

Study of Some Aquatic Species of the Family Cyperaceae and Poaceae with Special Reference to their Utilization in Dhubri District, Assam, India

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Abstract

The papers reports useful aquatic plants of the family Cyperaceae and Poaceae in Dhubri district of Assam, India. The survey was conducted during 2012-2014 and data regarding their uses were collected through interview with peoples of various communities of the area. The study revealed the occurrence of 24 species of useful aquatic plants belonging to 11 species of cyperaceae and 13 species of poaceae are used by the local inhabitants for fodder medicine, small scale industries, fish feed and fish breeding, marriage ceremonies and other religious functions.

Keywords: Dhubri, Wetlands, Cyperaceae, Poaceae, Utilization

I. INTRODUCTION

Men's dependency on aquatic plants or wetland flora has been stated since the time immemorial. In many parts in India, local inhabitants traditionally use wetland plants in their day to day life for food, fodder and medicine against the diseases they suffer from or for making different types of household products or for art works for sustenance. A significant number of wetland floras can be considered as bio-resources. There are major and minor plant resources harvested from the wetlands of rural India. All these have significant socio-economic value.

Dhubri district is the gateway of western Assam. It is lies between 25°28' to 26°22'N latitude and 89°42' to 90°12'E longitude in the flood plains of river Brahmaputra and covers a geographical area of 2,838 sq. km. The district is surrounded by Kokrajhar district in the north, on the east by Bongaigaon and Goalpara district and on the south by Garo Hill district of Meghalaya. To the west the plains merge with Bangladesh and Indian state West Bengal. Dhubri district contains about 233 small and large natural wetlands, e.g. Beel's, Haors, Ox-bow lakes, Cut off meanders, Swampy and marshy areas, Reservoirs etc. and occupying a total area of 6,459.7 hac.

II. MATERIALS AND METHODS

Field study conducted during August 2012 to July 2014, the wetlands were visited very frequently. Herbarium materials were prepared by following standard herbarium procedure (Jain & Rao, 1976) and are identified in consultation with published literatures e.g. Hooker (1872-1897), Kanjilal *et al* (1934-1940), Biswas and Calder (1937), Fassett (1940), Bor (1940, 1960), Balakrishnan (1981, 1983), Deb (1981,1983) and Cook (1996). Finally species identity was confirmed after verification with authentic herbarium materials deposited at ASSAM herbarium, Botanical Survey of India, Eastern Regional Centre, Shillong, Meghalaya. To find out the aquatic plant resources used by the rural people of the district, sufficient numbers of peoples from different communities were interviewed. Questionnaires having the information regarding the various uses for aquatic plants were collected. Even people collecting the resources at the study sites were also interviewed.

III. ENUMERATION

A. Family: Cyperaceae:

1) *Actinoscirpus grossus* (L.f.) Goetgh. & D.A.Simpson:

– Vern.Name: Monde and Kejai

Plant stoloniferous. Culms scattered, smooth, clothed at base with 1 or 2 spongy. Leaves basal; sheaths spongy; leaf blade margin scabrous. Inflorescence a terminal compound anthela, with over 10 rays and many spikelets. Spikelets solitary, rust-colored to

dark brown, sessile or pedunculate. Glumes elliptic to broadly ovate. Stamens 3; anthers linear; connective apex black, deltoid, very short. Style long; stigmas 3. Nutlet pale brownish yellow.



Fig. 1: Handicraft made by *A.grossus* & *Eichhornia crassipes*

- Fl. & Frt .: July - October.
- Part used: Stem
- Uses: Dry stem is used in binding objects and mat making.

2) *Bulbostylis barbata* (Rottb.) Clarke in Hook .f:

Annual, Highly tufted .Stem very slender, sulcate , smooth , glabrous Leaves capillary to very slender, acute at apex , glabrous or scabrous; ligule absent ; leaves at times reduced to sheaths. Inflorescence a terminal head of 2 sessile spikelets. Spikelets ovoid to ovoid – lanceolate, subacute at apex, angular,

- Fl & Frt: March-August.
- Uses: Used as cattle feed.



Fig. 2: Handicraft made by *A.grossus* & *Eichhornia crassipes*

3) *Carex rubrobrunnea* C.B.Clarke:

Rhizome short. Culms tufted, 20-50 cm tall. Leaves longer than culm, blades linear, Female glumes castaneous, 3-4mm, lanceolate, Utricles brown to olivaceous, slightly shorter than glume, oblong or oblong-lanceolate, plano-convex, densely minutely papillose. Nutlets tightly enveloped.

- Fl. & Frt .: July -August.
- Uses: Used as forage for live stock

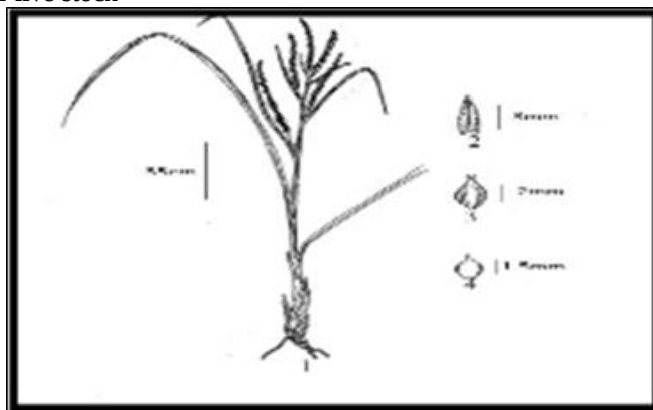


Fig. 3: *Carex rubrobrunnea* C.B.Clarke

4) *Cyperus difformis* L.

- Vern. Name: Choto moronga.

Erect annuals tufted herb with reddish, fibrous roots. Stem triquetrous, Leaves shorter or longer than stem. Inflorescence simple or compound. Spikes dense, globose, Spikelets stellately arranged, compressed. Glumes very small, membranous, Stamens 2; filaments; anthers very small. Style short, stigmas 3, slightly longer than style. Nut triquetrous.

- Fl. & Frt.: Throughout the year.
- Uses: Used as fodder.

5) *Cyperus digitatus* Roxb.

Tall perennial with short, woody rhizome. Stem tufted or solitary, trigonous, smooth. Leaves nearly as long as culm. Inflorescence compound; spikes 3-9, digitately arranged. Spikelets spicately arranged, ultimately at right angle to the rachis. Glumes membranous, elliptic, acute and apiculate at apex, keeled. Stamens 3; anthers linear. Nut trigonous, ellipsoid to oblong – obovoid.

- Fl.- Frt.: July-January.
- Use: Used as fodder.

6) *Cyperus rotundus* L.

- Vern.name: Muthaghas

Perennial. Stolon slender, with ellipsoidal tuber. Culm solitary, 10-70 cm tall. Leaves equaling or shorter than culm; sheath brown; leaf blade bluish green, flat. Involucral bracts 2 or 3. Inflorescence a simple or compound anthela. Spikes obdeltoid, with 3-10 slightly laxly arranged spikelets. Spikelets obliquely spreading, linear, Stamens 3; anthers linear. Nutlet obovoid-oblong, 3-sided, punctulate.

- Fl. & Frt.: May-November.

7) *Eleocharis congesta* D. Don

Annual shrub, tufted stem. Stem slender, sulcate, 5-30 cm long, 0.5 -1 mm thick. Sheaths membranous. Spikelets obovoid to oblong, acute at apex, many flowered. Glumes membranous, oblong – ovate, Obtuse at apex. Perianth bristles 6. Stamens 2; filaments elongate while fruiting; anthers oblong. Stigma 3. Nut trigonous, obovoid.

- Fl.& Frt.: May-August.
- Uses: Used as cattle feed.

8) *Eleocharis dulcis* (Burm.f.) Trin. ex Hensch.

- Vern. name: Pani ghas.

Perennial with woody rhizome, usually with brownish roots; stem terete, acute at apex, sheaths 7-20 cm long, light purplish brown towards base. Spikelets cylindrical, Obtuse- acute at apex, as broad or slightly broader than stem. Stamens 3; filaments elongate; anthers often purplish – brown spotted connective appendage very prominent, acuminate. Stigmas 3. Nut prominently convex.

- Fl & Frt.: May-October.

9) *Fimbristylis bisumbellata* (forssk.) Bub.

- Vern name: Marmar

Annual herbs with fibrous roots. Stem tufted, slender, triangular, striate, glabrous. Leaves shorter than stem, linear, flat. Inflorescence usually a decompound corymb of numerous loose spikelets. Involucral bracts up to 5. spikelets solitary, ovoid, ellipsoid or oblong, angled due to the strongly keeled glumes, acute at apex, many flowered. Stamen 1, anther oblong. Nut biconvex, obovate.

- Fl. & Frt.: July-September.
- Part used: Rhizome.
- Uses: Used in diseases of kidney and spleen.

10) *Fimbristylis dichotoma* (L.) Vahl.

Annual tufted herb with short woody rhizome. 15-50 cm high. Stems slender to stout, glabrous, angular. Leaves mostly from the base, flat, linear, acute to obtuse at apex. Sheaths 0.5-15 cm long, inflorescence simple to decompound corymbose of few to many spikelets. Involucral bracts 2-3. Spikelets ovoid to ellipsoid, terete, acute at apex, densely many flowered. Stamens 2, filamentous; anthers oblong-lanceolate, apiculate at apex. Stigmas 2, tapering towards apex. Nuts elliptic.

- Fl. & Frt.: July-October.
- Part used: Stem
- Use: For making of Mat

11) *Fimbristylis ferruginea* (L.) Vahl

Stem tufted, to 70 cm, rigid. Leaves flat or folded, scabrid, apex acuminate; Inflorescence simple or subcompound, to 3 cm; involucral bracts shorter than inflorescence, to 1 cm. Spikelet solitary, ovoid or oblong, pinkish-brown. Stamens 3; filaments to 2.5 mm; anthers linear. Stigmas papillose. Nut obovoid, biconvex, glossy, smooth, umbonulate, stipulate.



Fig. 4: A man collecting *Arundo donax*

- Fl. & Frt.: May-January.
- Uses: Used as fodder
- Family: Poaceae

12) *Arundo donax* L.

- Vern. name: Nol

Robust, thick rhizome. Culms very stout, erect, 2–6 m tall, unbranched or with bamboo like clusters of slender branches from nodes; leaf blades 30–50 × 2–5 cm, margins scabrous, tapering to a slender filiform apex. Spikelets 10–15 mm, florets 2–5; glumes narrowly lanceolate, lower glume acute, upper glume sharply acuminate.



Fig. 5: Making flutes from *A. donax*

- Fl. & Frt. : October–January.
- Uses: Making flute

13) *Axonopus compressus*(Sw.) P. Beauv.

- Vern. name: Doilcha bon.

Perennial with vigorous creeping stolons. Culms 15–60 cm tall, nodes bearded. Leaf sheaths loose, strongly compressed, keeled, basal sheaths imbricate; leaf blades broadly linear to lanceolate. Spikelets oblong - lanceolate, pilose or glabrous, apex acute; upper glume and lower lemma 2–4-veined, midvein absent, laterals marginal; upper lemma oblong-elliptic, shorter than spikelet, obtuse with an apical tuft of hairs; stigmas white.

- Fl. & Frt. : September–March.

14) *Brachiaria mutica* (Forssk.) Stapf

Tall perennial. Culms 50–150 cm high, tufted, erect; nodes densely bearded. Leaves linear – lanceolate, acuminate, rounded or shallowly cordate at base. Ligules membraneous, thin. Racemes pseudopaniculate, 10–20 in number. Rhachis flat, ribbon – like. Spikelets elliptic, crowded, arranged in 2 rows. Lower floret male. Upper floret bisexual. Stamens 3; anthers 1–1.5 mm. Second lemma ovate, round at apex. Palea ovate, or ovate-elliptic. Stamens similar to those of the lower floret

- Fl & Frt.: April–August.
- Uses: Used for livestock.

15) *Cynodon dactylon* (L.) Pers.

- Vern. name: Dubla-ghas.

Perennial, stoloniferous, also with slender scaly rhizomes. Culms up to 15 cm high. Leaf blades linear, short and narrow, usually glabrous, apex subacute; ligule a line of hairs. Spikes 3-6, digitate. Spikelets oblong-lanceolate or elliptic-lanceolate. Glume lanceolate. Lemma 3 nerved, Ovate-oblong or oblong when spread. Palea glabrous, keels scaberulous. Stamens 3.

- Fl. & Frt.: May-October.

16) *Echinochloa crus-galli* (L.) P. Beauv.

- Vern name: Dalghash

Annual. Culms up to 100 cm high, robust, erect, tufted; nodes glabrous. Leaf blades linear, usually glabrous, smooth, apex acute. Inflorescence erect, lanceolate to ovate or pyramidal. Spikelets ovate lanceolate ovate elliptic, acuminate or awned. Lower glume ovate. Upper glume ovate-lanceolate chartaceous. Upper lemma pale brownish at maturity, elliptic. Stamens 3. Ovary oblong.



Fig. 6: *Echinochloa crus-galli*

- Fl. & Frt.: June–November.
- Use: Mainly used as fodder and also used in diseases of spleen and in checking haemorrhage.

17) *Eleusine indica* (L.) Gaertn.

- Vern name: Bhusha.

Annuals tufted grass. Culms 10-70 cm long, compressed leaves crowded at the base, blades linear, acute 10-35 cm long, 0.25 cm broad, glabrous. Ligule small membranous. Digitate spikelets ovate or oblong green to olive green in colour 3-6 flowered glumes lanceolate acute or obtuse the lower; the upper 3-4 mm long lemma 3-4 long palea 2-keeled. Caryopsis oblong.

- Fl. & Frt.: June–April.

18) *Hymenachne assamica* (Hook.f.) Hitchc.

- Vern name.: Dol ghas.

A slender perennial grass. Culms slender, up to 45 cm tall with geniculate base. Leaves lanceolate, acuminate. Inflorescence cylindrical, interrupted, spike like, broad; branches short, appressed to the main axis. Spikelets narrowly ovate-acute, 3 mm long. Lower glume orbicular, apiculate Upper glume ovate-acute, long. Lower floret sterile; the upper hermaphrodite. Stamens 3. Stigmas plumose.

- Fl. & Frt.: May–November.

19) *Hygroryza aristata* (Retz.) Ness ex Wight & Arn.

- Vern. name: Pania ghas.

Annual aquatic free floating grass, branched, 0.5–1.5 m long. Leaf-blades ovate-oblong or ovate-lanceolate, rigid, obtuse at the apex, rounded or cordate at the base, ligule absent or membranous. Inflorescence a globose panicle. Spikelets few greenish; lemma body hispid, spinulose on veins; awned. Palea hispid, apex acute. Stamens 6.

- Fl. & Frt.: September–April.

20) *Neyraudia reynaudiana* (Kunth) Keng ex Hitchc.

- Vern. name: Pani kuishal.

Tall perennials. Culms robust, up to 100-150 cm long. Leaf blades up to 50 cm long, up to 2.5 cm broad, ligule membranous. Panicle large, often nodding; branches slender. Spikelets shortly pedicelled, up to 1 cm long, 4-8 flowered. Glumes 1-nerved; sterile, awnless, remaining ones hermaphrodite, recurved, 3-nerved, bifid, shortly awned. Palea hyaline, 2-toothed. Stamen 3. Caryopsis linear.

- Fl. & Frt.: August–March.
- Part use: Whole plant.
- Use: Used as fodder and also used for making broom.

21) *Panicum paludosum* Roxb.

- Vern.name: Borati.

Perennials. Culms erect, spongy and often with floating lower part. Leaf- blades linear or fusiform, rounded or cordate at the base; ligule a row of short hairs. Panicle contracted or spreading, 10-25 cm long. Spikelets solitary or paired. Lower glume orbicular, upper up to 3 mm long. Lower floret male or sterile. Upper floret hermaphrodite; lemma and palea coriaceous, smooth and shining.

- Fl. & Frt.: June-Nov.
- Uses: Good fodder for cattle.

22) *Panicum repens* L.

- Vern.name: Shui ghas.

Perennial. Culms 30-100 cm long, erect or trailing, rhizomatous or stoloniferous. Leaf- blades glaucous, linear- lanceolate, acuminate, rounded or slightly cordate at the base, flat or convolute; ligule a short, hairy ring. Panicle erect. Spikelets solitary or paired, lanceolate to lanceolate- oblong, acute. Lower glume orbicular, almost cup shaped. Lower floret male or sterile; the upper hermaphrodite. First lemma ovate- lanceolate. Palea oblong- lanceolate. Stamens 3. Second lemma oblong, acute, subcoriaceous. Stamens 3. Ovary ovate.

- Fl. & Frt.: August - November.
- Use: Used as fodder

23) *Pogonatherum crinitum* (Thunb.) Kunth, Enum.

- Vern.name: Sunali-gash

Perennials; culms tufted, erect, 3-6-noded, nodes bearded. Ligule short, ciliated. Inflorescence a single raceme, 1.5-3 cm long; rachis-joints ciliated, about 3/5 as long as the spikelet. Spikelets paired, dimorphic, the pedicellate spikelet smaller than the sessile one, both with 2 long awns of about 1.5-2.5 mm long. Sessile spikelets oblong, about 1.8-2 mm long; glumes papery; lower glume truncate, 2-nerved, awnless; upper glume with a longer awn, 1-nerved, as long as the lower, or slightly longer; lemma membranous; upper palea membranous, filiform, about 1-1.8 mm long; stamen 1.

- Fl. & Frt.: May-September.
- Part use: Whole plant
- Use: Used for relieving haemorrhage.

24) *Paspalum scrobiculatum* L.,

Perennial; culm tufted, 50-100 cm tall, erect, decumbent at base. Blade glabrous, more or less glaucous; sheath glabrous, longer than internode, compressed, keeled; ligule membranaceous, with tawny hairs abaxially. Racemes 2-5; rachis margins scabrous. Spikelet solitary in 2-rows, imbricate, glabrous, orbicular to ovate, 2-3 mm long; lower glume absent; upper glume membranaceous, 5 veined; lower lemma 5-7-veined, membranaceous or sometimes indurate; upper lemma dark brown at maturity, coriaceous.

- Fl. & Frt.: June-April.
- Use: Used as fodder.

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