

Studies on some medicinally important wetland angiosperms used by the Bodo tribe of Kamrup District in Assam, India

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Abstract

People of Bodo tribe living in Kamrup district of Assam, India, use 25 angiospermic (16 Dicots and 9 Monocots) weeds against various diseases they suffer. Many of these plants are also useful in many other ways. The habits, habitats, phenology etc of these plants also has been recorded.

Keywords: Aquatic angiosperms, Weeds; Bodo tribe; Ethno medicine; Kamrup District.

INTRODUCTION

Aquatic weeds are understood especially as those plants, which mainly grow in various types of water bodies e.g. swamps, beels, rivers, ditches, jheels, paddy fields and other water-logged areas i.e. wetlands. Besides flowering plants, non-flowering plants like many species of ferns, algae, bryophytes etc. are also available in wetlands. Because of creating unwanted circumstances, normally aquatic plants are regarded as disturbing and harmful agents and that is why these are also referred as aquatic weeds. The dense growth of these plants obstructs water flow in irrigation channels and interferes with navigation and hydroelectric power generation.

Aquatic-weed flora in Kamrup District of Assam is quite rich but our knowledge regarding their taxonomy, ecology, ethnobotany etc. is inadequate. Recent investigations (Pathak 1990; Barua 1992) have shown that many aquatic weeds can be exploited for human welfare in various ways. Keeping this point in view, a thorough study has been undertaken on the diversity of aquatic weeds of Kamrup District, Assam used by the Bodo tribe having medicinal and other economic values.

Kamrup is a District of western Assam and is located between 25°46'N and 26° 49' N latitude and between 90° 48' and 91° 50' East longitude. It covers an area of 4,345 sq km. It is bounded by Udalguri and Baska Districts in the north, Darrang and Morigoan districts in the east, Nalbari, Barpeeta and Goalpara districts in the west and the State of Meghalaya in the south. Important rivers of Kamrup District are: Brahmaputra and its tributaries Puthimari, Borno, Nona, Kulsi, Pagladiya and Kalajal. As per Census Report (2001) the total population of Kamrup district is 2000071 (<http://kamrup.nic.in/glancefr.htm>) of them 19,844 are belonging to Bodo tribe, which accounts for 45.52% of the total tribal population of Assam.

MATERIALS AND METHODS

A thorough study on the aquatic angiosperms of the Kamrup district, Assam was carried out during 2005 – 2007. During the survey period, information was collected from traditional practitioners and other old and experienced people of the Bodo community living in different parts of the district following the method of Jain (1987). Plant samples were collected and processed into the mounted Herbarium sheets following the methods of Jain & Rao (1977). The mounted specimens were

identified using different floras (Hooker 1872-1897; Kanjilal *et al* 1934-1940; Bor 1940; Deb 1981-1983; Joseph 1982 and Balakrishnan 1981,1983), and were matched at ASSAM Herbarium and in the Herbarium of the Botany Department, Gauhati University. Correct nomenclature of identified plants was determined through the consultation of recent literature.

The present paper has thrown light on 25 species of medicinally important aquatic angiosperms covering 22 genera belonging to 19 families.

In the enumeration, the scientific names of the plants are arranged in alphabetic order followed by protologue reference and their respective families (given in parenthesis), vernacular names in Assamese (As) and in Bodo (Bd), a brief taxonomic description, occurrence, flowering and fruiting periods and ethnomedicinal uses along with useful plant-parts. Different plant parts used by the Bodo tribe are abbreviated as follows: **Bb**: bulb; **fl**: flower; **fr**: fruit; **lf**: leaf; **infl**: inflorescence; **la**: latex; **nt**: nut; **rh**: rhizome, **rt**: root; **sd**: seed; **sh**: shoot; **st**: stem; **tu**: tuber; **wp**: whole plant.

ENUMERATION

Alternanthera philoxeroides (Martius) Grisebach, Goett. Abh. 25:36. 1879; Barua *et* Chowdhury, J. Univ. Gauhati, 20 – 22, 98, t. 1, 1974. [**Amaranthaceae**].

Local names: *Panimatikaduri*, *Nol duba* (As); *Doigaldeb* (Bd).

Annual floating decumbent herb or creeping and rooting at base; leaves opposite, elliptic-lanceolate; flowers white in long-pedunculate heads.

Occurrence: Common in shallow marshy places. **Flowers & Fruits:** June – August

Ethnomedicinal uses: Stomach pain, Asthma (sh).

Commelina benghalensis L., Sp. Pl. 41.1753. [**Commelinaceae**]

Local names: *Kona Himolu* (As); *Khana-simlai* (Bd).

Diffuse herb with creeping stem, rooting at lower nodes; lamina ovate; flowers blue.

Occurrence: Common in shallow marshy places. **Flowers & Fruits:** July – November

Ethnomedicinal uses: Diarrhoea, snake bite, wounds (lf); fever, liver complaints (rt).

Cyperus rotundus L., Sp. Pl. 45. 1753; [**Cyperaceae**]

Local names: *Mutha bon*, *Keya bon* (As); *Mutha* (Bd).

Perennial with creeping rhizome; spikelets 3 – 10 together; nuts less than half of glumes.

Occurrence: Abundant in moist open grasslands and marshy places. **Flowers & Fruits:** May – September

Ethnomedicinal uses: Bowel complaints, snake bite (rt); dysentery, sores, wounds, and jaundice (rh).

Eichhornia crassipes (Martius) Solms-Laub., DC. Mon. Phaner 4: 527. 1883: [**Pontederiaceae**]

Local names: *Meteka* (As); *Methoka* (Bd).

Free- floating herb, roots numerous pendulous; petioles spongy and swollen; flowers lilac with a yellow blotch.

Occurrence: Gregarious weed in beels, ponds etc. **Flowers & Fruits:** Generally in summer.

Ethnomedicinal uses: Ear complaint (lf); body swelling (lf petiole); skin diseases of cattle (fl).

Enydra fluctuans Loureiro, Fl. Cochinch. 511. 1790; Kanjilal *et al.*, FA. 3: 126. 1939. [**Asteraceae**]

Local names: *Helechi* (As); *Alachi Maigong* (Bd).

Perennial succulent prostrate herb, branches floating; leaves opposite; heads sessile; rays white.

Occurrence: Common in marshes and shallow water. **Flowers & Fruits:** March – May.

Ethnomedicinal uses: High blood pressure, snake bite (sh); dropsy, improvement of eye sight and reduction of bad effects of intestinal worm (lf).

Euryale ferox W. Salisbury, Koen. & Sims., Ann. Bot. 2:73. 1806; Kanjilal *et al.*, FA 1: 65. 1934.

[**Euryalaceae**]

Local names: *Nikhori* (As); *Makhna* (Bd).

Perennial rooted-floating densely prickly rhizomatous herb; lamina peltate-orbicular; flowers solitary.

Occurrence: A common fresh water plant. **Flowers & Fruits:** August – November

Ethnomedicinal uses: Skin diseases (sd).

Ipomoea aquatica Forskål, Fl. Aeg-Arab 44. 1775; Kanjilal *et al.* FA. 3: 348. 1939.

[**Convolvulaceae**]

Local names: *Kolmoui sak* (As); *Mande Maigong* (Bd)

Branches floating; perennating with root stock ; lamina hastate; flowers pinkish white.

Occurrence: Abundant in marshes and moist places. **Flowers & Fruits:** October – December

Ethnomedicinal uses: Boils (st); eye diseases (fr., fl); liver trouble (wp); stomach pain and labor pain (lf).

Ipomoea carnea Jacquin ssp. *fistulosa* (Choisy) D. Austin in Taxon 26 : 237. 1977.

[**Convolvulaceae**]

Local names: *Pani- votora*, *Amarlota* (As); *Kholom* (Bd).

A shrub; stem fistular; sap milky; lamina ovate-oblong, cordate; flowers violet.

Occurrence: Aggressive weed of marshy places and roadsides. **Flowers & Fruits:** Almost throughout the year.

Ethnomedicinal uses: Skin diseases of cattle (la).

Lasia spinosa (L.) Thwaites, Enum. Fl. Zeyl. 336. 1864. [**Araceae**]

Local names: *Cheng -mara* (As); *Sibru* (Bd).

Stout rhizomatous much prickly perennial herb; leaves in apical rosette; lamina sagittate-pinnatifid; spathe twisted; berries with warty tips.

Occurrence: Common in shallow marshy places. **Flowers & Fruits:** January – August

Ethnomedicinal uses: Cuts, intestinal worms (lf); diarrhea, dysentery, asthma, bronchitis (rh).

Ludwigia adscendens (L.) Hara, J. Jap. Bot. 28:290. 1953. [**Onagraceae**]

Local names: *Sapply* (As); *Thaljuria* (Bd).

Annual; conspicuous erect white-spongy floating roots on floating stems; flowers white.

Occurrence: Common in stagnant water and marshes. **Flower:** January – March; **Fruit:** February – December

Ethnomedicinal uses: Diarrhea and dysentery (lf)

Ludwigia octovalvis (Jacquin) Raven in Kew. Bull. 15: 476.1962. [**Onagraceae**]

Local names: *Long bon* (As); *Hagrani longa* (Bd).

Suffruticose erect herbs; lamina linear, lanceolate; flowers yellow; seeds multiseriate in locules.

Occurrence: Common weed of lowlands, ditches etc. **Flowers & Fruits:** Almost throughout the year.

Ethnomedicinal uses: Fever, thirst (lf); eczema, skin disease, wound of toe and feet (wp).

Monochoria hastata (L.) Solms-Laub. in DC. Mon. Phaner 4: 523 1883. [**Pontederiaceae**]

Local names: *Pani kochu*, *Jathipatia*, *Bothapatia* (As); *Ajnai* (Bd).

Perennial herbs; rhizome long; lamina hastate; flowers subumbellate; tepals bright blue.

Occurrence: Weed of lowland rice fields. **Flower:** March – September; **Fruit:** October – December

Ethnomedicinal uses: Reduction of saliva secretion in children and rheumatic pain (lf).

Murdania nudiflora L., Brenan in Kew Bull. 1952:189. 1952. [**Commelinaceae**]

Local name: *Gorji Maigong* (Bd).

Annual herbs stem creeping and rooting; lamina lanceolate; flowers 1 - 3 in raceme.

Occurrence: Common in marshy places. **Flowers & Fruits:** June – January

Ethnomedicinal uses: Stomach complaints, as tonic (rt); leprosy (wp).

Nelumbo nucifera Gaertner, Fruct. 1:73.t.19.f. 2.1789. *Nelumbium speciosum* Willd., Sp. Pl. ed. 4,2(2):1799; Kanjilal *et al*, FA 1:65. 1934. [**Nelumbonaceae**]

Local names: *Kamol*, *Podum* (As); *Thoblo Gidir*, *Padda bihar* (Bd).

Perennial herb; rhizome narrow elongated; lamina peltate-orbicular; achenes embedded in spongy thalamus.

Occurrence: Common in ponds, beels, etc; also cultivated as ornamental. **Flower & Fruit:** July – October

Ethnomedicinal uses: Cardiac tonic, curing liver and skin diseases (fl).

Nymphaea nouchali Burm.f., Fl. Ind. 120.1768. *N. lotus* Auct. non. L. Hook. f. FBI. 1:114. 1872; Kanjilal *et al*, FA.1:64.1934. [**Nymphaeaceae**]

Local names: *Nil Vet* (As); *Thoblo*, *Phet* (Bd).

Glabrous perennial rhizomatous herb; leaves long-petioled, entire or obtusely sinuate-toothed; flowers bluish; berry spongy.

Occurrence: Common in shallow water marshes. **Flowers & Fruits:** July – October

Ethnomedicinal uses: Antifertile (lf).

Nymphaea rubra Roxburgh *ex* Andrews, Bot. Rep. 8(104): t, 503.1808. [**Nymphaeaceae**]

Local names: *Ranga padma* (As); *Thoblo-bibar* (Bd).

Large perennial herb; root stalk rhizomatous; lamina sharply sinuate-toothed; flowers red or rose; seeds buried in pulp.

Occurrence: Common in ditches, ponds etc.; also grown as an ornamental plant. **Flowers & Fruits:** June – November

Ethnomedicinal uses: Dyspepsia, diarrhea and piles (rt); palpitation of heart (fl).

Nymphoides cristata (Roxburgh) O. Kuntze, Rev. Gen. Pl. 429. 1891. [**Menyanthaceae**]

Local name: *Jetuka-khar* (As).

Perennial, anchored herb with short, erect rhizome; leaves floating, glabrous, orbicular; flowers white, in dense clusters at nodes.

Occurrence: Common in ponds and ditches. **Flower & Fruit:** March – September

Ethnomedicinal uses: Foetus development (lf); gastric (tu).

Ottelia alismoides (L.)Persoon, Syn. Pl. 1:400.1805. [**Hydrocharitaceae**]

Local names: *Pani kolai*, *Segun tepa* (As);

Rooted submerged herb; heterophyllous, lamina large, broad ovate, undulate; flowers solitary, white, spathe tubular; fruits crowned with persistent perianth.

Occurrence: A weed of marshes and paddy fields. **Flower & Fruit:** August – February

Ethnomedicinal uses: Diuretic (fl, sd).

Persicaria hydropiper (L.) Spach, Hist. Nat. Veg. X: 536. 1841. *Polygonum hydropiper* L., Sp. Pl. 362. 1753; Kanjilal, *et al*, FA 4:21. 1940. [**Polygonaceae**]

Local names: *Behu*, *Bihlongoni* (As); *Bislangi*, *Saldabkhumoi* (Bd).

Annual, erect branched, softly pubescent herb; lamina sub-sessile, linear–lanceolate, gland dotted; flowers pink in lax, slender terminal racemes.

Occurrence: Abundant in drainage ditches and stagnant water of marshes. **Flower & Fruit:** Almost round the year, mostly in winter.

Ethnomedicinal uses: Ring worm (lf & infl); skin diseases (lf).

Pistia stratiotes L., Sp.Pl. 963.1753. [**Araceae**]

Local names: *Bor-puni* (As); *Phuni khar* (Bd).

Stoloniferous free floating herb; leaves in rosette, sessile, spatulate; flowers white, sessile, connate beneath the apex of spadix.

Occurrence: Gregarious in ponds and ditches. **Flowers & Fruits:** July – November

Ethnomedicinal Uses: Piles, skin disease (lf); dysuria (wp).

Ranunculus aquatilis L., Sp. Pl. 556. 1753. [**Ranunculaceae**]

Local names: *Kauri- thengia* (As); *Hagranidundia* (Bd).

Perennial, branched, rooted submerged herbs; stem hollow, horizontal; leaves palmately divided, base sheathing; flowers white, petals persistent; nutlets wrinkled.

Occurrence: Floating weed in rice fields and shallow water. **Flowers & Fruits:** January–March

Ethnomedicinal uses: Tonsil, eczema (lf); boils, piles, asthma, rheumatism, skin blisters (wp); anthelmintic (sh).

Rumex maritimus L., Sp. Pl. 335. 1753. [**Polygonaceae**]

Local names: *Bon paleng* (As); *Maitha Sikhla*, *Moisungkha* (Bd).

Rosette annual herbs; leaves mostly radical, linear-lanceolate; flowers in paniced racemes, bisexual; tepals 6, greenish white.

Occurrence: Abundant in moist places. **Flowers & Fruits:** April – October

Ethnomedicinal uses: Boils and body swelling (lf).

Sagittaria guayanensis H.B. K. *ssp. lappula* (D. Don) Bogin, Mem. N. Y. Bot. Gard. 9: 192.f.5. 1955. [**Alismataceae**]

Local names: *Jathipotia* (As); *Samboitha*(Bd)

Laticiferous rhizomatous annual; leaves erect aerial, ovate, cordate; flowers white, in few closed whorls, lower bisexual, upper male.

Occurrence: Common in marshy areas. **Flowers & Fruits:** July – October

Ethnomedicinal uses: Gastric complaints, body-ache (tu); lachia (wp).

Trapa natans L. var. *bispinosa* (Roxburgh) Makine in Linuma, Somoku-Dzusetzii ed. 3. 1:137. 1907; *T. bispinosa* Roxb., Carom. Pl. 234. 1815; Kanjilal, *et al*, FA. 2:319. 1938. [**Trapaceae**]

Local names: *Singori* (As); *Singrid*, *Singra-kaita* (Bd).

Floating and partly submerged stoloniferous herb; lamina floating rhomboid; flowers white; fruit with a short beak and 2 lateral spines; cotyledons unequal, starchy.

Occurrence: Common floating herb in ponds. **Flowers & Fruits:** Monsoon and cold seasons.

Ethnomedicinal uses: Diarrhea, bilious affection (nt); bronchial cough (lf); dropsy (fr).

Utricularia aurea Loureiro, Fl. Cochinch. 26. 1790. [**Lentibulariaceae**]

Local name: *Patal-khar* (As).

Free-floating rootless submerged insectivorous herb with numerous bladders; flowers yellow; seeds with short angles and slightly winged margins.

Occurrence: Common in ponds and marshy places. **Flowers & Fruits:** July – October

Ethnomedicinal uses: Prevention of diseases caused by mosquito (wp).

DISCUSSION AND CONCLUSION

It has been observed that the people of Bodo community inhabiting in different villages of Kamrup district of Assam are using a total of 25 species of aquatic angiospermous weeds for the treatment of some of their diseases through the generations. These are belonging to 22 genera and include 16 dicotyledonous and 9 monocotyledonous plants.

Different parts of these 25 species are found to be used by the tribe as effective medicines against several common ailments. As recorded here, the used plant parts and number of plant species are as follows: *Whole plant*-08, *Roots*-04, *Tubers*-03, *Rhizome*-02, *Shoots*-03, *Stem*-01, *Latex*-01, *Leaves*-15, *Petiole*-02, *Inflorescence*-01, *Flowers*-03, *Fruits*-02, and *Seeds* 02.

Besides having medicinal values many of these plants also possess some other beneficial properties. Some of these removes unwanted contaminants from water e.g. *Eichhornia crassipes* reduces nitrogen, phosphorous and some heavy metals from polluted and sometimes used as water purifier.

Again, some aquatic angiosperms like *Eichhornia crassipes*, *Ludwigia adscendens*, *Ludwigia octovalvis*, *Cyperus rotundus* etc. are found to be used by this tribe as fodder to meet the crisis observed in recent years.

Some of these weeds are used Bodo people of Kamrup district, Assam as vegetables, raw fruits, salad etc. like *Alternanthera philoxeroides* (sh/veg), *Commelina benghalensis* (lf/veg), *Cyperus rotundus* (tu/veg), *Enydra fluctuans* (sh/veg), *Euryale ferox* (fr, sd/veg), *Ipomoea aquatica* (sh/veg), *Lasia spinosa* (tender lf/vg), *Ludwigia adscendens* (tender sh/veg), *Monochoria hastata* (sh, infl/veg), *Nymphaea nouchali* (tu, rh, fr/salad), *N. rubra* (lf petiole, tu/veg, raw), *Ottelia alismoides* (sd/raw), *Rumex maritimus* (lf/veg), *Sagittaria guayanensis* (tu/veg), *Trapa natans* . var. *bispinosa* (fr/raw). This tribe believes the vegetables and fruits to have high nutritional value. Also, they use the dried stem of *Ipomoea carnea* as fire wood, shoots and inflorescence of *Polygonum hydropiper* for fish poisoning and consider *Utricularia aurea* as good manure for paddy fields.

Though the medicinal uses of few of these weeds against various ailments have already been reported by Kirtikar and Basu (1935) and Jain (1991), still it is expected that the present paper may add some new ethnomedicinal information which have not been recorded earlier. Cultivation of some of these species by the local people need to be encouraged to prevent their extinction and also to maintain the natural vegetation and beauty of different localities of the district. At the same time proper and effective social awareness need to be generated for *in-situ* and *ex-situ* conservation of some of these weeds to save their population from extinction.

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