

## Diversity of aquatic and wetland angiospermic macrophytes in the Kamrup District, Assam, India

**Karuna Kanta Das**

Department of Botany, Dakshin Kamrup College, Mirza, 781125, Assam, India  
*E-mail:* kd\_dkc@rediffmail.com

[Received revised 24.05.2013; Accepted 25.05.2013]

### Abstract

During the study of the diversity of angiospermic macrophyte flora of aquatic and wetland vegetation in Kamrup district of Assam, 128 species, belonging to 100 genera and 50 families were recorded. Besides correct botanical names, their flowering and fruiting period, local name if any are also provided in the article.

**Key words:** Angiospermic macrophyte, Kamrup district

### INTRODUCTION

Aquatic plants are those whose photosynthetically active parts remain permanently or at least for several months each year submerged in water or floating on water surface (Singh 2006). Raunkiaer (1934) described hydrophytes as plants which have vegetative parts submerged or floating on the water surface and which survive in unfavourable seasons as submerged buds attached to the parent plants or lying free on the substrate. The term wetland is rather broad. It includes a variety of habitats such as marshes, swamps, river banks, river flood plains, lakes, ponds and so on. A modified definition given by The World Conservation Union (IUCN), which is accepted by many, has been considered for defining the wetlands in this study. This definition was adopted at the first meeting of convention in Ramsar, Iran in 1971, which stated that “areas of marsh, fen, peat land or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt including areas of marine water, the depth of which at low tide does not exceed 6 meters”. Recent legislation in the U.S.A. defines a wetland as place where 80 % or more of the plants growing there are wetland plants (Cook 1996). The subject of what a wetland is and what a wetland plant is has been reviewed by Gopal (1990) for India and Tiner (1992) for the U.S.A.

Aquatic macrophytes are referred to as water plants, as well as amphiphytes and/or amphibian plants. These consist of mainly aquatic and wetland vascular plant species belonging to Pteridophytes and Angiosperms and exclude filamentous algae and grow as a natural biotic component in most shallow, still – slowly running water bodies and wetlands. In general, these represent plants which are found in around the water bodies.

Studies on aquatic and marshland plants of India are well documented by many authors including Biswas & Calder (1937), Subramanyam (1962), Chavan & Sabins (1961), Maheshwari (1960), Majumdar (1965), Mirashi (1954), Patnaik & Patnaik (1956), Unni (1967), Sen & Chatterjee (1959), Vyas (1964), Bhaskar & Razi (1973), Kachroo (1984), Lavania *et al* (1990), Bhowmik *et al* (2008), Chowdhury (2009), and Chowdhury & Das (2010, 2011).

We have very little information about aquatic and wetland macrophytes from Assam (e.g. Satyanarayana 1962; Rao & Verma 1969; Hooker 1872 – 1897; Kanjilal *et al* 1934 – 1940; Bor 1940; Malakar 1995; Pal & Dutta Choudhury 2010) on aquatics but not exhaustive. Similarly our knowledge regarding their taxonomy, ecology, ethnobotany etc of Kamrup District, Assam is inadequate where as the aquatic and wetland angiospermic macrophyte vegetation of this area is quite rich. Only a few workers have ventured to study the aquatic plants of this district (Satyanarayana 1962; Pathak 1990; Barua 1992). From this district, a few workers have published useful accounts on aquatic angiosperms (Sarkar *et al* 2008). So, the work done with respect to the present area is rather meager and needs thorough investigation. In view of this, the present study only on Kamrup District, Assam was undertaken.

### STUDY AREA

The Kamrup District, Assam lies between 25° 40' and 26° 37' North latitudes and 90° 05' and 92° 50' East longitudes. The district is bounded by Nalbari and Baksa districts in the north and Meghalaya state in the south. The eastern boundary is covered by Kamrup Metropolitan and Darang districts and western side is by Goalpara district of Assam. The study area is originally a part of undivided Kamrup district, curved out from it on 15<sup>th</sup> August, 2002 as Kamrup District with Guwahati as headquarter. The climate of the district is characterized by hot and humid in summer and dry and cold foggy winter. The year may be divided into four seasons. Late November to end of February is the winter which is followed by pre-monsoon (March to May), June to September is the monsoon and from mid-September to first part of the November is the retreating monsoon. The rainfall of this area ranges between 1500 mm to 2600 mm with an average relative humidity is about 75 %. Maximum temperature rises up to 38.5° C in the summer season while in the winter minimum temperature fall up to 7° C.

The principal river of the district is Brahmaputra which flows through it. Some tributaries such as Digaru, Kulsi come out from the hills in Meghalaya and meeting on the south bank. Tributaries like Borolia, Puthimari are flowing from Bhutan hills on the north bank of it. There are many lakes and ponds in the Kamrup district. The important beels of the district are Deepor beel (a Ramsar site), Chandubi beel, Dora beel, Kukurmara beel, Roumari beel, Satdala beel, Jalah etc. Besides this a considerable number of species also occur in ditches, stagnant water, wet places and rice fields.

### MATERIAL AND METHODS

A thorough survey on the aquatic and wetland angiospermic macrophytes of the Kamrup district, Assam was carried out for two years (2008 & 2009) during which regular excursions were made at short intervals to collect the plants of the area. During these periods of survey aquatic and wetland plants occurring in different aquatic bodies and water saturated areas of the district have been collected and photographed. Collected samples were 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; Subramanyam 1962; Pathak 1990; Barua 1992; Malakar 1995; Cook 1996 & Fassett 2000). Correct nomenclature of identified plants was determined through the consultation of recent literature (Chowdhury 2005) and websites (<http://www.theplantlist.org/>). The voucher specimens are housed in the herbarium of the Botany Department, D.K. College, Mirza, Assam.

### ENUMERATION

The recorded plants have been enumerated in Table 1 with families have been arranged according to Bentham & Hooker's (1862 - 1883) System of classification. However, genera within a family and species within a genus are arranged alphabetically. Nomenclatural citations are followed by locale names (Assamese) wherever available, voucher specimen number and with flowering-fruitlet periods.

**Table 1.** Aquatic and wetland angiospermic macrophytes recorded from the Kamrup district of Assam

Botanical names [Family]; Local Name; Exsiccatae	Flowers & Fruits
<b>DICOTYLEDONES</b>	
<i>Ranunculus sceleratus</i> Linnaeus [Ranunculaceae]; <i>Jaldhania</i> ; K.D. 05	March – June
<i>Ranunculus trichophyllus</i> Chaix [Ranunculaceae]; <i>Kauri-thengia</i> ; K.D. 137	January – March
<i>Euryle ferox</i> Salisbury [Nymphaeaceae]; <i>Nikori</i> ; K.D. 90	August – November
<i>Nymphaea pubescence</i> Willdenow [Nymphaeaceae]; <i>Bhetphul/ Moku</i> ; K.D. 33	July – November
<i>Nymphaea rubra</i> Roxburgh ex Andrews [Nymphaeaceae]; <i>Ronga bhet/ Ranga padma</i> ; K.D. 124	June – November
<i>Nelumbo nucifera</i> Gaertner [Nelumbonaceae]; <i>Padum</i> ; K.D. 100	May – September.
<i>Argemone mexicana</i> Linnaeus [Papaveraceae]; <i>Kuhum-kata</i> ; K.D.118	January – May
<i>Rorippa indica</i> (Linnaeus) Hiern [Brassicaceae]; <i>Bon-sarioh</i> ; K.D. 40	March – July
<i>Cleoserrata speciosa</i> (Rafinesque) Iltis [Cleomaceae]; <i>Bhutmula</i> ; K.D. 30	January – November
<i>Cleome viscosa</i> Linnaeus [Cleomaceae]; K.D. 39	April – September
<i>Drymaria diandra</i> Blume [Caryophyllaceae]; <i>Laijabori</i> ; K.D. 113	October – November
<i>Stellaria media</i> (Linnaeus) Villars [Caryophyllaceae]; <i>Morolia</i> ; K.D. 115	November – March
<i>Portulaca oleracea</i> Linnaeus [Portulacaceae]; <i>Malbhog-sak</i> ; K.D. 36	Almost round the year
<i>Portulaca quadrifida</i> Linnaeus [Portulacaceae]; <i>Malbhog-phul</i> ; K.D. 76	April – October
<i>Oxalis corniculata</i> Linnaeus [Oxalidaceae]; <i>Horu-tengachi</i> ; K.D. 32	Almost round the year
<i>Impatiens balsamina</i> Linnaeus [Balsaminaceae]; <i>Damdeuka</i> ; K.D. 55	July – November.
<i>Desmodium triflorum</i> (Linnaeus) DC. [Fabaceae]; <i>Kodialia</i> ; K.D. 74	August – December
<i>Senna alata</i> Linnaeus [Caesalpiniaceae]; <i>Khorpat</i> ; K.D. 95	October – January
<i>Senna sophera</i> Linnaeus [Caesalpiniaceae]; <i>Medelua</i> ; K.D. 27	May – October
<i>Senna tora</i> Linnaeus [Caesalpiniaceae]; <i>Bon-Medelua</i> ; K.D. 29	May – November
<i>Myriophyllum tuberculatum</i> Roxburgh [Haloragidaceae]; K.D. 26	Almost round the year
<i>Osbeckia nepalensis</i> Hooker f. [Melastomataceae]; <i>Bogi-phutuki</i> ; K.D. 28	April – October
<i>Ammannia baccifera</i> Linnaeus [Lythraceae]; K.D. 111	September – December
<i>Ludwigia adscendens</i> (Linnaeus) Hara [Onagraceae]; <i>Heloch/Taljurja</i> ; K.D. 45	March – December

<b>Botanical names [Family]; Local Name; Exsiccatae</b>	<b>Flowers &amp; Fruits</b>
<i>Ludwigia octovalvis</i> (Jacquin) Raven [Onagraceae]; <i>Bon-long</i> ; K.D. 52	Almost round the year
<i>Trapa natans</i> var. <i>bispinosa</i> (Roxburgh) Makino [Trapaceae]; <i>Dangor singori</i> ; K.D. 70	July – December
<i>Centella asiatica</i> (Linnaeus) Urban [Apiaceae]; <i>Bor-Mani muni</i> ; K.D. 54	Throughout the year
<i>Coriandrum sativum</i> Linnaeus [Apiaceae]; <i>Dhania</i> ; K.D. 74	October – March
<i>Hydrocotyle sibthorpioides</i> Lamarck [Apiaceae]; <i>Horu-Mani muni</i> ; K.D. 178	April – May
<i>Oenanthe javanica</i> (Blume) DC. [Apiaceae]; K.D. 72	May – September
<i>Hedyotis corymbosa</i> (Linnaeus) Lamarck [Rubiaceae]; K.D. 91	July – November
<i>Ageratum conyzoides</i> Linnaeus [Asteraceae]; <i>Gendhali-bon</i> ; K.D. 117	January – December
<i>Eclipta prostrata</i> (Linnaeus) Linnaeus [Asteraceae]; <i>Kehraj</i> ; K.D. 119	January – December
<i>Enydra fluctuans</i> Loureiro [Asteraceae]; <i>Helachi-sak</i> ; K.D. 109	April – May
<i>Gnaphalium polycaulon</i> Persoon [Asteraceae]; <i>Kopahi-bon</i> ; K.D. 125	December – May
<i>Grangea maderaspatana</i> (Linnaeus) Poiret [Asteraceae]; K.D. 50	May – November
<i>Spilanthes paniculata</i> Wallich ex DC. [Asteraceae]; <i>Suhoni</i> ; K.D. 99	April – May
<i>Xanthium strumarium</i> Linnaeus [Asteraceae]; <i>Agora</i> ; K.D. 47	July – January
<i>Sphenoclea zeylanica</i> Gaertner [Sphenocleaceae]; K.D. 107	August – December
<i>Nymphoides hydrophyllum</i> (Loureiro) O. Kuntze [Menyanthaceae]; <i>Jetuka-khar</i> ; K.D. 89	March – November
<i>Nymphoides indicum</i> (Linnaeus) O. Kuntze [Menyanthaceae]; K.D. 73	July – December
<i>Hydrolea zeylanica</i> (Linnaeus) Vahl [Hydrophyllaceae]; <i>Leheti-Bon</i> ; K.D. 112	November-March
<i>Heliotropium indicum</i> Linnaeus [Boraginaceae]; <i>Hati-huria</i> ; K.D. 97	April – August
<i>Evolvulus numularius</i> (Linnaeus) Linnaeus [Convolvulaceae]; <i>Olakha-bon</i> ; K.D. 10	Round the year
<i>Ipomoea aquatica</i> Forsskål [Convolvulaceae]; <i>Kolmou-sak</i> ; K.D. 120	October – April
<i>Ipomoea carnea</i> Jacquin ssp. <i>fistulosa</i> (Martius ex Choisy) Austin [Convolvulaceae]; <i>Pani-votora/Amarlota</i> ; K.D. 116	October – January
<i>Bacopa monnieri</i> (Linnaeus) Pennell [Scrophulariaceae]; <i>Brahmi-sak</i> ; K.D. 110	January – December
<i>Linnophila heterophylla</i> (Roxburgh) Benthham [Scrophulariaceae]; <i>Hial-bhobra/Patol-khar</i> ; K.D. 92	September – January
<i>Linnophila sessiliflora</i> (Vahl) Blume [Scrophulariaceae]; K.D. 51	May – August
<i>Lindernia crustacea</i> (Linnaeus) F. Müller [Scrophulariaceae]; K.D. 96	August – November
<i>Mazus pumilus</i> (Burman f.) Steenis [Scrophulariaceae]; K.D. 34	Almost round the year
<i>Scoparia dulcis</i> Linnaeus [Scrophulariaceae]; <i>Bondhonia/Mitha-paat</i> ; K.D. 35	Almost round the year
<i>Utricularia aurea</i> Loureiro [Lentibulariaceae]; <i>Patal-khar</i> ; K.D. 108	October – February
<i>Utricularia stellaris</i> Linnaeus f. [Lentibulariaceae]; K.D. 69	Monsoon & post-monsoon
<i>Dicliptera roxburghiana</i> Nees [Acanthaceae]; <i>Behna</i> ; K.D. 88	January – December
<i>Hygrophila auriculata</i> (Schumach) Heine [Acanthaceae]; <i>Kanta-karika</i> ; K.D. 98	November – January
<i>Lippia javanica</i> (Burman f.) Sprengel [Verbenaceae]; <i>Pichol-bon/Pahu-kuta</i> ; K.D. 104	Almost round the year but mostly during February – April

<b>Botanical names [Family]; Local Name; Exsiccatae</b>	<b>Flowers &amp; Fruits</b>
<i>Phyla nodiflora</i> (Linnaeus) Green [Verbenaceae]; <i>K.D.07</i>	April – August
<i>Leucas aspera</i> (Willdenow) Link [Lamiaceae]; <i>Doron</i> ; <i>K.D. 16</i>	April – September
<i>Alternanthera philoxeroides</i> (Martius) Grisebac [Amaranthaceae]; <i>Pani-khutura/Nol –duba</i> ; <i>K.D. 103</i>	April – May
<i>Alternanthera sessilis</i> (Linnaeus) R. Brown ex DC. [Amaranthaceae]; <i>Mati kaduri</i> ; <i>K.D. 19</i>	Almost round the year
<i>Amaranthus spinosus</i> Linnaeus [Amaranthaceae]; <i>Kata-khutura</i> ; <i>K.D. 04</i>	Almost round the year
<i>Amaranthus viridis</i> Linnaeus [Amaranthaceae]; <i>Khutura</i> ; <i>K.D. 31</i>	April – November
<i>Cyathula prostrata</i> (Linnaeus) Blume [Amaranthaceae]; <i>Bun-shath</i> ; <i>K.D. 20</i>	April – November
<i>Chenopodium album</i> Linnaeus [Chenopodiaceae]; <i>Bhatua-sak/Jilimil-sak</i> ; <i>K.D. 102</i>	March – June
<i>Persicaria barbata</i> (Linnaeus) H. Hara [Polygonaceae]; <i>Bon-ghehu</i> ; <i>K.D. 80</i>	August – December
<i>Persicaria glabra</i> (Willdenow) M. Gómez de la Maza [Polygonaceae]; <i>Bihlongoni</i> ; <i>K.D. 46</i>	March – October
<i>Persicaria hydropiper</i> (Linnaeus) Spach [Polygonaceae]; <i>Bonoria-gehu</i> ; <i>K.D. 15</i>	Almost round the year
<i>Polygonum plebeium</i> R. Brown [Polygonaceae]; <i>Bon-jaluk</i> ; <i>K.D. 101</i>	November – June
<i>Rumex dentatus</i> Linnaeus [Polygonaceae]; <i>Bon-suka</i> ; <i>K.D. 244</i>	November – May
<i>Rumex maritimus</i> Linnaeus [Polygonaceae]; <i>Tor-boura</i> ; <i>K.D. 12</i>	May – October
<i>Peperomia pellucida</i> (Linnaeus) Humboldt, Bonpland & Kunth [Piperaceae]; <i>Ponownoa</i> ; <i>K.D. 105</i>	September – February
<i>Chamaesyce thymifolia</i> (Linnaeus) Millspaugh [Euphorbiaceae]; <i>K.D. 17</i>	Almost round the year
<i>Euphorbia hirta</i> Linnaeus [Euphorbiaceae]; <i>Bor Gakhirati Bon</i> ; <i>K.D. 13</i>	Almost round the year
<i>Ricinus communis</i> Linnaeus [Euphorbiaceae]; <i>Era/Erigoch</i> ; <i>K.D. 18</i>	Almost round the year
<i>Pouzolzia zeylanica</i> (Linnaeus) Bennett [Urticaceae]; <i>K.D. 09</i>	June – October
<i>Ceratophyllum demersum</i> Linnaeus [Ceratophyllaceae]; <i>Sial-bhobora</i> ; <i>K.D.106</i>	January – June
<b>MONOCOTYLEDONES</b>	
<i>Blyxa aubertii</i> Richard [Hydrocharitaceae]; <i>K.D.188</i>	February – March
<i>Nechamandra alternifolia</i> (Roxburgh ex R. Wight) Thwaites [Hydrocharitaceae]; <i>K.D. 245</i>	October – February
<i>Hydrilla verticillata</i> (Linnaeus f.) Royle [Hydrocharitaceae]; <i>Sial-bhobra-khar/Patal khar</i> ; <i>K.D. 93</i>	October – February
<i>Ottelia alismoides</i> (Linnaeus) Persoon [Hydrocharitaceae ]; <i>Hentepa/Segun tepa</i> ; <i>K.D. 11</i>	Almost round the year
<i>Vallisneria natans</i> (Loureiro) H. Hara [Hydrocharitaceae]; <i>K.D. 87</i>	November – July
<i>Alpinia nigra</i> (Gaertner) B.L. Burtt [Zingiberaceae]; <i>Bogi – tora/Tora</i> ; <i>K.D. 08</i>	June – September
<i>Costus speciosus</i> (J. König) Smith [Costaceae]; <i>Jom-lakhuti</i> ; <i>K.D. 68</i>	August – October
<i>Eichhornia crassipes</i> (Martius) Solms [Pontederiaceae]; <i>Pani-Meteka</i> ; <i>K.D. 25</i>	Generally in summer
<i>Monochoria hastata</i> (Linnaeus) Solms [Pontederiaceae]; <i>Pani-meteka/ Meteka/ Bih-meteka/ Pani kochu/ Jathipatia/ Bothapatia</i> ; <i>K.D. 24</i>	May – August

<b>Botanical names [Family]; Local Name; Exsiccatae</b>	<b>Flowers &amp; Fruits</b>
<i>Monochoria vaginalis</i> (N.L. Burman) C. Presl ex Kunth [Pontederiaceae]; <i>Bhainsa-kachu</i> ; K.D. 03	June – November
<i>Commelina benghalensis</i> Linnaeus [Commelinaceae]; <i>Kona-simolu</i> ; K.D. 02	May – October
<i>Commelina paludosa</i> Blume [Commelinaceae]; K.D. 23	August – December
<i>Floscopa scandens</i> Loureiro [Commelinaceae]; K.D. 48	July – November
<i>Murdannia nudiflora</i> (Linnaeus) Brenan [Commelinaceae]; K.D. 58	July – October
<i>Typha domingensis</i> Persoon [Typhaceae]; <i>Maduri-bon</i> ; K.D. 49	July – September
<i>Colocasia esculenta</i> (Linnaeus) Schott [Araceae]; <i>Kochu</i> ; K.D. 56	June – December
<i>Lasia spinosa</i> (Linnaeus) Thwaites [Araceae]; <i>Cheng-mara</i> ; K.D. 200	January – August
<i>Pistia stratiotes</i> Linnaeus [Araceae]; <i>Bor-puni</i> ; K.D. 06	June – October
<i>Typhonium trilobatum</i> (Linnaeus) Schott [Araceae]; <i>Sama-kochu/Chamah</i> ; K.D. 43	August – September
<i>Lemna perpusilla</i> Torrey [Lemnaceae]; <i>Shoru-puni</i> ; K.D. 71	August – October
<i>Spirodela polyrhiza</i> (Linnaeus) Schleiden [Lemnaceae]; <i>Puni</i> ; K.D. 129	September – October
<i>Sagittaria guayanensis</i> Kunth subsp. <i>lappula</i> (D. Don) Bogin [Alismataceae]; <i>Jathipotia</i> ; K.D. 75	August – September
<i>Sagittaria trifolia</i> Linnaeus [Alismataceae]; <i>Pani-kochu</i> ; [K.D. 53]	July – September
<i>Potamogeton octandrus</i> Poirer [Potamogetonaceae]; K.D. 22	Almost round the year
<i>Eriocaulon cinereum</i> R. Brown [Eriocaulaceae]; K.D. 86	August – November
<i>Cyperus brevifolius</i> (Rottboell) Endlicher ex Hasskarl [Cyperaceae]; K.D. 01	March – November
<i>Cyperus compressus</i> Linnaeus [Cyperaceae]; <i>Mutha-bon</i> ; K.D. 21	May – December
<i>Cyperus iria</i> Linnaeus [Cyperaceae]; K.D. 42	July – October
<i>Cyperus kyllingia</i> Endlicher [Cyperaceae]; K.D. 169	July – October
<i>Cyperus rotundus</i> Linnaeus [Cyperaceae]; <i>Moth/Keya bon</i> ; K.D. 38	May – September
<i>Eleocharis dulcis</i> (N. L. Burman) Trinius ex Henschel [Cyperaceae]; K.D. 149	September – December
<i>Fimbristylis dichotoma</i> (Linnaeus) Vahl [Cyperaceae]; K.D. 66	March – December
<i>Fimbristylis miliacea</i> (Linnaeus) Vahl [Cyperaceae]; K.D. 85	May – November
<i>Rhynchospora corymbosa</i> (Linnaeus) Britton [Cyperaceae]; K.D. 134	March – December
<i>Scirpus articulatus</i> Linnaeus [Cyperaceae]; K.D. 84	October – November
<i>Scirpus juncooides</i> Roxburgh [Cyperaceae]; K.D. 184	October – November
<i>Chrysopogon aciculatus</i> (Retzius) Trinius. [Poaceae]; <i>Bon-guti</i> ; K.D. 64	Round the year
<i>Coix lacryma-jobi</i> Linnaeus [Poaceae]; <i>Kaurmoni/Kuamoni</i> ; K.D. 83	September – November
<i>Cynodon dactylon</i> (Linnaeus) Persoon [Poaceae]; <i>Dubori-bon</i> ; K.D. 82	March – May
<i>Digitaria ciliaris</i> (Retzius) Koeler [Poaceae]; K.D. 79	July – October
<i>Echinochloa crusgalli</i> (Linnaeus) P. Beauvois [Poaceae]; K.D. 139	August – November
<i>Eragrostis tenella</i> (Linnaeus) P. Beauvois ex Roemer & Schultes [Poaceae]; K.D. 81	October – November
<i>Eragrostis unioides</i> (Retzius) Nees ex Steudel [Poaceae]; K.D. 37	July – November
<i>Hemarthria compressa</i> (Linnaeus f.) R. Brown [Poaceae]; <i>Dudh-chaulia</i> ; K.D. 61	January – December
<i>Hygroryza aristata</i> (Retzius) Nees [Poaceae]; <i>Dol-dol/Petuli-dol</i> K.D. 78	October – April

Botanical names [Family]; Local Name; Exsiccatae	Flowers & Fruits
<i>Imperata cylindrica</i> (Linnaeus) Raeschel [Poaceae]; <i>Ulu-kher/Ulu-bon</i> ; K.D. 60	February – May
<i>Phragmites karka</i> (Retzius) Trinius ex Steudel [Poaceae]; <i>Nal-khagra/Khagra</i> ; K.D. 62	April – October
<i>Pogonatherum crinitum</i> (Thunberg) Kunth [Poaceae]; K.D. 57	June – November
<i>Saccharum spontaneum</i> Linnaeus [Poaceae]; <i>Kahua/Khagra/Khagori/Lihira/Kanhi-bon</i> ; K.D. 67	September–December
<i>Sacciolepis interrupta</i> (Willdenow) Stapf [Poaceae]; K.D. 63	July – November
<i>Vetiveria zizanioides</i> (Linnaeus) Nash [Poaceae]; <i>Binna/Birina/Mutha</i> ; K.D. 65	Almost round the year; mostly during June – December

**Table 2:** Remarks on the Aquatic and Wetland Angiospermic Macrophytes.

Sl. No.	Families	Genera	Species	Sl. No.	Families	Genera	Species
<b>Dicotyledons</b>				26	Scrophulariaceae	5	6
1	Ranunculaceae	1	2	27	Lentibulariaceae	1	2
2	Nymphaeaceae	2	3	28	Acanthaceae	2	2
3	Nelumbonaceae	1	1	29	Verbenaceae	2	2
4	Papaveraceae	1	1	30	Lamiaceae	1	1
5	Brassicaceae	1	1	31	Amaranthaceae	3	5
6	Cleomaceae	1	2	32	Chenopodiaceae	1	1
7	Caryophyllaceae	2	2	33	Polygonaceae	2	6
8	Portulacaceae	1	2	34	Piperaceae	1	1
9	Oxalidaceae	1	1	35	Euphorbiaceae	2	3
10	Balsaminaceae	1	1	36	Urticaceae	1	1
11	Papilionaceae	1	1	37	Ceratophyllaceae	1	1
12	Caesalpiniaceae	1	3	<b>Monocotyledons</b>			
13	Haloragaceae	1	1	1	Hydrocharitaceae	5	5
14	Melastomaceae	1	1	2	Zingiberaceae	1	1
15	Lythraceae	1	1	3	Costaceae	1	1
16	Onagraceae	1	2	4	Pontederiaceae	2	3
17	Trapaceae	1	1	5	Commelinaceae	3	4
18	Apiaceae	4	4	6	Typhaceae	1	1
19	Rubiaceae	1	1	7	Araceae	4	4
20	Asteraceae	7	7	8	Lemnaceae	2	2
21	Sphenocleaceae	1	1	9	Alismataceae	1	2
22	Menyanthaceae	1	2	10	Potamogetonaceae	1	1
23	Hydrophyllaceae	1	1	11	Eriocaulaceae	1	1
24	Heliotropaceae	1	1	12	Cyperaceae	5	11
25	Convolvulaceae	2	3	13	Poaceae	14	15
<b>TOTAL : Family 50; Genus 100; Species 128</b>							

## DISCUSSION

The present report is the outcome of the study based on the survey and collection of plant materials made during the year 2008 and 2009. A total of 128 aquatic and wet land angiospermic macrophyte species belonging to 100 genera and 50 families are recorded from Kamrup district, Assam (Table -2). Each plant has been enumerated with correct botanical name, locale name, flowering and fruiting time and uses (Table 1).

Poaceae is found to be predominant taxon on the basis of their total number of genera and species. The sequence of five (05) families according to their predominance on the basis of their total number of genera and species is given in Table -3.

**Table 3.** List of Angiospermic families according to their predominance on the basis of their total number of genera and species.

Based on the number of genera	Based on the number of species
Poaceae (14)	Poaceae (15)
Asteraceae (07)	Cyperaceae (11)
Cyperaceae (05)	Asteraceae (07)
Scrophulariaceae (05)	Scrophulariaceae (06)
Hydrocharitaceae (05)	Polygonaceae (06)

The dominant families in order of species richness (more than 5 species) are Poaceae, Cyperaceae, Asteraceae, Scrophulariaceae and Polygonaceae (Table 3). Numerical analysis of the species distribution revealed that 77 species belong to dicotyledons and 51 species to monocotyledons (Table 4). The proportion of monocotyledons to dicotyledones is 1:2.85, 1:1.44 and 1:1.51 for family, genera and species respectively (Table 5).

**Table 4.** Numerical analysis of species distribution

	Family	Genus	Species
<b>Dicotyledones</b>	37	59	77
<b>Monocotyledones</b>	13	41	51
<b>Total:</b>	<b>50</b>	<b>100</b>	<b>128</b>

**Table 5.** The ratio of Monocotyledon and Dicotyledon as revealed by the study

Ratio	Family	Genus	Species
<b>Monocotyledones and Dicotyledones</b>	1:2.85	1:1.44	1:1.51

## Acknowledgements

The author is grateful to University Grants Commission for financial assistance.

## LITERATURE CITED

- Barua, I.C. 1992. *Systematic studies of the angiosperms of Kamrup District, Assam*, Ph. D. Thesis, Gauhati University (Unpublished).
- Bentham, G. & Hooker, J.D. 1862 - 1883. *Genera Plantarum*. 3-vols. L. Reeve & Co Ltd, Ashford, Kent. London.



- Bhaskar, V. & Raji, B.A. 1973. *Hydrophytes and marsh plants of Mysore city*. Prasaranga, University of Mysore, Mysore, India
- Bhowmik, S.; Saha, R. & Datta, B.K. 2008. Aquatic and marshland plants in West Tripura, India. *Pleione* 2(1): 3 – 11.
- Biswas, K & Calder, C. 1937. *Handbook of common water and marsh plants of India and Burma*. Bishen Singh & Mahendra Pal Singh, Dehradun.
- Bor, N.L. 1940. *Flora of Assam*, Vol-5. Govt. of Assam, Shillong.
- Chavan, A.R. & Sabnis, S.D. 1961. A study of hydrophytes of Baroda and environs. *J. Ind. Bot. Soc.* 40: 121 – 130.
- Chowdhury, M. 2009. *Plant Diversity and Vegetation Structure in the Wetlands of Malda District of West Bengal, India*. Ph. D. Thesis, North Bengal University.
- Chowdhury, M. & Das, A.P. 2010. Hydrophytes of different wetlands in the Maldah District of West Bengal. *Environ. Biol. Conserv.* 15: 22 – 28.
- Chowdhury, M. & Das, A.P. 2011. Macrophytic diversity and community structure of *Adh Soi* wetland of Maldah district of West Bengal, India. In C. Ghosh & A.P. Das, *Recent Studies in Biodiversity and Traditional Knowledge in India*. Sarat Book House, Kolkata. Pp. 109 – 115.
- Chowdhury, S. 2005. *Assam's flora (Present Status of Vascular Plants)*. Assam Science Technology and Environment Council. U.N. Bezbaruah Road, Silpukhuri, Guwahati.
- Cook, C.D.K. 1996. *Aquatic and wetland plants of India*. Oxford University Press, N.Y.
- Fassett, N.C. 2000. *A manual of aquatic plants*. Agrobios (India), Jodhpur.
- Gopal, B. (ed).1990. *Ecology and management of aquatic vegetation in the subcontinent*, i-xiii, 1-257. Kluwer Academic Publishers, Dordrecht.
- Hooker, J.D. 1872-1897. *Flora of British India*, Vols. 1-7. L. Reeve & Co Ltd, Ashford, Kent. London.
- IUCN 1971. The Ramsar Conference : Final act of the International Conference on the conservation of wetlands and water fowl, suppl. *IUCN Bull.* 2(9):1 – 4.
- Jain, S.K. & Rao, R.R. 1978. *A hand book of field herbarium methods*. Today & Tommorrow's Printers & Publishers. New Delhi.
- Kachroo, P. 1984. *Aquatic Biology in India*. Bishen Singh Mahendra Pal Singh, Dehra Dun.
- Kanjilal, U.C; Das, A.; Kanjilal, P.C. & De, R.N. 1934 – 1940. *Flora of Assam* (Vol.I-IV). Govt of Assam, Shillong.
- Lavania, G.S.; Paliwal, S.C. & Gopal, B. 1990. Aquatic vegetation of the Indian subcontinent. In: (Ed.) Brij Gopal, *Ecology and Management of Aquatic vegetation in the Indian subcontinent*. Kluwer Academic Publishers, Dordrecht Boston/London. Pp. 29 – 76.
- Maheshwari, J.K. 1960. The Origin and Distribution of the naturalized plants of Khandwa Plateau, Madhya Pradesh. *J. Biol. Sci.* 3: 9 – 19.
- Majumdar, N.C. 1965. Aquatic and semiaquatic flora of Calcutta and adjacent localities. *Bull. Bot. Soc. Beng.* 19: 10 – 17.
- Malakar, N.C. (1995). *The systematic studies on the aquatic angiosperm of Cachar district of Assam*, Ph.D. Thesis, Gauhati University.
- Mirashi, M.V. 1954. Studies in the hydrophytes of Nagpur 1. A preliminary survey. *J. Indian Bot. Soc.* 33: 299 – 308.

- Pal, H. & Dutta Choudhury, M. 2010. New records of some sedges from southern Assam. *Pleione* 4(1): 143 – 147.
- Pathak, K.C. 1990. *Detailed study on Hydrophytic flora of Gawahati and its vicinity*. Ph.D. Thesis, Gauhati University.
- Pattnaik, H. & Pattanaik, N.K. 1956. The hydrophytes of Cuttack. *J. Indian Bot. Soc.* 35: 167 – 170.
- Rao, A.S. & Verma, D.N. 1969 (1972). Contribution to the Botany of North Lakhimpur Sub-division, Assam. *Ibid.* 11: 403 – 413.
- Raunkiaer, C. 1934. *The life forms of plants and statistical plants geography*. Clarendon Press, Oxford.
- Sarkar, S.; Deka, D. & Devi, N. 2008. Studies on some medicinally important wetland angiosperms used by the Bodo tribe of Kamrup District in Assam, India. *Pleione* 2(1): 20 – 26.
- Satyanarayana, G. 1962. Hydrophytic vegetation of Jalukbari. *Bull. Bot. Surv. India.* 4 (1-4): 217 – 218.
- Sen, D.N. & Chatterjee, U.N. 1959. Ecological studies on aquatic and swampy vegetation of Gorakhpur. *Agra Univ. J. Res. (Sci.)* 8(1): 17 – 29.
- Singh, A.K. 2006. A contribution to the Aquatic and Wetland flora of Varanasi. *J. Econ. Taxon. Bot.* 30(1): 6 – 24
- Subramanyam, K. 1962 *Aquatic angiosperms*. Botanical Monograph (3), CSIR, New Delhi.
- Tiner, R.W. 1992. The concept of a hydrophyte for wetland identification. *Bioscience* 41 (40): 236-247.
- Unni, K.S. 1967. Studies on the vegetation of ponds, swamps and river banks in Raipur, M.P. *J. Bomb. Nat. Hist. Soc.* 64: 95 – 102.
- Vyas, L. N. 1964. A study of hydrophytes and marsh plants of Alwar and environs. *J. Indian Bot. Soc.* 43: 7 – 30.