



STUDY OF AQUATIC MEDICINAL PLANTS OF HAZARIBAG DISTRICT OF JHARKHAND, INDIA

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ABSTRACT

Aquatic angiosperms are very remarkable forms of plant-life and they find a more or less precious footing in pond ecosystem. Paradoxically enough, it is not easy to define aquatic plants, at least in a manner that they may be applied without fear of contradiction; the difficulty comes from the existence of numerous species.

Muenschler (1944) considered aquatic plants as those species. Which normally stand in water and grow for at least a part of their life cycle in water⁶. Similar view has been explained by Reid (1961) who defined water plants as those seeds germinate in either the water phase or the substrate of a body of water and which must spend part of their cycle in water. This biological grouping includes plants which grow completely submerged (except when flowering) as well as variety of emergent types.

Keywords: Aquatic Angiosperm, Nutraceuticals, Ophthalmic, Unrepairable, Chotanagpur

INTRODUCTION

The earlier record use of medicinal plants for prevention of disease and use of ointment can be traced Rig-Veda perhaps the oldest repository of human knowledge have been written between 4500 & 1600 BC.

Each ethnic community has their own health care system, their ancient knowledge, sometimes referred to as ethno therapeutics. They are utilized their plant part like rhizome, stem, roots, fruits, leaves, in various ways for the treatment of various ailments since ancient time.

In spite of the impressive work done on the aquatic plants of India viz. Biswas and Calder (1955), Subramanyam⁷ (1962), Vyas⁸ (1965), Jha (1965), Kaul and Zutshi⁹ (1967), Hogeweg and Brenkert^{10,11} (1969 a, b) Kaul (1971), Ramchandran, aquatic angiosperms have not been adequately studied in Jharkhand. Some workers, like Hains (1961), Singh (1998) have made survey of angiospermic flora of Hazaribagh but their findings are mainly based on terrestrial plants. Aquatic plants are generally considered as menace as they are often result of eutrophication. But this is also a myth as a large number of aquatic plants are useful for human being and their medicinal uses are worth mentioning. Keeping these facts in mind present investigation was formulated to study aquatic plants of Hazaribag district and to document their medicinal properties prevalent among local people.

MATERIALS & METHODS

Hazaribagh, lying between 23° 25' to 24° 48' N lat and 84° 27' to 86° 34' E long and is situated at 610 meter altitude. It forms the north eastern position of the north chotanagpur division of Jharkhand state. Hazaribag having 45% forest land has got a good number of water bodies although a thorough survey of such wetlands is still to be carried out. 12.2% of total population is of tribal which possess remarkable wisdom to utilize different forms of plants for various purposes. In present study, 12 ponds of study area was taken into consideration (Table-1). The ponds were visited every month and aquatic plants were collected and their herbaria were prepared. Pahan, the wisest man among tribal, medicine men and local herbal healers were consulted for preliminary identification of plants. Botanical

identification was made with help of Heins Flora and Flora of Hazaribag, published by Botanical Survey of India. Botanical names, common names, properties, parts used and their curative uses were recorded.

RESULTS AND DISCUSSION

Result of present investigation is enumerated in Table-2. Altogether 24 hydrophytes of medicinal importance have been recorded from water bodies of Hazaribag. These plants belong to 20 families. A remarkable feature of the study outcome is restriction of number of species belonging to one family. Out of the total plants recorded 9 were found to possess diuretic properties and 6 have astringent properties. 4 plants were found to possess astringent properties whereas 2 were useful in ophthalmic ailments. *Aponnagaton natans* is a multiuse plants collected from study area and tribal use starch rich seeds in roasted form which has high nutritive value. Dried flowers of this plant are utilized to impart flavor to meal. *Eicchornia crassipes* the notorious weed of water body is a good source of antioxidant agents (Lata et.al.2010)⁵. Tribal of Hazaribag area have been using this plant as food item from time immemorial. Remarkably, local people use various aquatic plants for treatment of common diseases like, cold, fever scorpion ting, liver trouble etc. A good number of plants are used as nutraceuticals as well.

It is however a matter of concern that land use pattern in Hazaribag is changing fast and water bodies are soft target of this change. Needless to mention this is causing unrepairable harm to aquatic plant diversity both species wise and population wise. Almost same concern has been expressed by other authors as well like, Pandey and Pandey²⁰⁰⁹² and Bhunia and Mandal⁽²⁰⁰⁹⁾³. It is therefore urgently suggested by the authors to take contingency of the situation and save highly useful aquatic plants. It is also important to note that most of the traditional uses of aquatic plants are novel and they need both popularization and preservation.

Table 2
 ENUMERATION OF AQUATIC PLANTS OF MEDICINAL USES FOUND IN HAZARIBAG

SI NO	BOTANICAL NAME	LOCAL NAME	FAMILY	PROPERTIES	PARTS USED	AILMENT /USES
1	<i>Astercantha longifolia L</i>	Gokhuljanum	Acanthaceae	Astringent, diuretic, stomachic	Leaves Roots	The leaf, roots & seeds are used as diuretic & employed in jaundice, dropsy, rheumatism & diseases of urinogenital tracts. tribal people made decoction of leaves, cool them over night & administered one cup empty bowel in the morning for 7 to 10 days. Cure urinogenital disorder. Paste of roots is applied in rheumatism.
2	<i>Alternanthera sessilis L</i>	Garundi garoo ,mullabanthi	Amaranthaceae	Ophthalmic, detergent	Stem, leaves	Leaf extract is useful in various types of eyes trouble. Decoction of stem & leaf is taken half cup daily for 4 to 7 days to check blood vomiting. Poultice of leaf is applied on boils.
3	<i>Aponnegeton natans L</i>	Ghechu	Aponaetonaceae	Antidote, Antiphlogistic, Depurative ,Diuretic, Febrifuge	Leaves seed	The starchy seed is roasted & taken as food supplement in different areas of Jharkhand. The flowering spike & young shoot is used as vegetables. Tribals use flower of this plant as flavoring agent. Regular use of this plant is helpful in curing stomach disorder & reviving digestive system.
4	<i>Cerretophyllum demersum L</i>	Jhanjhi	ceratophyllaceae	cardiotonic	Leaves	Paste of leaf is externally applied in cases of scorpion. Decoction of leaf is used for 10 to 15 days to regulate biles secretion.
5	<i>Eichhornia crassipes (mart) solms</i>	Jalkhumbi	Pontideriaceae	astringent	Leaves, petiole	The plants are used as manure young leaves and petioles cooked virtually tasteless said to be used as a carotene rich table vegetable, antioxidant.
6	<i>Hydrolea zeylanica L vahl</i>	Kassachara	Hydrophyliaceae	Diuretic, febrifuge	leaves	The leaves have antiseptic properties & its Decoction is useful in healing ulcer young shoot are eaten as vegetable.
7	<i>Hydrilla verticilita (L.F) Royle</i>	Jhangi,kureli	Hydrochartaceae	Detergent miscellary	Leaves	Decoction of leaf is used in the treatment of abscesses boil and wounds. Leaves are dried powdered and applied on cuts and wounds. To help accelerate healing.
8	<i>Jussiaea repens Lnn</i>	Allamonda	Oenotheraceae	Depurative , diuretic, febrifuge	Root, leaves, fruit, seeds	Powdered of dried plant is applied on ulcer and skin diseases.
9	<i>Lemna minor Lnn</i>	Patseola, pancha	Lamnaceae	Antiscorbutic, astringent, depurative, febrifuge, diuretic, ophthalmic, sedative	Leaves	Leaves are boiled in water and used in treatment of cold. Decoction of leaf and continuously 15 days cure problem in urination. Decoction of leaf is also used for as ophthalmic wash. Application of paste of leaf is useful in skin diseases.
10	<i>Marsilea quardifolia L</i>	Panitengesi sunusunia	Marsileaceae	Antidote, antiphlogistic ,depurative, diuretic, febrifuge	Leaves, seed	Juice of leaf is administered one teaspoon for 4 times day in diarrhea. Paste of leaf is also applied on snakebite & abscesses.
11	<i>Nelumbo nucifera Gaertn</i>	kamal	Nymphaeaceae	Astringent, Cardiotonic ,febrifuge, hypotensive, tonic, vasodilator	Flowers ,leaves ,root, seed, stem	One table spoon of decoction of flower mixed with a glass of water in regularly used as cardio tonic & liver tonic. Paste of seeds is applied in cure of skin disease. Powdered rhizome is used externally to cure piles.
12	<i>Nymphoides indicum L</i>	Kumudni, panchuli	Menyanthaceae	diuretic	Leaves	One table spoon of paste of leaves is mixed in one glass of water & is used once a day in fever & jaundice.
13	<i>Nymphaea nauchali Burm</i>	Nilotpalam, upila kamal	Nymphaeaceae	Tonic	Leaves	Leaves are soaked in water overnight & one glass of this preparation is taken in the morning for 4 to 6 days in dysentery & other intestinal disorder. The decoction of leaf is also used in irregular mensuration.
14	<i>Ludwigia adsecndena L</i>	Labangi, hikota	Onagraceae	Astringent		Whole plant is boiled in water, the water after cooling is administer one cup twice a day for 4 to 6 days in fever cold & cough. Decoction of plant also used in dysentery.
15	<i>Polygonum glabrum Wild</i>	Gulabi, sauriarak, bsirjaush	Polygonaceae	Anthelmintic, astringent, cardiotonic,	Leaves, seed	Half cup decoction of whole plant is used twice daily in fever infusion of leaf relief patient from colic pain.

				diuretic, febrifuge ,purgative, vulnerary		
16	<i>Ranunculus scularatus L</i>	Jaldhinia	Ranunculaceae	Anodyne, antirheumatic antispasmodic, diaphoretic, emmenagogue	leaves	One tea spoon of dried & powdered rhizome is used in diarrhoea & dysentery. One table spoon juice of leaf is mixed in one cup of water & administered daily for 10 days to remove ringworm. Tribal of Jharkhand are of fresh plant as tonic and dieteary supplement.
17	<i>Sagittaria sagittifolia Leucopetala</i>	Muyamuya, hartog	Alismataceae	Diuretic antiscorbutic	Leaves, root	Paste of leaf is externally applied in different types of skin problems. Decoction of tuber is used by tribal as mean of birth control as it induces premature terminations.
18	<i>Spirodela polyrhiza L schleid</i>	Panivaragu	Lamnaceae	Antipyretic antipyretic, cardio tonic, carminative, diaphoretic	leaves	2 table spoon of decoction of leaf is used thrice daily for 3 days in cold & cough. Decoction is useful in regulating urination. Paste of leaf is applied externally on measels.
19	<i>Trapa bispinosa Roxb</i>	singhada	Trapaceae	Astringent, tonic, nutritive, refrigerant, stomachic	Stem ,fruits	Fruit is non endospermic edible , it is sweet tasting , its most notable nutritive component is iron ,it is used in sweets
20	<i>Ipomoea aquatica Forsk</i>	Kalmisag, ganthian	Convolvulaceae	Purgative	Leaves, shoot	Two tea spoon of young leaf juice is taken in the night as purgative. Decoction of leaf is also as blood purifier.
21	<i>Pistia stratiotes L</i>	Topapana	Araceae	Diuretic	root	One tea spoon of powdered root is taken in the night as laxative. Regular use of half cup of decoction of root is administered in eczema cold & cough. Decoction of root is also helpful in removing ring worm. Paste of root is useful in skin disease.
22	<i>Urticularia australisL</i>	Itka	Lentibulariaceae	Diuretic, vulnerary	Leaves, root	Paste of plant is applied on burns & a wound twice of plant is a good tonic & enrich in mineral content.
23	<i>Vallisneria natans L</i>	Sawala, syala, jallil	Hydrocharitaceae	Appetizer, demulcent, refrigerant, stomachic,	leaves	One cup decoction of leaf is given per day for 10 to 15 days in cases of leucorrhoea and other complains of uterus. Leaves are boiled with sesame seeds and one cup of this preparation is used as appetizer.
24	<i>Wolfia arrhiza (L) horkel ex wimm</i>	,Thali	Lamnaceae	Nutritive appetizer	leaves	Leaves are cooked and used as vegetable. The leaves highly nutritious having good taste.

Anexxure 1

Astringent: - substance is chemical compound that tends to shrink or constrict body tissue.

Anthelmintic: - acting to expel or destroy parasitic intestinal worms.

Appetizer: - is food items seined before main cause of a meal.

Antipuritic: -also known as anti- itch- drugs and are medications that inhibit the itching (Latin- pruritus)

Antipyretic: - something that reduces fever or quells it.

Antiscorbutic: - preventing or relieving scurvy.

Antidote: -is a substance which can concentrate a form of poisoning.

Antiphlogistic: -reducing inflammation of fever, anti- inflammatory.

Anodyne: -a pain reliving medicine or an opiate or narcotic.

Antirheumatic: -drugs used to treat rheumatoid arthritis. (Devastating effects on faints and general health)

Antipasmodic; - is a drug that suppresses muscle spasms.

Cardio tonic: - having a tonic effect on the health.

Carminative: - an agent that prevents or relieves flatulence gas in the gastrointestinal treat, in infants may help in the treatment colic.

Depurative: - purifying the blood or the human's depuratory.

Diaphoretic: -an agent that promotes sweating & produce perspiration.

Depurative: -ability of a substance to decontaminate or purify.

Emmenagogue: - a drug or agent that induces or hastens menstrual flow.

Febrifuge: serving to reduce fever

Hypotensive: is abnormally low B.P.

Ophthalmic: -of or relating to resembling the eye ocular muscles or part believed to be sensitive to light

Purgative: - an agent used for purging the bowels.

Refrigerant: is a compound used in a heart cycle that reversibly undergoes a phase change from a gas to liquid- fluorocarbons

Resolvent: - a medicine that reduce inflammation or swelling.

Rubefercent: - an herb or substance used to bring blood rapidly to a concentration area of the skin thus causing redness of skin.

Stomachic: - an agent such as medicine that strengthens or stimulates stomach.

Sedative: -a drug that calms a patient down, due to agitation and permitting sleep.

Tonic: - a usually liquid drug that elevates the rate of urination & then provides a means of forced diuresis. It is used treat heart failure, liver cirrhosis, hypertension and certain kidney diseases.

Vasodilator: - directly affect the relationship between arterial pressure, cardiac output & total peripheral resistance (TPR). Drugs that act as blood vessel dilator & open vessels by relaxing their muscular walls.

Vulnerary: - a remedy used in healing or treating wounds.

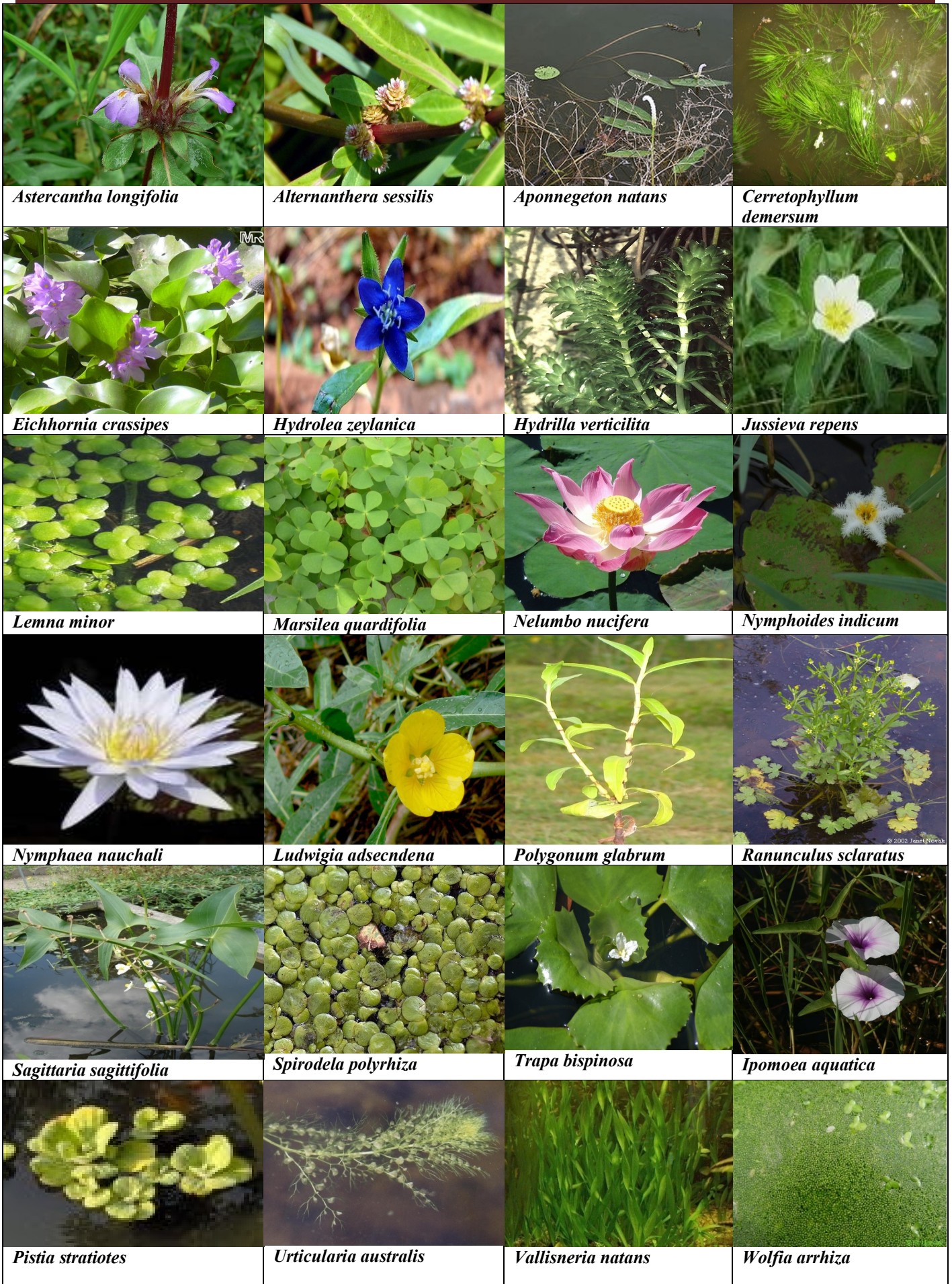


Table 1:- List of ponds of Hazarihag studied

Bhudhwa mahadev Talab	Babua Talab
Dhobia talab	Harli talab
Hazaribag jheel	Subhash talab
Khirgaon talab	Okani talab
Mithwa talab	Jhinharia talab
Khanjchi talab	Chat talab

REFERENCES

- 1 Alka Jain, R Roshanibala, PB Kanjilal, RS Singh, HB Singh. Aquatic plants used in herbal remedies in the wetlands of Manipur, Northeast India. *Indian Journal of Traditional Knowledge*, Vol 6(2) 2007 pp.346-351.
2. Pandey RK and Chetna Pandey, Medicinal value of aquatic wetland plants of Varanasi., *Indian journal of tropical biodiversity*, 2009 Vol-17 no-2 pp 141-150.
3. Debasis Bhunia, Mondal, A. K. The exploration of aquatic medicinal plants of Paschim Midnapur district of west Bengal. 2009 vol. 27 no 1 pp.64-70 *Ecology and environment*
4. JU and Sunderbarathy TV, Utilization of aquatic plants- a method to enhance the productivity of water in seasonal tanks of Anuradhapuram District. Munasinghe www.iwmi.cgiar.org
5. N Lata, Sumana Das and Veenapani Dubey., Antioxidants of *Eichhornia crissipes*- worlds most worst aquatic weed. *Journal of pharmacy research*, 2010 vol.3 no.9 pp.2105-2196.
6. Muenscher, W.C.. Aquatic plants of the United States. Comstock Publishing Company, Inc. Ithaca, New York. 1944, 374 p.
7. Subramanyam, K.. Aquatic Angiosperms. Botanical Monograph No. 1962, 3: 92. t. 54. CSIR. India.
8. Vyas, L.H.. Studies on the grassland communities of Alwar. *Jour. India Bot. Soc.* 1965, 43:490-494.
9. Kaul, V. & D. P. Zutshi.. A study of aquatic and marshland vegetation in Srinagar. *Proc. Nat. Inst. Sci. India.* 1967, 33: 111-127.
10. Hogeweg, P. and A.L. Brenkert, Affinities between growth forms in aquatic vegetation. *Tropical Ecology* 1969, pp. 182-194.
11. Hogeweg, P. and A.L. Brenkert, Structure of aquatic vegetation: a comparison of aquatic vegetation in India, the Netherlands and Czechoslovakia. *Tropical Ecology* 1969, 10, 139-162.
12. Pandey, J. and U. Pandey. Microbial processes at land – water interface and cross – domain causal relationships as influenced by atmospheric deposition of pollutants in three freshwater lakes in India. *Lakes and Reservoirs: Research and Management*, 2009, 14 (1): 71 – 84.

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