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Documentation of Angiosperm Weed Flora in and around Rajshahi Metropolitan City, Bangladesh

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ABSTRACT

Documentation of angiosperm weed flora in and around Rajshahi metropolitan city, Bangladesh was carried out from January 2017 to December 2017. A total of 171 species belonging to 135 genera under 54 families were recorded. Magnoliopsida (Dicotyledones) is represented by 47 families, 115 genera and 146 species, whereas Liliopsida (Monocotyledones) by 07 families, 23 genera and 25

species. These comprise of 133 herbs, 23 shrubs, 15 climbers, belong to 54 families. Asteraceae, Amaranthaceae, Acanthaceae, Araceae, Convolvulaceae, Cyperaceae, Euphorbiaceae, Fabaceae, Lamiaceae, Molluginaceae, Poaceae, Polygonaceae, and Solanaceae were dominant families with high species diversity. Distribution of angiosperm weed species in the families shows variation. Asteraceae is represented by 26 species. Amaranthaceae is represented by 11 species. Acanthaceae is represented by 10 species. Each of Fabaceae and Poaceae is represented by 9 species. Euphorbiaceae is represented by 8 species. Solanaceae, Polygonaceae, Convolvulaceae and Araceae families are represented by 6 species each. Each of Lamiaceae, Molluginaceae and Cyperaceae, is represented by 4 species. A Single species in each was recorded by 21 families while 2-3 species was recorded by 20 families. For each species scientific name, local name, family name, habit, abundance and phenology are provided.

Keywords: Assessment, Angiosperm Weed Flora, Rajshahi, Bangladesh

1. INTRODUCTION

Weed may be defined as an undesirable plant growing where it is not wanted, or a plant out of place. Therefore, rye in a wheat field is a weed; so is a cornstalk or an oak tree in a peanut field. Weeds encompass all types of undesirable plants trees, broadleaves plants, grasses, sedges, rushes, aquatic plants, and parasitic flowering plants. Whether a plant is considered as a weed depends not only on its characteristics and habitat but also on its relative position with reference to other plants and man. While the term "weed" generally has a negative connotation, many plants known as weeds can have beneficial properties. A number of weeds, such as the dandelion (*Taraxacum*) and lamb's quarter, are edible, and their leaves or roots may be used for food or herbal medicine. Burdock is common over much of the world, and is sometimes used to make soup and medicine in East Asia (Burdock Root, 2015). Some weeds attract beneficial insects, which in turn can protect crops from harmful pests. Weeds can also prevent pest insects from finding a crop, because their presence disrupts the incidence of positive cues which pests use to locate their food. Weeds may also act as a "living mulch", providing ground cover that reduces moisture loss and prevents erosion. Weeds may also improve soil fertility; dandelions, for example, bring up nutrients like calcium and nitrogen from deep in the soil with their tap root, and clover hosts nitrogen-fixing bacteria in its roots, fertilizing the soil directly. The dandelion is also one of several species which break up hardpan in overly cultivated fields, helping crops grow deeper root systems. Some garden flowers originated as weeds in cultivated fields and have been selectively bred for their garden-worthy flowers or foliage. An example of a crop weed that is grown in gardens is the corncockle, (*Agrostemma githago*), which was a common weed in European wheat fields, but is now sometimes grown as a garden plant (Preston, 2002).

The importance of studying angiosperm weed species diversity has been realized and carried out in Bangladesh by Rahman *et al.* (2007; 2008), Rahman (2013), Rahman and Akter (2013), Rahman *et al.* (2014), Rahman and Gulshana (2014), Rahman and Rahman (2014), Rahman *et al.* (2015), Rahman and Parvin (2015), Roy *et al.* (2016), Sultana and Rahman (2016) and Uddin *et al.* (2014). The present research was undertaken to record the diversity of weed species in and around Rajshahi metropolitan city, Bangladesh.

2. MATERIALS AND METHODS

Study area: Rajshahi district is located at 24°22'23.91"N ,88°36'E which belongs to Bangladesh. Its covers an area of 2407 sq. km, is bounded by Naogaon district to the North, Natore district to the East, Chapai Nawabganj district to the West and the the river Padma to the South. It's commonly known as "Barriad Track". It consist of 9 upazilas, 4 Thanas, 13 Municipalities, 147 Wards, 297 Mahallas,70 union parishads, 1678 Mouzas and 1858 villages. The climate of Rajshahi is not characterized by great extremes of heat, cool and rainfall owing of the geographical situation of the district which ensures against the direct action of disturbing influences such as the sea in the south, the strong monsoon current in the east, and Himalayas to the north. The hot season commences early in the March with the cessation of the northerly wind. The winter begins from the middle of the October. Some other meteorological parameters are wind direction and sunshine. Normally there is very little discernible wind from the October to February. From the beginning of March the sun shifts from south to northern direction and day temperature increases and becomes windly. Thunderstorms locally named "KalBaishaki" with heavy rainfall and sometimes with hailstorms starts at the end of March and continues up to the end of May. The prevailing South- West monsoon wind brings heavy rainfall for the south region of the country at the early June (BPC, 2001).

Survey method: Documentation of angiosperm weeds growing in and around Rajshahi metropolitan city, Bangladesh was carried out from January 2017 to December 2017. A survey on the determination of the location of different species was made and a list

was prepared to be acquainted with the plants available in the selected area. All the species were noted and time to time the areas were visited to see when they flowered. For the morphological study, different types of species were examined carefully in order to see if there was any variation or not. They were collected at flowering stages and herbarium specimens were prepared as vouchers. In this practice standard method was followed (Alexiades, 1996).

Map of the study area

Plant Identification: The major collected materials were identified and described up to species with the help of Hooker (1961), Prain (1963), and Ahmed *et al*. (2007-2009) were consulted. For the current name and up-to-date nomenclature Pasha and Uddin (2013) and Huq (1986) were also consulted. All the collected plant specimens were kept in the Herbarium, Department of Botany, and University of Rajshahi, Bangladesh.

Natural vegetation of the study area

Field observations and sample collections in the study area

Herbarium preparation in the Plant Taxonomy Laboratory

3. RESULTS AND DISCUSSION

Documentation of Angiosperm weeds in and around Rajshahi metropolitan city, Bangladesh was carried out from January 2017 to December 2017. A total of 171 species belonging to 135 genera under 54 families were recorded. Magnoliopsida (Dicotyledons) is represented by 47 families, 115 genera and 146 species, whereas Liliopsida (Monocotyledons) by 07 families, 23 genera and 25

species. These comprise of 134 herbs, 23 shrubs, 15 climbers, belong to 54 families. Asteraceae, Amaranthaceae, Acanthaceae, Araceae, Convolvulaceae, Cyperaceae, Euphorbiaceae, Fabaceae, Lamiaceae, Molluginaceae, Poaceae, Polygonaceae, and Solanaceae were dominant families with high species diversity (Figure 3). Distribution of angiosperm species in the families shows variation. Asteraceae is represented by 26 species. Amaranthaceae is represented by 11 species. Acanthaceae is represented by 10 species, Each of Fabaceae and Poaceae is represented by 9 species. Euphorbiaceae is represented by 8 species. Solanaceae, Polygonaceae, Convolvulaceae and Araceae families are represented by 6 species each. Each of Lamiaceae, Molluginaceae and Cyperaceae, is represented by 4 species. A Single species in each was recorded by 21 families while 2-3 species was recorded by 20 families. Out of 171 species recorded, herbs are represented by 133 (77.78%), shrubs by 23 (13.46%) and climber by 15 species (8.77%) (Table 1; Figure 1). Out of 171 species recorded, 56.72% were frequent, 27.48% species were abundant and 15.78% were rare species in the study area (Figure 2).

Dicotyledons were more prominent than monocotyledons. These are *Stephania japonica, Tinospora cordifolia, Argemone mexicana, Pouzolzia indica*, *Boerhaavia diffusa, Boerhaavia repens, Chenopodium ambrosioides, Chenopodium album, Achyranthes aspera, Aerva sanguinolenta*, *Amaranthus spinosus, Amaranthus lividus*, *Amaranthus viridis, Portulaca oleracea, Glinus oppositifolius*, *Mollugo cerviana*, *Mollugo pentaphylla, Rumex maritimus, Mollugo oppositifolia*, *Polygonum hydropiper*, *Polygonum plebejum*, *Anagallis arvensis*, *Senna sophera*, *senna tora*, *Senna occidentalis*, *Vicia hirsuta*, *Vicia sativa*, *Acalypha indica, Ipomoea aquatica, Croton bonlandianum*, *Heliotropium indicum*, *Clerodendrum inerme, Euphorbia hirta, Euphorbia thymifolia, Saccharum spontaneum, Oxalis sensitiva, Emilia sonchifolia, Abroma augusta, Abutilon indicum, Xanthium indicum, Coccinia cordifolia, Cyperus rotundus, Cynodon dactylon, Commelina benghalensis,, Tridax procumbens, Wedelia chinensis, Parthenium hysterophorus, Grangea maderaspatana, Mimosa pudica, Laucas aspera, Chromolaena odorata, Enhydra fluctuans, Leucas cephalotes*, *Leonurus sibiricus* and *Eclipta alba*. Among the species studied, *Blumea laciniata* (Roxb.) DC., *Cyathula prostrata* L.,*Duranta repens* L.,*Clitorea ternatea* L and *Wedelia biflora* L. was very rare species in the study area. Out of the recorded species, *Boerhaavia diffusa ,Boerhaavia repens, Chenopodium ambrosioides,Chenopodium album, Achyranthes asspera, Amaranthus spinosus, Amaranthus lividus*, *Amaranthus viridis, Portulaca oleracea, Glinus oppositifolius*, *Mollugo cerviana*, *Mollugo pentaphylla, Rumex maritimus, Mollugo oppositifolia*, *Ipomea aquatica, Typhonium trilobatum, Colocasia esculenta, Alocasia indica, Xanthium indicum* were used as vegetables in the study area.

The collected information is comparable with the result of other studies in Bangladesh and abroad. A total of 56 weed species belonging to 17 families was identified in five different rice field around Vanurtaluk of Villupuram district, Tamil Nadu, India (Nithyaand Ramamoorthy, 2015). Twenty four weed species under 22 genera and 14 families were studied in 9 crop fields in West Bengal, India (Mondal and Hossain, 2015). A total of 40 plant species were growing as weeds in rice fields of Kashmir Valley, which belonged to 27 genera in 19 families (Hassan *et al*., 2015). A total of 71 weed species belonging to 65 genera and 32 families were recorded in wheat field of Rajshahi district, Bangladesh (Rahman *et al*., 2014). A total of 73 weed species belonged to 66 genera and 32 families are documented in paddy field of Rajshahi district, Bangladesh (Rahman and Rahman, 2014). A total of 37 weed species belonged to 36 genera and 20 families are documented in Mulberry field of Rajshahi University Campus, Bangladesh (Rahman and Mamun, 2017). A total of 23 species of 13 families were identified as weeds of wheat fields from five different localities of village Qambar, District Swat, Pakistan (Akhter and Hussain, 2007). A total of 73 weed species belonging to 65 genera and 27 families were recorded in sugarcane field of District Banu, Khyber Pakhtunkhawa, Pakistan (Khan *et al*., 2012). Twenty-two weed species belonging to 12 families were found dominant in greengram and blackgram in Haryana, India (Punia *et al*., 2013). A total of 39 weed species belonging to 37 genera and 19 families were recorded in mixed winter crop of Uttar Pradesh, India (Singh *et al*., 2012). A total of 58 weed species were recorded in wheat field of Nowshera District Rajouri (J & K), India (Dangwal *et al*., 2011). So far the information available, no published data recorded on the angiosperm weed species in and around Rajshahi metropolitan city, Bangladesh. The present research will be helpful for future reference.

Table 1 Assesment of Angiosperm weed flora in and around Rajshahi Metropolitan city, Bangladesh.

SL. No.	Scientific name	Local name	Family name	Habit	Abundance	Phenology
1	*Achyranthes aspera* L.	Apang	Amaranthaceae	Herb	Abundant	Jan. –Dec.
2	*Aerva sanguinolenta* L.	Karadia	Amaranthaceae	Herb	Rare	Sep.-Jan
3	*Aerva lanata* (L.) Juss.ex Schult	Chaya	Amaranthaceae	Herb	Abundant	Apr.-Jul.
4	*Alternanthera sessilis* L.	Chanchi	Amaranthaceae	Herb	Frequent	Jan. –Dec.
4	*Amaranthus spinosus* L.	Katanotey	Amaranthaceae	Herb	Frequent	Jan. –Dec.
6	*Amaranthus lividus* L	Goburanotey	Amaranthaceae	Herb	Frequent	Jan.-Apr.
7	*Amaranthus viridis* L.	Shaknotey	Amaranthaceae	Herb	Frequent	Jan. –Dec.
8	*Abroma augusta* L..	Ulotkambal	Sterculiaceae	Shrub	Frequent	Jun.- Oct.

9	*Abutilon indicum* L	Petari	Malvaceae	Small shrub	Frequent	Oct –Dec.
10	*Anagallis arvensis* L.	Anagalis	Primulaceae	Herb	Frequent	Jun.-Aug.
11	*Abrus precatorious* L.	Kuch	Fabaceae	Climber	Rare	Jul.-Aug.
12	*Alysicarpus vaginalis* (L).DC.	Pan nota	Fabaceae	Herb	Abundant	Jan.-Dec.
13	*Ammannia baccifera L.*	Jangli Mendi	Lythraceae	Herb	Rare	Nov.-Apr.
14	*Acalypha indica* L.	Muktajhuri	Euphorbiaceae	Herb	Abundant	Dec.-Apr.
15	*Andrographis painculata.* Wall ex Nees.	Kalomegh	Acanthaceae	Herb	Frequent	Jan.-Dec.
16	*Adhatoda vasica* Nees.	Basak	Acanthaceae	Shrub	Frequent	Jan.-Dec.
17	*Ageratum conyzoides* L.	Ochunti	Asteraceae	Herb	Frequent	Nov.-Jan.
18	*Alocaisa indica* (Roxb) Schott.	Mankachu	Araceae	Herb	Abundant	Jul.-Oct.
19	*Amorphollus campanulatus* L	Olkachu	Araceae	Herb	Abundant	Jan.-Dec.
20	*Axonopus compressus* L.	Shial kata	Poaceae	Herb	Frequent	Jul.-Dec.
21	*Argemone mexicana* L.	Shialkanta	Papaveraceae	Herb	Frequent	Jan.- Dec.
22	*Asperagus resemosus* L.	Sotomuli	Liliaceae	Climber	Frequent	Jan.- Dec.
23	*Acorus calamus* L.	Boch	Araceae	Herb	Frequent	Jan.- Dec.
24	*Aristolochia indica* L.	Iswarmul	Aristolochiaceae	Climber	Rare	Sep .-Dec.
25	*Boerhaavia diffusa* L.	Punornova	Nyctaginaceae	Herb	Frequent	Jan.- Dec.
26	*Boerhaavia repens* L.	Punornova	Nyctaginaceae	Herb	Frequent	Jan.- Dec.
27	*Barleria prionitis* L.	Kantajati, Swarnajhinti	Acanthaceae	Herb	Abundant	Jan.- Dec.
28	*Blumea lacera* (Burm.f.) DC.	Bara Kukshima	Asteraceae	Herb	Frequent	Nov.-Jul.
29	*Chenopodium album* L.	Batuashak	Chenopodiaceae	Herb	Abundant	Jun.-Oct.
30	*Chenopodium ambrosioides* L.	Chondonbita	Chenopodiaceae	Herb	Abundant	Mar.- Jun.
31	*Celosia argentea L.*	Morogtopa	Amaranthaceae	Herb	Rare	Dec.-Mar,
32	*Cyathula peostrata L.*	Boroapang	Amaranthaceae	Herb	Rare	Sep. -Nov.
33	*Ceratophyllum demersum,* L.	Chara,Jhanjhi	Ceratophyllaceae	Herb	Frequent	Jan.- Dec.
34	*Cissus quadrangularis* L.	Harjora	Vitaceae	Herb	Rare	Oct.-Jan.
35	*Cardiospermum helicacabum* L.	Noyaphutki	Sapindaceae	Herb	Common	Oct.-Jan.
36	*Chrozophora plicata* (Vahl) A. Juss.	Khudi okra	Euphorbiaceae	Herb	Rare	Mar.- Jan
37	*Croton bonlandianum* Baill.	Croton	Euphorbiaceae	Herb	Frequent	Jan.-Dec.
38	*Corchorus aculangulus* L.	Bonpat	Tiliaceae	Shrub	Frequent	Mar .-Feb.
39	*Coccinia cordifolia* (L.) Viogt.	Kolacucha	Cucurbitaceae	Climber	Frequent	Jul.- Dec.
40	*Coccinia grandis* (L.) Viogt.	Tela cucha	Cucurbitaceae	Climber	Frequent	Jul.- Dec.
41	*Cleome viscosa* L.	Holde Churchurey	Capparaceae	Herb	Frequent	Feb.- Dec.
42	*Clitoria ternatea* L.	Aparajita	Fabaceae	Shrub	Rare	Mar.-Aug.
43	*Calotropis procera* R.Br	Akando	Asclepiadaceae	Shrub	Frequent	Apr.-May
44	*Centella asiatica (L.) Urban*	Thankuni	Apiaceae	Herb	Frequent.	Mar.- Dec
45	*Clerodendrum inerme* (L.) Gaertn.	Bamunhati	Verbenaceae	Herb	Abundant	Jan.-Dec.
46	*Clerodendrum viscosum* Vent.	Bhat	Verbenaceae	Shrub	Frequent	Feb.- Apr.
47	*Colocasia esculenta* L.	Kachu	Araceae	Herb	Abundant	Mar.-Dec.
48	*Cirsium arvense* L	Shailkanta	Asteraceae	Herb	Frequent	Feb.- Dec.
49	*Chromolaena odorata* L	Asamlota	Asteraceae	Shrub	Abundant	Jan.-Oct.
50	*Cuscuta reflexa* Roxb.	Sarnolata	Cuscutaceae	Climber (Parasite)	Rare	Jan.- Dec.
51	*Commelina benghalensis* L.	Kanshira	Commelinaceae	Herb	Abundant	Apr.-Nov.
52	*Cyperus rotundus* L.	Mutha grahas	Cyperaceae	Herb	Frequent	Jan.- Dec.
53	*Cyperus triceps* Rottd	Ghash	Cyperaceae	Herb	Frequent	Jan.- Dec.
54	*Curcuma zedoaria* Christm	Shathi	Zingiberaceae	Herb	Rare	Sep.-Feb.
55	*Chrysopogon asciculatus* (Retz.) Trin.	Premkata	Poaceae	Herb	Frequent	Jan.- Dec.
56	*Cynodon dactylon* (L.) Pers.	Durva grass	Poaceae	Herb	Frequent	Jul.-Dec.
57	*Duranta repens* L.	Katamehedi	Verbenaceae	Shrub	Frequent	Jan.- Dec.
58	*Desmodium gangeticum* (L) DC.	Shalparni, pannata	Fabaceae	Herb	Frequent	Aug.-Nov.
59	*Desmodium triflorum* (L.) DC.	Kalilata	Fabaceae	Herb	Rare	Mar.- May
60	*Digera muricata* L.	Digera	Amaranthaceae	Herb	Rare	Jan.-Apr.
61	*Dopatrium junceum* (Roxb.) Buch.	Dopatrium	Scrophulariaceae	Aquatic	Abundant	Jan.- Dec.

				herb		
62	*Datura metel* L.	Dhutra	Solanaceae	Shrub	Frequent.	Jan.- Dec.
63	*Evolvulus nummularius* (L). L.	Bhuiamla	Convolvulaceae	Herb	Frequent	Jun.-Aug.
64	*Exacum pedunculatum* L	Exacum	Gentianaceae	Herb	Frequent	Feb.-Apr.
65	*Euphorbia helioscopia* L	Euphorbia	Euphorbiaceae	Herb	Abundant	Jun.-Jan.
66	*Euphorbia hirta* L.	Dudhiya	Euphorbiaceae	Herb	Abundant	Oct.-May
67	*Euphorbia thymifolia* L	Choti-dudhia	Euphorbiaceae	Herb	Frequent	Oct.-Feb.
68	*Eclipta alba* L.	Kalokesh	Asteraceae	Herb	Abundant	Jan.- Dec.
69	*Ethulia conyzoides* L.	Ethulia	Asteraceae	Herb	Rare	Jan.-May
70	*Enhydra fluctuans* Lour.	Helencha	Asteraceae	Herb	Frequent	Mar.- Jun
71	*Emilia sonchifolia* L.	Emili	Asteraceae	Herb	Frequent	Feb.- Aug.
72	*Eicchornia crassipies* L	Kochuripana	Pontederiaceae	Herb	Frequent	Jan.- Dec.
73	*Eleusine indica* (L.) Gaertn	Malankuri	Poaceae	Herb	Rare	Dec.- Feb.
74	*Fumaria officinalis* L.	Ban salpha	Fumariaceae	Herb	Rare	Feb.- Apr.
75	*Ficus pumila* L	Khoksa	Moraceae	Climber	Rare	Jan.- Dec.
76	*Glycosmis pentaphyla* L	Atisshor	Rutaceae	Shrub	Abundant	Feb.-Aug.
77	*Glinus oppositifolius* L	Gimma shak	Mulloginaceae	Herb	Abundant	Oct.-Jan.
78	*Gomphrena celosioides* Mart	Bonnobota phul	Amaranthaceae	Herb	Rare	Jun.- Oct.
79	*Gnaphalium polycaulon* L.	Bara karma	Asteraceae	Herb	Frequent	Mar.- Sep.
80	*Gnaphalium pulvinatum* Delile	Bara kamra	Asteraceae	Herb	Frequent	Feb.- Dec.
81	*Gnaphalium luteo-album* L.	Unknown	Asteracea	Herb	Rare	Jan.-Aug.
82	*Grangea maderaspatana* L.	Namuti	Asteraceae	Herb	Frequent	Jan.-Jun.
83	*Herpestis chamaedroides* Kunth	Herpestis	Scrophullariaceae	Herb	Rare	Jan.-Apr.
84	*Hyptis suaveolens* (L) Poit.	Bilatitulsi	Lamiaceae	Shru	Frequent	Aug.-Feb.
85	*Heliotropium indicum* L.	Hatishur	Boraginaceae	Herb	Abundant	Jan.- Dec.
86	*Houttuynia cordata* Thunb	Aishtya ghas	Sauruaceae	Herb	Rare	Mar.- Oct.
87	*Hygrophila auriculata*.L.	Kulekhara	Acanthaceae	Herb	Frequent	Aug-Mar
88	*Hemigraphis hirta* (Vahl.)T.Anderson	Buri pana	Acanthaceae	Herb	Frequent	Jan.- Dec.
89	*Hygrophylla schulli* M.R & S.N	Talmakhna	Acanthaceae	Herb	Frequent	Oct.-Jan.
90	*Ipomoea alba* L.	Dudhkalmi	Convolvulaceae	Shrub	Rare	Jan.- Dec.
91	*Ipomea aquatica* Forssk.	Kolmishak	Convolvulaceae	Herb	Frequent	Jan to Oct
92	*Ipomoea batatus* (L.) Lamk.	Mistialu	Covolvulaceae	Climber	Rare	Jan.- Dec.
93	*Ichnocarpus frutescens* L.	Dudhilate, syamalota	Apocynaceae	Shrub	Frequent	Jan.- Dec.
94	*Isachne globosa* (Thunb) Kuntze	Jhirjhirighash	Poaceae	Herb	Abundant	Jan.- Dec.
95	*Justicia gandarussa* L.	Jogotmordon	Acanthaceae	Shrub	Abundant	Dec.- May
96	*Ludwigia adscendens (L) Hara*	Kesordam	Onagraceae	Herb	Frequent	Jan.- Dec.
97	*Ludwigia perennis L.*	Amorkura	Onagraceae	Herb	Frequent	Jan.- Dec.
98	*Lantana camara* L.	Lantana	Verbenaceae	Shrub	Frequent	Aug.-Feb.
99	*Laucas aspera* (Willd) Link.	Shetodron	Lamiaceae	Herb	Frequent	Jan.-Dec.
100	*Leucas cephalotes* (Roth.) Spreng.	Dandakolos	Lamiaceae	Herb	Rare	Jan.-Feb.
101	*Leonurus sibiricus* L.	Roktodron	Lamiaceae	Herb	Rare	Jan.- Dec.
102	*Launaea asplenifolia* L.	Tikchaina	Asteraceae	Herb	Frequent	Jan.- Aug.
103	*Lasia spinasa* (L) Thw.	Kantakochu	Araceae	Herb	Frequent	Jan-Nov
104	*Monochoria vaginalis* (Burm, f) Prstl	Shorkochu	Pontederiaceae	Herb	Frequent	Jan.- Dec.
105	*Mullogo cerviana* L	Porpatopa	Mulloginaceae	Herb	Frequent	Jan.- Dec.
106	*Mollugo oppositifolius* L.	Gima, Gima-sak	Molluginaceae	Herb	Abundant	Jan.- Dec.
107	*Mollugo pentaphylla* L.	Julpapra	Molluginaceae	Herb	Abundant	Mar.-Jul.
108	*Melotheria maderaspatana* (L.) Cogn.	Melothirya	Cucurbitaceae	Herb	Frequent	Jan.-Sep.
109	*Mimosa pudica* L.	Lajjaboti	Mimosaceae	Herb	Frequent	Sep.-Oct.
110	*Melilotus indica* L.	Bonmethi	Fabaceae	Herb	Frequent	Jan.-Oct.
111	*Nicotina plumbaginifolia* Viv.	Bantamak	Solanaceae	Herb	Abundant	Jan.- Dec.
112	*Oxalis corniculata* L.	Amrul	Oxalidaceae	Herb	Abundant	Jan.- Dec.

113	*Oxalis rubra* L.	Boro amrul	Oxalidaceae	Herb	Frequent	Jan.- Dec.
114	*Oxalis sensitiva* L.	Panilajuk	Oxalidaceae	Herb	Frequent	Jan.-Aug.
115	*Oplismenus compositus* L.	Oplismenus	Poaceae	Herb	Abundant	Jan.- Dec.
116	*Physalis minima* L.	Kopalphutki	Solanaceae	Herb	Abundant	Sep.-Mar.
117	*Phyla nodiflora* L.	Bhui okra	Acanthaceae	Herb	Frequent	Feb.-Oct.
118	*Parthenium hysterophorus* L.	Parthenium	Asteraceae	Herb	Abundant	Jan.- Dec.
119	*Pistia stratiotes* L.	Khudipana	Araceae	Aquatic herb	Frequent	Jan.- Dec.
120	*Panicum repens* L.	Baranda	Poaceae	Herb	Abundant	Jan.- Dec.
121	*Passiflora foitida* L.	Jhomkolota	Passifloraceae	Herb	Rare	Jan.-Apr.
122	*Peperomia pellucida* L.	Luchi pata	Piperaceae	Herb	Frequent	Jan. – Mar.
123	*Pentapete sphoenicea* L.	Khoksa	Moraceae	Herb	Rare	Jan.- Dec.
124	*Portulaca oleracea* L.	Nunia shak	Portulacaceae	Herb	Frequent	Sep.- Mar.
125	*Pouzolzia indica* (L.) Bennet.	Sapura	Urticaceae	Herb	Frequent	Jan.-Aug.
126	*Persicaria barbatum* L.	Surojmoni	Polygonaceae	Herb	Frequent	Jan.-Apr.
127	*Polygonum hydropiper* L.	Panimorich	Polygonaceae	Herb	Abundant	Jan.- Dec.
128	*Polygonum plebejum* R. Br.	Chemti Sag	Polygonaceae	Herb	Rare	Oct.-Apr.
129	*Polygonum orientale* L.	Boropanimorich	Polygonaceae	Herb	Frequent	Jan.- Dec.
130	*Phyllanthus amarus* L.	Bhui-amla ,hazarmani	Euphorbiaceae	Herb	Abundant	Jan.- Dec.
131	*Phyllanthus urinaria* L.	Hazarmoni	Euphorbiaceae	Herb	Abundant	Jan.- Dec.
132	*Rumex maritimus* L.	Ban Palang	Polyganaceae		Frequent	Jun.-Sep.
133	*Ranunculus scleratus* L.	Potika	Runanculaceae	Herb	Rare	Jan.-Oct.
134	*Rauvolfia serpentina* (L.) Benth.	Sarpogandha	Apocynaceae	Herb	Frequent	Apr.-May .
135	*Rungia pectinata* L.	Pindi	Acanthaceae	Herb	Frequent	Jan.-Oct.
136	*Rungia repens* L	Pindi	Acanthaceae	Herb	Frequent	Jan.-Oct.
137	*Scoparia dulcis* L.	Bandhoney	Scrophulariaceae	Herb	Frequent	Jan.- Dec.
138	*Stephania Japonica (*Thunb) Miers.	Akanandi, Kanandi	Menispermaceae	Climber	Frequent	Jan.- Dec.
139	*Sida cordifolia* L.	Berella	Dilleniaceae	Herb	Frequent	Sep.-Dec.
140	*Sida cordata* L	Junka	Malvaceae	Herb	Frequent	Jan.- Dec.
141	*Senna sophera* L Roxb.	Kalkasunda	Cucurbitaceae	Herb	Frequent	Apr.-Jun.
142	*Senna tora* L	Chakunda	Fabaceae	Herb	Frequent	Sep.-Nov.
143	*Senna occidentalis* L	Kolkasunda	Caesalpiniaceae	Shrub	Frequent	Sep.-Dec.
144	*Solanum nigrum* L.	Tit Begun	Solanaceae	Herb	Abundant	Jan.- Dec.
145	*Solanum torvum* L.	Tit begun	Solanaceae	Herb	Abundant	Feb.-Apr.
146	*Solanum surattense L.*	Katabegun,kantakari	Solanaceae.	Herb	Frequent	Jan.- Dec.
147	*Sonchus asper* (L) Hill	Ban Palang.	Asteraceae	Herb	Abundant	Jan.- Dec.
148	*Sonchus arvensis* L.	Bonpalong	Asteraceae	Herb	Abundant	Jan.-Jul.
149	*Spilanthes calva* DC.	Marhatitiga	Asteraceae	Herb	Abundant	Mar.-Apr.
150	*Synedrella nodiflora* (L.) Gaertn	Synedrella	Asteraceae	Herb	Abundant	Jan.- Dec.
151	*Scripus articulatus* L	Chechur	Cyperaceae	Herb	Abundant	Jan.-Oct.
152	*Scripus grossus* L.f, Suppl.	Choto chechur	Cyperaceae	Herb	Frequent	Jan.-Oct.
153	*Saccharum spontaneum* L.	Kash	Poaceae	Shrub	Abundant	Sep.-Oct.
154	*Tridax procumbens* L.	Tridhara	Asteraceae	Herb	Frequent	Jan.-Dec.
155	*Typhonium trilobatum* L.	Ghetkochu	Araceae	Herb	Abundant	Jan.-Dec.
156	*Trapa bispinosa* Roxb.	Panifol	Trapaceae	Herb	Rare	Jun.-Sep.
157	*Tinospora cordifolia* (Willd) L.	Guloncho	Menispermaceae	Climber	Abundant	Jan.- Dec.
158	*Urena lobata* L.	Bon okra	Malvaceae	Shrub	Rare	Jan.- Dec.
159	*Uraria picta* Desv.	Sankarjata	Fabaceae	Herb	Rare	Jan.- Dec.
160	*Vicia hirsuta (L) Gray, Nat.*	Hatka	Fabaceae	Herb	Frequent	Jan.-Mar.
161	*Vicia sativa L*	Ankari, Hatka	Fabaceae	Herb	Frequent	Jan.-Aug.
162	*Vitis trifolia* L.	Bon angur	Vitaceae	Climber	Rare	May-Jul.
163	*Vernonia cinera* L.	Kukurmuta	Asteraceae	Herb	Frequent	Jan.-Aug.

164	*Vernonia patula* (Dryand.) Merr.	Kukshim	Asteraceae	Herb	Frequent	Jan.-Apr.
165	*Vitex negundo* L.	Nishinda	Verbenaceae	Shrub	Abundant	Feb.-Sep.
166	*Vetiveria zizanioides* L.	Binna ghass	Poaceae	Herb	Abundant	Jan.- Dec.
167	*Wedelia biflora* L.	Vringoraz	Asteraceae	Herb	Rare	Jan.- Dec.
168	*Wedelia chinensis* (Osbeck) Merr.	Mohavringaraj	Asteraceae	Herb	Common	Feb.-Aug.
169	*Wedelia trilobata* L.	Wedelia	Asteraceae	Herb	Rare	Jan.- Dec.
170	*Xanthium indicum J. Koening ex Roxb.*	Hagra	Asteraceae	Herb	Frequent	Jan.- Dec.
171	*Youngia japonica* L.	Youngia	Asteraceae	Herb	Frequent	Aug.-Dec.

Jan.=January, Feb.=February, Mar.=March, Apr.=April, May=May, June=June, Jul.=July, Aug.=August, Sep.=September, Oct.=October, Nov.=November, Dec.= December

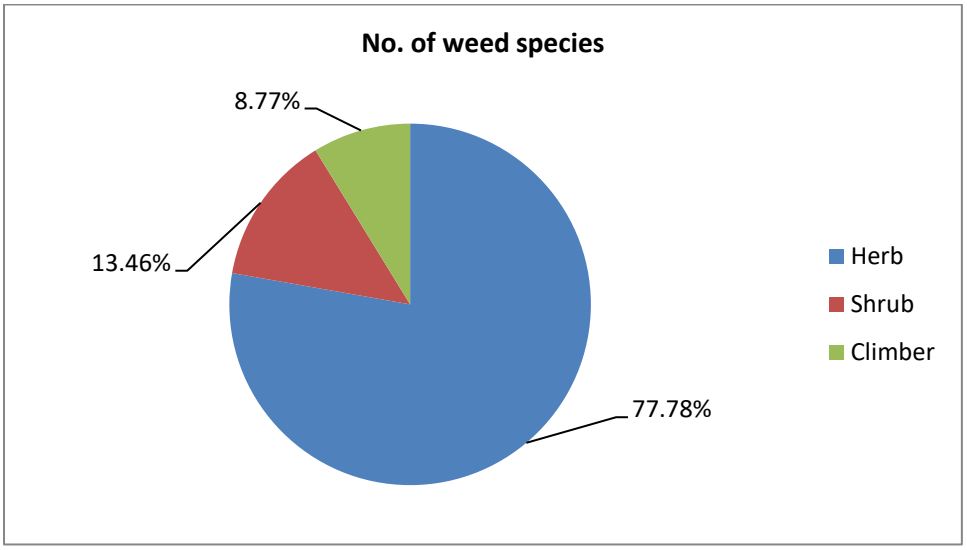

Figure 1 Recorded weed diversity in the study area

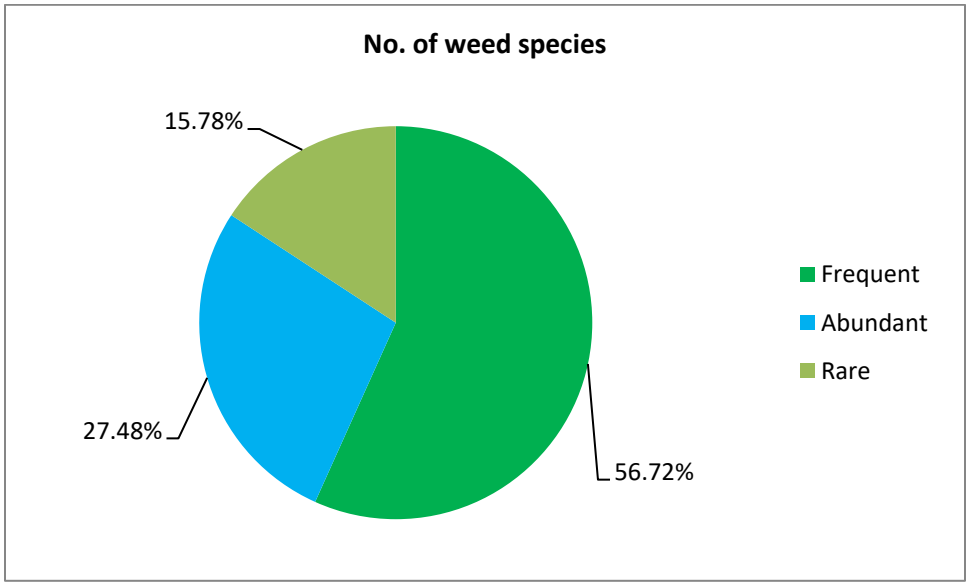

Figure 2 Recorded abundance in the study area

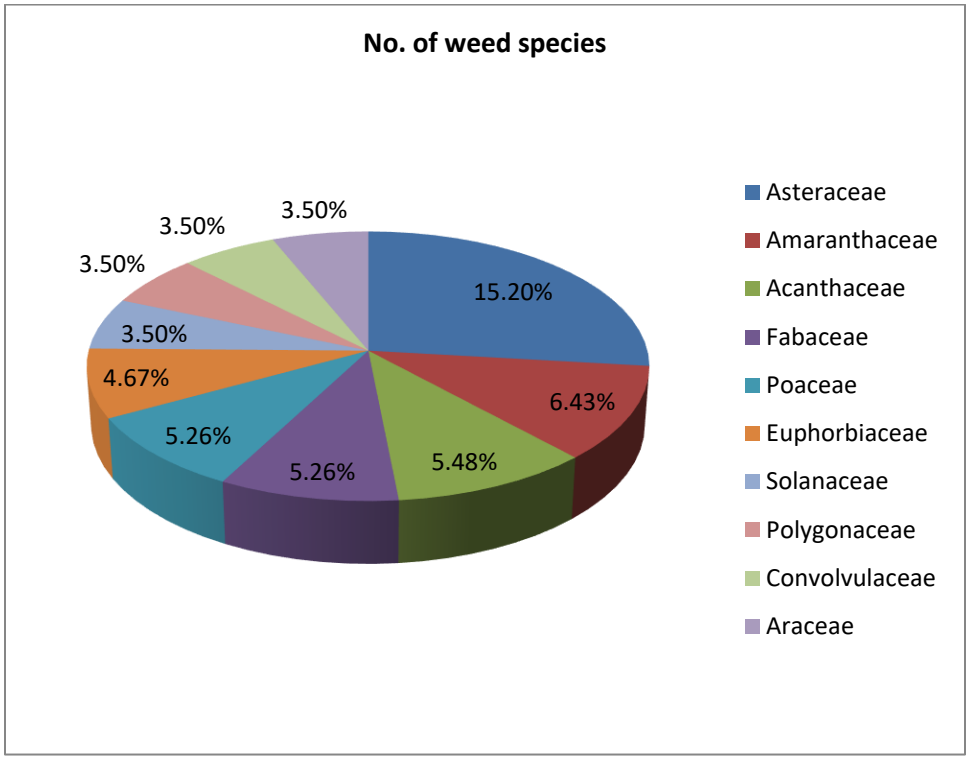

Figure 3 Recorded dominant families in the study area

Important weed species in the study area

Uraria picta

Vicia hirsuta

Vicia sativa

Xanthium indicum

Ammannia baccifera

Ludwigia adscendens

Luduwigia perennis

Acalypha indica

Chrozophora plicata

Croton bonplandianum

Euphorbia helioscopia

Euphorbia hirta

Evolvulus nummularius

Phyllanthus niruri

Phyllanthus urinaria

4. CONCLUSION

Documentation of angiosperm weed flora in and around Rajshahi metropolitan city, Bangladesh was recorded. A total of 171 species belonging to 135 genera under 54 families were recorded. Asteraceae, Amaranthaceae, Acanthaceae, Araceae, Convolvulaceae, Cyperaceae, Euphorbiaceae, Fabaceae, Lamiaceae, Molluginaceae, Poaceae, Polygonaceae and Solanaceae were dominant families with high species diversity. The present study will also help in identifying the important angiosperm weeds for further investigation.

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All data associated with this study are present in the paper.

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