintic.

**b. *Centipeda minima* Linn**



**Morphological Description:**

A prostrate much branched glabrous annual herb like Leaves sessile, disciform, yellow, outer female florets, disc florets bisexual.

Fl. & Fr.: November-March, also continues where moist conditions favour it.

**Field Notes:** found along the margins of ponds and in ditches.

**c. *Eclipta alba* Hassk.**



Vernacular Name: -*Bhringraja*, *Kesarraja*: H. -*Bhangra*.

Local Name: Bhangra.

**Morphological Description:**

An erect or prostrate, much branched, rough, annual herb like Leaves opposite, sessile, Flowers heads white.

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Fl. & Fr.: Throughout the year.

**Field Notes:**

Commonly found in open pastures, along the margins of nalas, ponds, ditches, pools and in other moist localities.

Parts Used: Whole Plant.

**Uses:**

“Bhringraj” is used as liver tonic, chronic skin diseases, ear ache, stop greying of hair, jaundice, tooth ache, whooping cough.

**d. *Enhydra fluctuans* Lour.**



Vernacular Name: H.-Harkuch.

Local Name: Hinch.

**Morphological Description:**

An erect, floating, glabrous, marshy, annual herb upto 25-50cm high like Stem cylindrical, Leaves opposite, flowers bisexual.

Fl. & Fr. Major part of the year.

**Field Notes:**

Commonly found in ponds with their floating stem on the surface of the water and also in marshy places.

Parts Used: Leaves.

**Uses:** Leaves are used as a laxative, also eaten as vegetable. Also used as a pot herb because of its blood purifying property.



**e. *Sphaeranthus indicus* Linn**



Vernacular Name: S.-Mundirika; H-Mundi.

Local name: Mundi.

**Morphological Description:** Annual herb, Leaves sessile, alternate, Flower bisexual.

Fl. & Fr.: January- July.

**Field Note:** Abundant in rice fields and damp grounds.

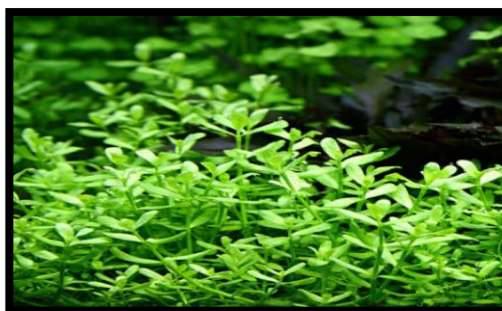
Parts Used: Whole Plant.

**Uses:** The plant is used medicinally as a bitter tonic and also as vermifuge.

**3. SCROPHULARIACEAE**

**Plant Names:**

**a. *Bacopa monnieri* (Linn.)**



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Vernacular Name: S. - Saumyalata; H. - Brahmi, Jalnim.

Local Name: Brahmi.

**Morphological Description:**

Creeping, annual herb, Leaves simple, opposite. Flowers are bluish-purple or White

Fl. & Fr. Throughout the year

**Field Notes:**

A common marshy or semi-aquatic herb found throughout the district. Often gregarious and forms pure strands near wells and drains where soil is rich in organic matter.

Part Used: Whole Plant

**Uses:**

The plant is considered a blood purifier. The plant contains an alkaloid Brahmine, which is a cardiac tonic, i.e. provides strength and tone to the heart (Jain, 1996)

**b. *Celsia coromendeliana* Vahl.**



Vernacular Name: S. – Bhutakeshi

**Morphological Description:**

An erect, branched or unbranched plant. leaves rosette-forming. Flowers yellow in simple or branched

Fl. & Fr.: January-May.

**Field Notes:** Fairly common in sandy beds of river in moist sandy places. An attractive herb in full bloom. Leaves when bruised smell like Mitha- neem.

Parts Used: Leaves.

**Uses:** Plant juice prescribed in skin eruptions and fevers (Chopra et. al., (2006).

**c. *Linnophila indica* (Linn.) Druce**



Vernacular Name: S.: Amargandhah.

**Morphological Description:** A small erect or prostrate herb. Roots creeping. Stems much branched. Leaves dimorphic. Flowers are white or purplish.

Fl. & Fr.: September-February.

**Field Notes:** Common; generally found in shallow ponds and ditches, marshy places and in rice fields. The plant has an aroma of turpentine.

Parts Used: Whole Plant

**Uses:** The plant is considered as an antiseptic and when made into a liniment with coconut oil is used in elephantiasis. Twig paste is applied in hair. The juice of the plant is rubbed over the body in fevers. It is also given in dysentery with ginger, cumin or other aromatics (Chopra et al., 1956).

**d. *Lindernia crustacea* (Linn.) F.V. Muell.**



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**Morphological Description:** A small, erect or diffuse, annual herb. Stems angular. Leaves opposite. Flowers purplish or white

Fl. & Fr.: July-December.

**Field Notes:**

Commonly found along the margins of ponds, road side ditches and in paddy fields. In moist situations the plant grows luxuriantly during post-monsoon period.

**Uses:**

Used in poultices for boils, sores, ringworms and itches.

*f. Mazus pumilus* (Burm. f.)



**Morphological Description:**

An erect, tufted, annual herb. Leaves radical, Flowers bluish with white streaks.

Fl. & Fr.: August-January.

**Field Notes:**

Commonly found in wet or damp shady places and along the banks of rivers.

**Uses:** Infusion of plant is used as tonic.

#### **4. POLYGONACEAE**

**Plants Name:**

*a. Polygonum glabrum* Willd.



Local Name: Tota.

**Morphological Description:**

An erect, stout, glabrous, annual herb. Stems usually tinged with red. Leaves lanceolate, shining, Flowers pink,

Fl. & Fr.: November-May.

**Field Notes:** It is gregarious and abundantly growing in pure strands or intermixed with other species of Polygonum along the banks of nalas, ditches and other marshy places.

**Uses:** The infusion of leaves is used in colic pain. The tender leaves are eaten as leafy vegetable.

*b. Polygonum hydropiper* Linn.



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**Morphological Description:**

An erect or decumbent, annual herb, Leaves shortly stalked, Flowers pink.

Fl. & Fr.: May to September

**Field Notes:**

Generally on the roadside ditches and margin of the ponds, rivers, drainage and irrigational canals, often associated with other species of *Polygonum*. The plant is known for the bitter taste of its leaves.

**Uses:**

Leaves are used in amenorrhea and other uterine disorders. Roots are stimulant and bitter tonic.

**c. *Polygonum plebejum* R. Br.**



**Morphological Description:**

A prostrate, branched, glabrous herb. Leaves sessile, Flower pink.

Fl. & Fr.: August-April.

**Field Notes:**

Frequently found along low lying moist localities chiefly in association with *Alternanthera sessilis*.

**Uses:**

Dried and powdered plants are given for cure of pneumonia.

**d. *Rumex dentatus* Linn.**



Vernacular Name: H. - Khatpalak.

Local Name: Jangali Palak

**Morphological Description:**

An erect, deep-rooted, annual herb. Stems grooved. Leaves of two types radical and cauline. Flowers green, bisexual.

Fl. & Fr.: January-May.

**Field Notes:**

Abundantly found along ditches and moist shady places. The whole plant turns brown after drying.

Parts Used: Leaves and Roots.

**Uses:**

Roots are source of red dye, also used for cutaneous disorders. Leaves are eaten as vegetables. The pictures are gathered during the lookover to make paper more informative. These economically important aquatic and semi-aquatic plants are used for various purposes like, food, medicine, in pollution control, in pisciculture and several other uses.

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**Reference:**

1. Al Corn, J.B. 1995. The Scope and Aims of Ethnobotany in developing world. In R.E. Shultes & S.V. Reis (Ed.) *Ethnobotany: Evolution of Discipline*. Dioscorides Press, Portland, Oregon, 23-39.
2. Alam, A. 2014. Ethnomedicinal exploration of wetland plants of Champaran (E). *Research Journal of Agriculture and Forestry Sciences* **2(4)**: 8-10.
3. Alford, L.W. 1952. Alligator weed-a good cattle food. *Chemurg. Dig.* **2(9)**: 10-12.
4. Ambasata, S. P. 2000. *The Useful Plants of India* New Delhi: National Institute of Science Communication.
5. Anonymous 1948 – 1976. *The Wealth of India – A Dictionary of Indian raw materials and industrial Products*. New Delhi: CSIR, 11 volumes.
6. Anonymous 2002. *The Wealth of India – A Dictionary of Indian raw materials and industrial Products*. 1st sup.ser, Raw Materials. New Delhi: National Institute of Science Communication and Information Resources (CSIR), **Vol. 3 (D-I)**.
7. Anonymous 2003. *The Wealth of India – A Dictionary of Indian raw materials and industrial Products*. 1st sup.ser, Raw Materials. New Delhi: National Institute of Science Communication and Information Resources (CSIR), **Vol. 4 (J-Q)**.
8. Austin DF. 2007. Water spinach (*Ipomoea aquatica*, Convolvulaceae): a food gone wild. *Ethnobotany Research & Applications* **5**:123-146.
9. Bajpai, N. and Singh, P.K. 2009. Ethnobotanical survey of aquatic and semi-aquatic angiosperms of Chitrakoot-Dham (Division) (U.P.) *Journal of Living World* **16(2)**: 18-24.
10. Bhunia, D. & A.K. Mondal 2009. The exploration of aquatic medicinal plants of Paschim Midnapur district of West Bengal. *Ecology and Environment* **27(1)**: 64-70.
11. Bhagyaleena. P. & R. Gopalan 2012. Aquatic Medicinal Plants in Ponds of Palakkad, Kerala, India. *IOSR Journal of Pharmacy and Biological Sciences (IOSRJPBS)* **2 (3)**: 29-35., [www.iosrjournals.org](http://www.iosrjournals.org)
12. Bimal, R., B.K. Verma & R. Bimal 1991. Flora of Muzaffarpur district (India): Part-I Wall Flora. *J. Econ. Tax. Bot.* **15(2)**:261-263.
13. Bimal, R., N. Akhtar., A. Anand & A.K. Lovely 2014. Systematic enumeration of aquatic vascular plants of Muzaffarpur with special reference to B.R.A. University Campus. *Indian Journal of Advances in Plant Research* **1(16)**:14-16. [www.ijapronline.com](http://www.ijapronline.com)
14. Bimal, R., N. Akhtar., A. Anand & A.K. Lovely 2014. Systematic evaluation and conservation of aquatic vascular plants of Muzaffarpur district (Bihar), India. *Proc. Nat. Symposium on Emerging Trends in Botanical Sciences*, Department of Botany, Punjabi University, Patiala. Feb.17-18. A-55. P.74.
15. Biswas, K. & Calder, C.C. 1937. *Hand-book of Common Water and Marshy Plants of India and Burma*. Delhi: Government Press.
16. Body, C.E. 1974. Utilization of aquatic plants. In D.S. Mitchell (Ed.): *Aquatic vegetation and its uses and control*. Paris: UNESCO, 107-114.
17. Boyd, C.E. 1968. Fresh water plants: a potential source of protein. *Econ. Bot.* **22**:369-369.
18. CIFRI\_Report\_Inland Mapping.
19. Chaturvedi, A. & G. Phani Kumar (2007). Ethnobotanical observations in Pench National Park, Maharashtra, India. In A.P.



20. Chopra, R.N., S. L. Nayar & I. C. Chopra 1956. *Glossary of Indian Medicinal Plants*. New Delhi: C.S.I.R.
21. Cook, C.D.K. 1996. *Aquatic Plant Book*. Academic Publishing. The Hague, The Netherlands. pp.228.
22. Cook, C.D.K. 1996. *Aquatic and Wetland Plants of India*. London: Oxford University Press.
23. Clegg, J. 1986. *Observer's Book of Pond Life*. London: Frederick Warne and Co. Ltd. pp 460.
24. Crow, E. C. & C. B. Hellquist 2000. *Aquatic and Wetland Plants of Northeastern North America. Vol. I. Dicotyledons*. University of Wisconsin Press, Madison, Wisconsin, 48.
25. Dangwal, L.R., A. Sharma, N. Kumar, C.S. Rana & U. Sharma 2010. Ethno-medico botany of some aquatic Angiospermae from North- West Himalaya. *Researcher* **2** (4): 49-54. [science.pub.net/researcher](http://science.pub.net/researcher).