



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.



ISSN 1810-3030 (Print) 2408-8684 (Online)

Journal of Bangladesh Agricultural UniversityJournal home page: <http://baures.bau.edu.bd/jbau>, www.banglajol.info/index.php/JBAU**Weed diversity of the family Poaceae in Bangladesh Agricultural University campus and their ethnobotanical uses**

✉ Ashaduzzaman Sagar, Jannat-E-Tajkia and A.K.M. Golam Sarwar

Laboratory of Plant Systematics, Department of Crop Botany, Bangladesh Agricultural University, Mymensingh

ARTICLE INFO

**Abstract***Article history:*

Received: 03 July 2018

Accepted: 19 November 2018

Published: 31 December 2018

Keywords:

Grass weeds; Phenology;

Taxonomy; BAU campus;

Ethnobotanical uses

Correspondence:

Ashaduzzaman Sagar

✉: sagar@bau.edu.bd

A taxonomic study on the weeds of the family Poaceae growing throughout the Bangladesh Agricultural University campus was carried out to determine species diversity of grasses in the campus. A total of 81 species under 46 genera and 2 subfamilies of the family Poaceae were collected and identified; their uses in various ailments were also recorded. Out of the three subfamilies, no weed from the subfamily Bambusoideae was found. Among the genera, *Digitaria*, *Eragrostis*, *Brachiaria*, *Panicum*, *Echinochloa* and *Sporobolus* were most dominant in context to number of species with a total of 29 species. While 28 genera were represented by single species each in BAU campus; of these 15 genera were in Bangladesh as well. Some of them are major and obnoxious weeds in different crop fields including staples rice and wheat. The flowering period will be helpful for the management of respective weed population. Many of these weed species have high economical, ethnomedicinal and other uses. The phenological study of these weed taxa will be helpful in managing weeds of the family Poaceae of this campus as well as the whole country without affecting the agro-ecosystem by keeping the weed population below a threshold level.

Copyright:

©2018 by authors and BAURES. This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

Introduction

The family Poaceae (conserved name Gramineae), universally known as grass family, is the fifth largest plant family, following the Asteraceae, Orchidaceae, Fabaceae and Rubiaceae. It is the second most diverse family among monocotyledons (Bouchenak-khelladi *et al.*, 2010), with 780 genera and around 12,000 species of cosmopolitan distribution (Christenhusz and Byng, 2016). They are most plentiful in tropical and north-temperate semi-arid regions with seasonal rainfall. In Bangladesh, the family is represented by 3 subfamilies *viz.* Bambusoideae, Panicoideae and Pooideae, with 113 genera and 285 species (Ahmed *et al.*, 2008). All staple food and cereals like rice, wheat, corn, etc. is from this family. These grasses provide a vegetative cover, feed/fodder for animals, controls nutrient cycling, adds organic matter, acts as a soil binder, serves as an important source of genetic materials for crop improvement and used in the beautification of the landscapes. On the other hand, about 25% weeds of the world are monocotyledonous (Bryson and Carter, 2008); and grasses are one of the most troublesome and difficult group to control (Lym and Travnicek, 2015) because of their highly adaptive mechanisms and allelopathic properties (Noor *et al.*, 2012). They sometimes act as an alternative host of different diseases and pests in the absence of main crops. The outbreak of diseases occurs again when the relevant agricultural crops are cultivated

in the field. Thereby, the cost of production is increased and the quality of the products is reduced.

Bangladesh Agricultural University (BAU) is the largest university in Bangladesh and it covers about 486 hectares of land. It is situated in the Mymensingh division under the Old Brahmaputra Floodplain, Agro-ecological zone 9, of Bangladesh (UNDP, 1988). Three major topographic types like plain area, slightly undulated area and basin-shaped low lying area are present in the BAU campus which facilitates a wide range of habitats such as wetlands, marshy lands, open fields, bare lands, etc. (Sarwar and Prodhan, 2011; Jannat-E-Tajkia *et al.*, 2018). The soil category of the region varies from clay, clay loam to sandy loam (UNDP, 1988). The mean annual rainfall is 244.15 mm and the temperature varies from 11.9° to 32.5° C. The weather of this campus is not characterized by large extremes of heat, cold and rainfall. The winter period (November-December) is cool and almost rainless; whereas the summer season (June-October) is hot and humid, and during summer 90% or more of the whole rain occurs. This diverse climatic condition provides a suitable condition for the growth of grasses in the BAU campus.

In Bangladesh, the detailed taxonomic studies of weeds have been neglected by both the practising plant taxonomists and/or the agricultural scientists. Despite

Cite this article

Sagar A., Tajkia J.E. and Sarwar A.K.M.G. 2018. Weed diversity of the family Poaceae in Bangladesh Agricultural University campus and their ethnobotanical uses. *Journal of Bangladesh Agricultural University*, 16(3): 372–379.

the plenty of grasses in BAU campus, no momentous taxonomic study on grasses of this region has been made in the current years but only weeds of different specific crops were studied (Shabi *et al.*, 2018). Some studies were carried out on the occurrences of sedges in the BAU campus (Sarwar and Prodhan, 2011; Jannat-E-Tajkia *et al.*, 2018), but the species diversity of grasses in the campus was not conducted. Therefore, the current survey aimed at making an intensive taxonomic study of the weeds of Poaceae family in the BAU campus including their habitat, flowering period, ethnobotanical uses and economic importance; which may be useful for the green management practices and for getting higher economic benefits.

Materials and Methods

A rigorous field survey was carried out of the weeds of Poaceae family grown in BAU campus during 2015 to 2016. During the survey, fresh flowering samples were collected through the year round by frequent field visits (once a week). Other related information e.g., habitat, location, date, flowering time, crop/plant association, etc. were recorded during the field collection and by searching from published literature and online resources. Fresh samples were dried well for making voucher specimens. The collected fresh or dried specimens were identified by matching with herbarium specimens or published literature or consulting with experienced taxonomist at the Bangladesh National Herbarium, Dhaka. All the specimens are preserved in Prof. Dr. Arshad Ali Herbarium at the Botanical Garden, Department of Crop Botany, Bangladesh Agricultural University. The information related to use were collected from the published literature (Ahmed *et al.*, 2008; Sarwar and Prodhan, 2011).

Results and Discussion

A sum of 81 grass weed species under 46 genera and 2 sub-families of the family Poaceae were found in BAU campus (Table 1). The subfamily Panicoideae was represented by 31 genera and the subfamily Pooideae by 15 genera. Though crops from the subfamily Bambusoideae were present in the campus, weeds from this group were not found (Fig. 1) due to the limited selection of crops for the cultivation. Among the 46 genera, the most dominant 6 genera were *Digitaria* with 9 species, followed by *Brachiaria* (5), *Panicum* (3), and *Echinochloa* (3) which are from the subfamily Panicoideae and *Eragrostis* (6) and *Sporobolus* (3) are from the subfamily Pooideae. Moreover, these six genera together account for 29 species (35.8%) out of 81 weed species of this family in the BAU campus (Table 1). Again 28 genera were represented by single species each in BAU campus; of which 15 genera are represented by single species in Bangladesh as well. They are *Axonopus*, *Dimera*, *Erianthus*, *Heteropogon*, *Ichnanthus*, *Imperata*, *Ottochloa*, *Pseudechinolaena*,

Urochloa, *Zoysia*, *Aeluropus*, *Dactyloctenium*, *Elytrophorus*, *Hygroryza* and *Leersia* (Ahmed *et al.*, 2008; Table 1). The first nine of them were from Panicoideae and the rest were from the subfamily Pooideae.

The findings of this study revealed that some of these weeds are very common and major weeds in the rice, wheat, jute and other crop fields (Table 1; Bor, 1960; Gilliland, 1971). The most important grass weeds of Poaceae family in terms of their adverse effect on agriculture include *Cynodon dactylon*, *Echinochloa crus-galli*, *E. colona*, *Eleusine indica*, *Imperata cylindrica*, ranking 2nd, 3rd, 4th, 5th, and 7th among the world's worst weeds, respectively (Holm *et al.*, 1977; USDA, 2012). Some of them are very common weeds in garden crops like *Digitaria sanguinalis*, *Pennisetum glaucum*, etc. All of them are present in BAU campus (Table 1).

The ethnomedicinal and other uses of weeds from Poaceae family are much diversified (Table 1; Fig. 2) and also recorded in different ethnobotanical references (Uddin, 2006; Ahmed *et al.*, 2008). Some of them are very palatable fodder for cows, buffaloes, elephants, etc. Many of them are good soil binder and used as raw materials for paper industry, to decorate and soil binder for lawn and turf (Table 1). They have also a great medicinal use. Some of them are tonic for bone fracture, rat bite, bellyache after child birth, internal hemorrhage, convulsion, constipation, cardiac and liver diseases, etc. (Table 1; Fig. 3).

The proper management activities for weedy grasses are diverse. Cultural methods such as roguing, hoeing, tillage, different mulches or cover crop, draft ploughing, etc. are still used in the world to manage weeds including grasses and sedges (Shear, 1985). But, a cultural method of control such as mowing alone will not successfully manage certain perennial grass weeds rather it can prevent seed production if mowing intervals are shorter than the time necessary to set fertile spikelets (Shear, 1985). Therefore, it is necessary to know flowering periods to control the grass weeds. The phenologies were recorded here could be used to control them and these showed a wide variation (Table 1). Therefore, the grass weed populations can be managed below the critical level if proper steps can be taken before flowering. Therefore, the judicious and improved cropping pattern should be developed for additional high economic return from grass weeds of the family Poaceae without hampering our agro-ecosystem and crop yield as well.

Table 1. Weeds from the family Poaceae recorded in the Bangladesh Agricultural University campus

Sl.	Botanical Name	Bengali Name	English Name	Flowering Period	Habitat	Ethnobotanical & Economic Importance
1	<i>Acroceras munroanum</i> (Balansa) Henrard	–	–	April-August	Low, moist fields, margin of ponds, rice fieldsetc.	Fodder (Gilliland, 1971)
2	<i>Acroceras zizanioides</i> (Kunth) Dandy	–	Oat grass	June-October	Roadside, in or around watermarshy land, shady area etc.	Fodder (Gilliland, 1971)
3	<i>Aeluropus lagopoides</i> (L.) Thwaites	<i>Nona durba</i>	Mangrove grass	April-October	Low-lying places, sandy soils and arid places	Good fodder (Gilliland, 1971), Soil binder (Bor, 1960)
4	<i>Arthraxon lancifolius</i> (Trin.) Hochst.	–	–	August-December	Moist & shady situations, high land slopes, old fences	Fodder (Bor, 1960), Healing for disease
5	<i>Arthraxon nudus</i> (Steud.) Hochst.	<i>Gandha Bena</i>	–	September-March	Moist & shady situations, high land slopes, old fences	Soil binder (Bor, 1960)
6	<i>Arundinella bengalensis</i> (Spreng.) Druce	<i>Ganga Bena</i>	–	October-February	Railway side, high-land areas	Weed
7	<i>Axonopus compressus</i> (Sw.) P. Beauv.	<i>Ghora-dubo Har</i>	Carpet/Blanket/Savannah grass	Year around	Wide range of habitat and soils	Weed, Fodder (Gilliland, 1971), used in bone crack (Uddin, 2006).
8	<i>Bothriochloa pertusa</i> (L.) A. Camus	<i>Barboda ghas</i>	Hurricane/Barbados-sour grass	August-February	Bunds of fields, wetlands and open grassland	Fodder, Hay, Pasture (Bor, 1960)
9	<i>Brachiaria brizantha</i> (A. Rich.) Stapf	–	Bread Grass, Palisade Grass	September-December	Open and moist places with medium to high rainfall	Fodder, Hay, Soil binder (Bor, 1960; Skerman and Riveros, 1990)
10	<i>Brachiaria distachya</i> (L.) Stapf	<i>Cori ghas</i>	Cori grass	November-March	Bank of waterlands & wastelands	Fodder, Soil binder (Bor, 1960)
11	<i>Brachiaria mutica</i> (Frossk.) Stapf	<i>Nardul, Para ghas</i>	Para grass, Buffalo grass	November-March	Moist and wet grounds, bank of rivers, canals etc.	Weed, Fodder, Soil binder (Bor, 1960)
12	<i>Brachiaria reptans</i> (L.) C.A.Gardner & C.E.Hubb.	<i>Para ghas</i>	Creeping panic or running grass	August-September	Water-logged areas, wetlands & shade of bushes	Weed, Fodder (Bor, 1960)
13	<i>Brachiaria subquadripata</i> (Trin.) Hitchc.	<i>Cori ghas</i>	Green-summer grass	November-March	Bank of waterlands, wastelands & coastal areas	Fodder, Soil binder (Bor, 1960)
14	<i>Cenchrus ciliaris</i> L.	<i>Anjan Ghas</i>	African Foxtail	Year round	Water-logged areas, wetlands & shade of bushes	Excellent Fodder, Hay, Lawn grass (Bor, 1960)
15	<i>Centotheca lappacea</i> (L.) Desv.	–	Barbed grass	October-March	Wet zone, mostly in moist & shady floor	Excellent Fodder (Bor, 1960)
16	<i>Chloris barbata</i> Sw.	–	Swollen finger grass	April-May	Roadsides, open field, crop field and wetlands	Fodder at young (Bor, 1960)
17	<i>Chloris gayana</i> Kunth	–	Rhode's Grass	November-February	Grassland, open woodland, marshy land	Hay, Pasture lye, Soil binder, OM (Skerman and Riveros, 1990)
18	<i>Chrysopogon aciculatus</i> (Retz.) Trin.	<i>Premkanta, Chorkanta</i>	Grass Seed, Love Grass	Year around	Roadsides & railway sides	Weed, lawn grass (Bor, 1960), used in rat bite (Uddin, 2006)
19	<i>Cynodon dactylon</i> (L.) Pers	<i>Durba/Dubba ghas</i>	Bahama grass, Bermuda grass	July-December	Cultivated lands, moist or dry waste places, roadsides, lawn, and riversides	Weed, curing bellyache after childbirth (Kirtikar <i>et al.</i> , 1935), Fish poisoning and ureterolithiasis (Pal and Jain, 1998). Stop bleeding, Lawn grass, Soil binder (Bor, 1960).
20	<i>Cynodon radiatus</i> Roth	<i>Nil durba</i>	Bahama grass	March-September	Banks of rivers and rarely roadsides	Weed
21	<i>Cyrtococcum oxyphyllum</i> (Steud.) Stapf	<i>Oxycocca Ghash</i>	–	Year around	Marshy land and occasionally in grasslands	Good fodder (Gilliland, 1971)
22	<i>Cyrtococcum patens</i> (L.) A. Camus	<i>Patcocca ghas</i>	–	Year around	Shady habitat, especially as undergrowth in tree plant	Excellent fodder (Gilliland, 1971)
23	<i>Dactyloctenium aegyptium</i> (L.) Willd	<i>Makra</i>	Crowfoot grass, Beach wire-grass, Giant Button-grass	Year around	Sandy places of the lowlands	Lawn grass, fodder (Bor, 1960), Curing bellyache after childbirth (Kirtikar <i>et al.</i> , 1935), Fish poisoning and ureterolithiasis (Pal and Jain, 1998).

Table 1. Contd.

Sl.	Botanical Name	Bengali Name	English Name	Flowering Period	Habitat	Ethnobotanical & Economic Importance
24	<i>Dichanthium annulatum</i> (Forssk) Stapf	Loari	Sheda grass, Kleberg stem	January-June	Limestone hills and open grasslands	Excellent fodder, Erosion control (Bor, 1960).
25	<i>Dichanthium caricosum</i> (L.) A. Camus	Detara	Antigua Hay-grass, Blue grass	November-January	Open sunny places in dry season	Palatable fodder, Soil binder (Skerman and Riveros, 1990)
26	<i>Digitaria abludens</i> (Roem. & Schult.) Veldkamp	Chirichira	–	July-August	Open spaces, and fields of variety of soils	Weed
27	<i>Digitaria bicornis</i> (Lam.) Roem. & Schult.	–	Asian crab grass	March-September	Crop fields, roadsides, gardens and pastures	Fodder at young but weed at mature (Bor, 1960)
28	<i>Digitaria ciliaris</i> (Retz.) Koeler	Makur-jali, Kokjachira	Hairy/Wild Crab Grass	Year around	Wastelands, riverbanks, moist shady places and roadsides	Weed, Fodder grass (Skerman and Riveros, 1990)
29	<i>Digitaria ischaemum</i> (Schreb.) Muhl.	–	Smooth/small Crab Grass	June-August	Open spaces, and fields of variety of soils	Weed
30	<i>Digitaria longiflora</i> (Retz.) Pers.	–	False couch finger grass/ Indian crab grass	Year around	Roadsides and open grounds	Common fodder (Bor, 1960)
31	<i>Digitaria radicata</i> (J.Presl) Miq.	Timorese crab grass	Trailing crabgrass	September-November	Shady places, river banks & wastelands	Weed, Fodder (Bor, 1960)
32	<i>Digitaria sanguinalis</i> (L.) Scop.	Makunjali	Crab grass, Finger-grass	August-October	Cultivated and waste places, railway sides & dumps	Important fodder (Bor, 1960)
33	<i>Digitaria setigera</i> Roth	Sheti ghas	East Indian crab grass	Year around	River banks, wastelands, roadsides, crop fields etc.	Weed
34	<i>Digitaria stricta</i> Roth	Trick ghas	–	September-December	Lawns or cultivated lands	Good fodder grass (Bor, 1961)
35	<i>Dimera ornithopoda</i> Trin.	Pakhi daimara	–	August-March	Dry grassy spots of lowland, roadsides, broken wall	Weed
36	<i>Echinochloa colona</i> (L.) Link	Khudey shama ghas, shama dhan	Awnless barnyard grass, Jungle rice	May- September	Paddy fields, wastelands, fallow lands and shallow marshes	Weed of rice, fodder, vegetable (Pal and Jain, 1998). Helps in digestion
37	<i>Echinochloa crus-galli</i> (L.) P.Beauv.	Bara shama ghas	Barnyard-millet, Cockspur grass, water grass	April-October	Marshy and muddy waste lands and rice fields	Worst weed of paddy (Skerman and Riveros, 1990) and Vegetables (Purseglove, 1968). Grain fodder (Bor, 1960), and used in internal haemorrhage (Kirtikar <i>et al.</i> , 1935).
38	<i>Echinochloa stagnina</i> (Retz.) P.Beauv.	Dul, Parua	Floating barnyard/ hippo/ burgu grass	March-September	Marshy places, wetlands & paddy fields	Weed of paddy, fodder with high sugar (Bor, 1960; Purseglove, 1968)
39	<i>Eleusine indica</i> (L.) Gaertn.	Ghora dubboher, Mal-ankuri.	Crab grass, Goose grass, Crowfoot grass	June-August	Dry and wetlands, lawns, vegetable gardens, roadsides, wastelands and lowlands	Weed, Fodder with cyanogenetic effect but used at young (Bor, 1960). Used in convulsion, liver disorder & bone fracture (Kirtikar <i>et al.</i> , 1935)
40	<i>Elytrophorus spicatus</i> (Willd.) A.Camus	Jangli rala	Spike grass	December-February	Low flooded clayey sites, lowlands and mid-uplands	Weed
41	<i>Eragrostis cilianensis</i> (All.) Janch.	–	Stink grass, Grey love grass	June-November	Undergrowth of trees and high land	Occasionally fodder (Bor, 1960)
42	<i>Eragrostis coarctata</i> Stapf	Jinkua	Love grass	November-February	Dry places	Weed
43	<i>Eragrostis gangetica</i> (Roxb.) Steud.	Jinkua, Khari	Slim flower love grass	June-December	Lowlands, damp places, river beds and paddy fields	Weed
44	<i>Eragrostis japonica</i> (Thunb.) Trin.	–	Pond lovegrass	September-January	Damp soil near water-logged places, rivers and broken wall	Occasionally fodder (Bor, 1960)
45	<i>Eragrostis pilosa</i> (L.) P.Beauv.	–	Indian/Soft lovegrass	May-August	Sides of rivers, ponds, dry places and roadside.	Weed
46	<i>Eragrostis uniloides</i> (Retz.) Nees <i>ex</i> Steud.	Koni	Chinese lovegrass	Year around	Roadsides, banks of rivers and cultivated fields	Cosmopolitan weed, Fodder, Green manure (Mannetje and Jones, 1992)

Table 1. Contd.

Sl.	Botanical Name	Bengali Name	English Name	Flowering Period	Habitat	Ethnobotanical & Economic Importance
47	<i>Erianthus longisetus</i> Andersson	–	–	November-April	High land area	Weed
48	<i>Eriochloa fatmensis</i> (Hochst. & Steud.) Clayton	–	–	May-August	Wet and dry soil	Fodder of stock (Skerman and Riveros, 1990)
49	<i>Eriochloa procera</i> (Retz.) C.E.Hubb.	<i>Pelu, Kap ghas</i>	Cup grass	April-October	Damp places, paddy fields and banks of backwater.	Quick growing and succulent fodder
50	<i>Eulalia conorta</i> (Brongn.) Kuntze	<i>Eulali Ghash</i>	Golden velvet grass	September-February	Open grassy area and marshy land	Weed
51	<i>Eulalia leschenaultiana</i> (Decne.) Ohwi	–	–	November-January	Bunds of rice fields and roadsides	Weed
52	<i>Hemarthria protensa</i> Steud.	<i>Chailla</i>	Joint grass	May-October	Marshes, plain and high land	Weed
53	<i>Heteropogon contortus</i> (L.) P. Beauv. ex Roem. & Schult.	<i>Shukla, Kusal</i>	Pili grass, Black spear grass	August-January	Undergrowth of tree plants, marshy land	Seed wool fatal to sheep, can cause skin and eye disorder (Tohill and Backer, 1983)
54	<i>Hygroryza aristata</i> (Retz.) Nees ex Wight & Arn.	<i>Jangli dhan, Phutki</i>	Bengal wild rice	October-February	Dry area, tanks and marshes, paddy fields	Fodder (Bor, 1960), causes flatulence & constipation (Kirtikar <i>et al.</i> , 1935)
55	<i>Ichnanthus pallens</i> (Sw.) Munro ex Benth.	–	–	March-August	Damp, shady sites, mainly in wet region	Highly palatable fodder (Bor, 1960)
56	<i>Imperata cylindrica</i> (L.) Raeusch.	<i>Chhan, Chau, Kash, Sarkanb</i>	Cogon grass, Cotton wool-grass, Blady grass, Spear grass	Year around	Open tree area and roadside areas	Noxious weed in rice, tea, coffee, coconut, rubber, teak etc. Thaching grass, Paper industry, Fodder (Bor, 1960), Soil binder, Bouquet material, used in curing chest cold (Skerman and Riveros, 1990).
57	<i>Isachne globosa</i> (Thunb.) Kuntze	–	Swamp millet	Year around	Marshy places, rice fields, bank of rivers and ditches	Weed of paddy, Fodder and Green manure (Skerman and Riveros, 1990).
58	<i>Isachne scabrosa</i> Hook. f.	–	–	September-December	Open grassland and high land regions	Weed
59	<i>Leersia hexandra</i> Sw.	<i>Arali ghas, Jungli dhan</i>	Lambdora grass, Swamp rice grass	August-June	Sides of streams, backwater, canals, fallow lands	Weed of paddy, Fodder, Food of rodents (Skerman and Riveros, 1990)
60	<i>Leptochloa panicea</i> (Retz.) Ohwi	–	Mucronate Sprangletop	May-October	Dry waste places	Weed
61	<i>Oplismenus burmanni</i> (Retz.) P.Beauv.	<i>Kombo zara</i>	Wavy-leaf/ Burmann's basketgrass	September-January	Bunds, roadside, high land area, moist, shady places etc.	Fodder (Bor, 1960)
62	<i>Oplismenus compositus</i> (L.) P.Beauv	<i>Bashawa, Gohur</i>	Bamboo leaf grass	August-September	Undergrowth in tree plants and other shady places	Weed
63	<i>Ottochloa nodosa</i> (Kunth) Dandy	–	Slender panic grass	July-December	Lowlands, muddy river banks, wet sites etc.	Eaten by stock (Bor, 1960)
64	<i>Panicum brevifolium</i> L.	–	Shortleaf panic grass	March-December	Shady places of trees, riverbanks and 2° vegetation	Fodder (Bor, 1960)
65	<i>Panicum paludosum</i> Roxb.	<i>Barti, Boral</i>	Marsh/Swamp panic grass	Year around	Wet lands, marshes, and banks of backwater	Good Fodder for buffaloes and elephants (Bor, 1960)
66	<i>Panicum repens</i> L.	<i>Baranda, Dhani ghas</i>	Creeping panicum grass	Year around	Roadsides, margin of ditches, tanks, marshes, rice fields	Nutritious pasture (Bor, 1960), Used in eye disease (Pal and Jain, 1998).
67	<i>Paspalum conjugatum</i> P.J. Bergius	–	Buffalo grass, Carabao grass	Year around	Plantations, lawns, roadsides, other open grassy areas etc.	Weed of rice, Fodder and Lawn grass
68	<i>Pennisetum glaucum</i> (L.) R.Br.	<i>Bajra, Kauni, Banaspati ghas</i>	Bulrush millet, Pearl millet, Cumboo millet	September-December	Plains and hills	Forage (Bor, 1961), stalk as bedding, fencing and fuel (Skerman and Riveros, 1990), tonic in cardiac (Kirtikar <i>et al.</i> , 1935) and sexual disease (Pal and Jain, 1968)
69	<i>Pogonatherum crinitum</i> (Thunb.) Kunth	<i>Sunali-gash</i>	Bamboo grass	Year around	Tracks and banks of river and streams, broken wall, crevices of rocks and in shady places.	Weed
70	<i>Pogonatherum paniceum</i> (Lam) Hack.	–	Dwarf bamboo, Golden hair grass	March-September	Dry high land	Ornamental grass (Skerman and Riveros, 1990)

Table 1. Contd.

Sl.	Botanical Name	Bengali Name	English Name	Flowering Period	Habitat	Ethnobotanical & Economic Importance
71	<i>Pseudechinolaena polystachya</i> (Humb., Bonpl. & Kunth) Stapf	–	–	Year around	Shades of trees	Weed
72	<i>Pseudoraphis spinescens</i> (R.Br.) Vickery	–	Spiny mudgrasses	May-September	Stagnant water bodies, slow moving rivers and muddy surface of dried up area	Weed
73	<i>Sacciolepis indica</i> (L.) Chase	–	Glenwood grass	May-December	Moist grassy slopes with partial shades	Give grazing (Gilliland, 1971)
74	<i>Sacciolepis myosuroides</i> (R.Br.) A. Camus	Hill tauta	Cupscale grass	August-December	Moist or wet sites, marshes and rice fields	Weed of cultivated lands
75	<i>Schizachyrium brevifolium</i> (Sw.) Buse	–	Serillo Dulce	October-December	Lowlands, cultivated lands and open sandy area.	Poor fodder (Gilliland, 1971)
76	<i>Setaria viridis</i> (L.) P.Beauv.	Bhagar	Green foxtail	August-December	Bunds of paddy fields, roadsides and wastelands. Usually in moist habitat	Fodder (Bor, 1961)
77	<i>Sporobolus diandrus</i> (Retz.) P.Beauv.	Bina joni	Indian dropseed	March-October	Cultivated lands, grasslands, roadsides	Good fodder (Bor, 1961)
78	<i>Sporobolus indicus</i> (L.) R.Br.	–	Smut grass	Year around	Lowlands of dry or arid zones, usually in open and disturbed zone	Weed
79	<i>Sporobolus virginicus</i> (L.) Kunth	–	Drop seeds/ Sacaton grass	October-February	Wet lowlands	Weed
80	<i>Urochloa panicoides</i> P. Beauv.	–	Kuri millet, Liverseed grass	July-December	Low grasslands, paddy fields, wet sandy shores etc.	Weed, Cover grass (Skerman and Riveros, 1990)
81	<i>Zoysia matrella</i> (L.) Merr.	–	Korean/Manila temple grass	March-September	Dry and wet zone and sandy soil	Lawn grass, fodder, soil binder (Skerman and Riveros, 1990)

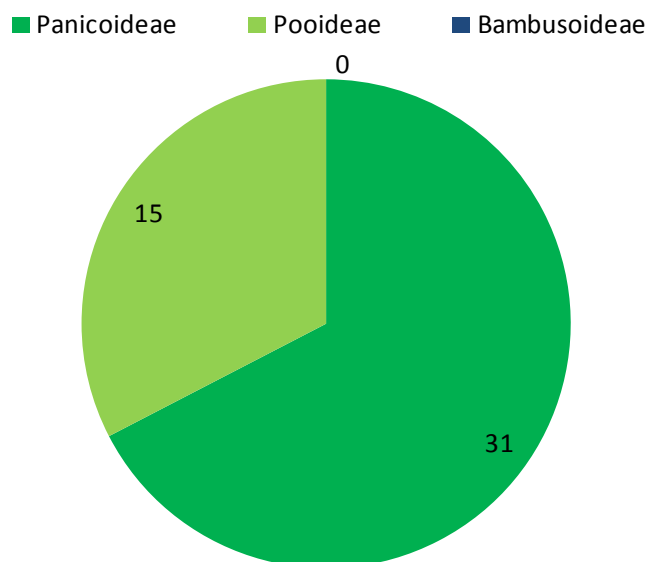


Fig. 1. Subfamilial distribution of genera of the family Poaceae from the BAU campus

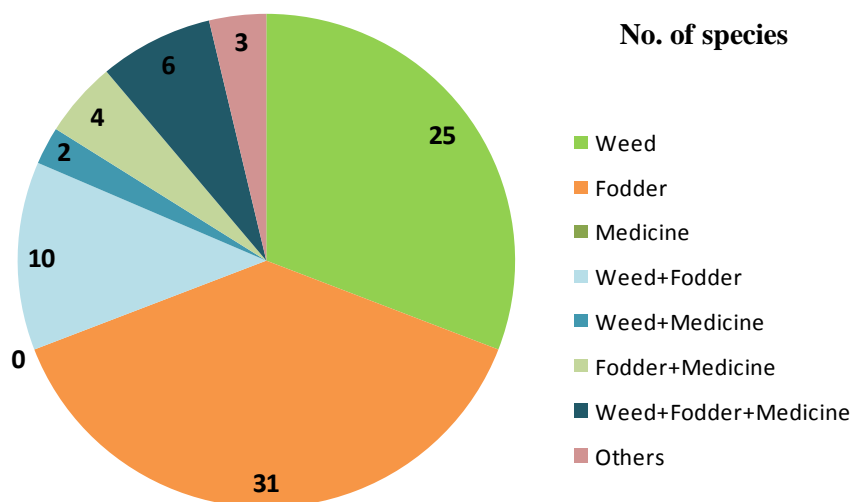


Fig. 2. Ethnobotanical uses of the species from the BAU campus

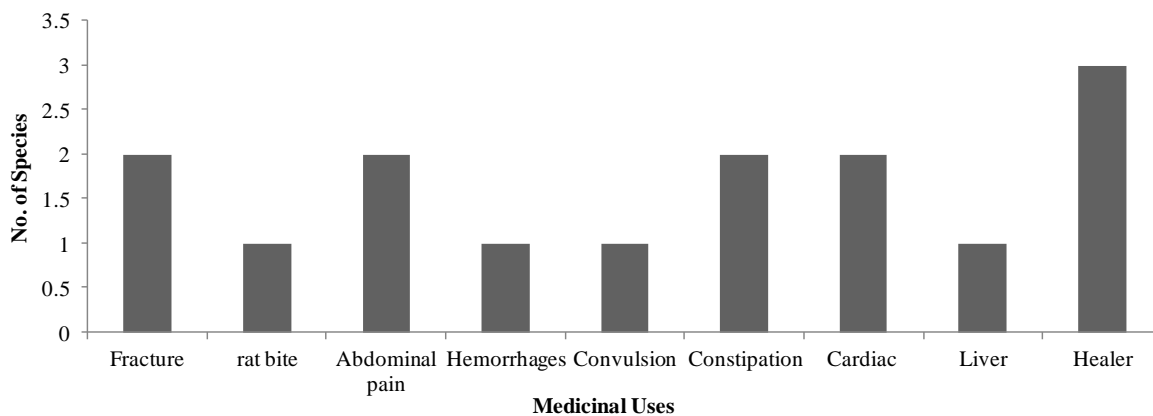


Fig. 3. Number of species from the BAU campus used for different ethnomedicinal purposes

Conclusion

A sum of 81 species under 46 genera and 2 subfamilies (Panicoideae and Pooideae) of the family Poaceae were collected and documented their use in various ailments. Out of the three subfamilies, weeds from Bambusoideae were not found. Among the genera, *Digitaria*, *Eragrostis*, *Brachiaria*, *Panicum*, *Echinochloa* and *Sporobolus* were most dominant, while 28 genera were found with single species in BAU campus. *Cynodon dactylon*, *Echinochloa crus-galli*, *E. colona*, *Eleusine indica* and *Imperata cylindrica* are major and common obnoxious weeds for rice, wheat and other crop fields. The flowering period of these weeds will be helpful for the management of weed population. A good number of these weeds have various economic, ethnomedicinal and other uses. Many of them are good fodder, soil binder, used as lawn and turf grass and have high medicinal value. The knowledge generated from the present research would be helpful for the management practices of grass weeds as well as for getting high economic benefits from beneficial species.

Acknowledgements

We grateful to Dr. S. Nasir Uddin, Principal Scientific Officer, Bangladesh National Herbarium for identification of some of the specimens, and acknowledge the Ministry of Science and Technology, Government of the People's Republic of Bangladesh.

References

Ahmed, Z.U., Hassan, M.A., Begum, Z.N.T., Khondker, M., Kabir, S.M.H., Ahmad, M., Ahmed A.T.A., Rahman, A.K.A. and Hoque, E.U. (eds). 2008. Encyclopedia of Flora and Fauna of Bangladesh, Vol. 12. Angiosperms: Monocotyledons (Orchidaceae - Zingiberaceae). pp. 152–425. Asiatic Society of Bangladesh, Dhaka.

Bor, N.L. 1960. The Grasses of Burma, Ceylon, India and Pakistan. pp. 767. Pergamon Press, London.

Bouchenak-khelladi, Y., Verboom, G.A., Savolainen, V. and Hodkinson, T.R. 2010. Biogeography of the grasses (Poaceae): a phylogenetic approach to reveal evolutionary history in geographical space and geological time. Botanical Journal of the Linnean Society, 162: 543–557. <https://doi.org/10.1111/j.1095-8339.2010.01041.x>

Bryson, C.T. and Carter, R. 2008. The significance of Cyperaceae as weeds. Monograph Systematic Botany Missouri Botanical Garden, 108: 15–101.

Christenhusz, M.J.M. and Byng, J.W. 2016. The number of known plants species in the world and its annual increase. Phytotaxa 261: 201–217.

<https://doi.org/10.11646/phytotaxa.261.3.1>

Gilliland, H.B. 1971. Flora of Malaya – Grasses. pp. 1-319. The Botanic Gardens, Singapore. PMCid:PMC2139034

Holm, L.G., Plucknett, D.L., Pancho, J.V., Herberger, J.P. 1977. The World's Worst Weeds: Distribution and Biology. University Press of Hawaii, Honolulu.

Jannat-E-Tajkia, Sagar, A. and Sarwar, A.K.M. Golam. 2018. Reassessment of cyperaceous weed biodiversity at Bangladesh Agricultural University campus. Journal of Bangladesh Agricultural University, 16: 221–226. <https://doi.org/10.3329/jbau.v16i2.37964>

Kirtikar, K., Basu, B.D. and an, I.C.S. 1935. Indian Medicinal Plants, Vols. 1-4. Bishen Singh Mahendra Pal Singh, Dehra Dun, India.

Lym, R.G. and Travnicek, A.J. 2015. Identification and control of invasive and troublesome weeds in North Dakota. pp. 1-76. NDSU Extension Service, USA.

Mannetje, L.T. and Jones, R.M. (eds.) 1992. Plant Resources of South-East Asia (Forages). pp. 1-300. Pudoc Scientific Publishers, The Netherland.

Noor, K., Khan, E.A., Baloch, M.S., Khan, M.A., Awan, I.U., Sadiq, M., Aslam, M. 2012. Allelopathic effect of congress grass on weeds and yield of wheat. Pakistan Journal of Weed Science Research, 18: 307–318.

Pal, D.C. and Jain, S.K. 1998. Tribal Medicine. pp. 1-317. Naya Prakash, India.

Purseglove, J.W. 1968. Tropical Crops (Monocotyledons). pp. 1-607. Longman Gr. Ltd., U.K.

Sarwar, A.K.M. Golam and Proddhan, A.K.M.A. 2011. Study on the Cyperaceous weeds of Bangladesh Agricultural University campus. Journal of Agroforestry and Environment, 5: 89–91.

Shabi, T.H., Islam, A.K.M.M, Hasan, A.K., Juraimi, A.S. and Anwar, M.P. 2018. Differential weed suppression ability in selected wheat varieties of Bangladesh. Acta Scientifica Malaysia 2: 1–7. <https://doi.org/10.26480/asm.02.2018.01.07>

Shear, G.M. 1985. Introduction and history of limited tillage. In: Wiese, A.F. (ed.), Weed Control in Limited-tillage Systems. pp. 1–14. Weed Science Society of America, USA.

Skerman, P.J. and Riveros, F. 1990. Tropical Grasses. pp. 1-832. FAO, Italy.

Tothill, J.C. and Backer, J.B. 1983. The grasses of southeast Queensland. pp. 1-300. University of Queensland Press, Queensland.

Uddin, S.N. 2006. Traditional uses of ethnomedicinal plants of the Chittagong Hill Tracts. pp. 1-992. Bangladesh National Herbarium, Dhaka. PMID:17010360

UNDP. 1988. Land resource appraisal of Bangladesh for agricultural development report 2: Agroecological Regions of Bangladesh. pp. 577. UNDP and FAO, Italy.

USDA. 2012. National Resource Conservation Service: Plant Database. Retrieved October 12, 2012, from <http://plants.usda.gov/java/>