Plant Environment Development, Vol. 9(1): 1-9, 2023 (June)
Department of Botany, University of Rajshahi,
Rajshahi 6205, Bangladesh
E-mail: plant.environ.dev@ru.ac.bd

Print ISSN 1994-1501
Online ISSN 2311-3529
http://plantenvdev.com

Research Paper

Study of Angiosperm Weeds around the Rajshahi University Campus

Humayra Khatun and A.H.M. Mahbubur Rahman*

Plant Taxonomy Laboratory, Department of Botany, Faculty of Biological Sciences, University of Rajshahi, Rajshahi 6205, Bangladesh
*Corresponding author: drrahmanahmm@ru.ac.bd

Abstract

Diversity of angiosperm weeds was studied around the Rajshahi University Campus during October 2021 to October 2022. A total of 94 species belonging to 70 genera under 36 families were recorded. Magnoliopsida (Dicotyledones) is represented by 31 families, 58 genera and 80 species, whereas Liliopsida (Monocotyledones) by 05 families, 12 genera and 14 species. Distribution of angiosperm weed species in the families shows variation. Asteraceae is represented by 15 species. Amaranthaceae is represented by 5 species. Acanthaceae is represented by 3 species. Poaceae is represented by 8 species. Euphorbiaceae is represented by 7 species. Solanaceae is represented by 4 species, Polygonaceae is represented by 4 species, Each of Convolvulaceae, Verbenaceae, Marsileaceae, Onagraceae families are represented by 3 species. Each of Molluginaceae, Caesalpiniaceae, Oxalidaceae, Chenopodiaceae and Nyctaginaceae is represented by 2 species. A single species in each was recorded by 18 families. For each species voucher number, scientific name, local name, family, habit, flowering time and status of occurrence are provided.

Keywords: Diversity, Weed Flora, Angiosperms, Rajshahi University Campus, Bangladesh

INTRODUCTION

A weed is generally considered to be a plant grows where it is not agronomically wanted. A better definition is that it is a plant that has the capacity to invade cultivated or disturbed land or natural ecosystems. Many weeds are short lived annual plants. That normally takes advantage of temporarily bare soil produce another generation seed before the soil is covered over again by slower growth. With the advent of agriculture, with extensive areas of ploughed soil exposed every year, the opportunities for supplants have been greatly expanded. Weed derives from the old English word for grass or herb, but during Middle Ages the meaning has changed to indicate an undesirable plant that grows where it is not wanted especially among agricultural plots. Weeds are unnecessary plants because they are dropping crop yield by competing with crop plants for common resources such as water mineral nutrients space and light. A weed is any plant that requires some form of action to reduce its effect on economy the environment, human health and amenity (Naik, 2003).

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 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 taproot, 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 comcockle, (Agrostemmagithago), which was a common weed in European wheat fields, but is now sometimes grown as a garden plant (Priston and Dines, 2002).

Angiospermic weed flora was carried out in Bangladesh by Zahra and Rahman (2018), Uddin and Hassan (2010), Uddin et al (2013), Uddin et al (2014), Sultana and Rahman (2016), Sarker and Rahman (2016, 2017, 2019), Roy and Rahman (2018), Rahman et al (2014), Rahman et al (2007), Rahman et al (2008), Rahman (2021), Debnath and Rahman (2017), Rahman and Mamun (2017), Islam and Rahman (2017), Sultana and Rahman (2016), Nahar and Rahman (2016), Roy and Rahman (2018), Ismail and Rahman (2016), Rahman and Jamila (2015), Rahman and Parvin (2015), Uddin et al (2014), Rahman and Gulshana (2014), Rahman and Rahman (2014), Rahman (2013), Rahman and Debnath (2014), Rahman et al (2014), Rahman and Rojonogondha (2014), Rahman and Keya (2014), Kona and Rahman (2015), Keya and Rahman (2017), Rahman and Akter (2013). The objective of the present study was exploring to and assesses the diversity of angiosperm weed flora around the Rajshahi University campus.

MATERIALS AND METHODS

The work was conducted during October 2021 to October 2022 to cover the seasonal variations of collected materials having twenty eight visits of the study areas. The visits covered all types of habitats, particular riverbank; char land area, slope, village grove, fruit gardens, fallow lands, crop fields, roadsides of the study area. Plant parts with either flowers or fruits were collected using traditional herbarium techniques to make voucher specimens for documentation.

Collected angiosperm weeds were identified with the respective reference books (Hooker, 1877), (Prain, 1903) and (Ahmed *et. al.,* 2008-2009). The current name and up-to-date nomenclature Huq (1986); Pasha and Uddin (2013) were also followed.

RESULTS AND DISCUSSION

Diversity of angiosperm weeds was counted. A total of 94 species belonging to 70 genera under 36 families were recorded. These were comprised of 80 herbs, 9 shrubs, 5 climbers, belongs to 36 families. Asteraceae, Amaranthaceae, Acanthaceae, Convolvulaceae, Euphorbiaceae, Lamiaceae, Poaceae, Polygonaceae, Onagraceae, and Solanaceae were noted dominant families with high species diversity. Magnoliopsida (Dicotyledones) is represented by 31 families. 58 genera and 80 species, whereas Liliopsida (Monocotyledones) by 05 families, 12 genera and 14 species.

Distribution of angiosperm weeds in the families shows variation. Asteraceae is represented by 15 species whereas Amaranthaceae by 5 species, Acanthaceae by 3 species. Poaceae comprised by 8 species and Euphorbiaceae represented by 7 species. Solanaceae represented by 4 species, Polygonaceae represented by 4 species, Each Convolvulaceae, Verbenaceae, Marsileaceae, Onagraceae families are represented by 3 species. Each of Molluginaceae, Caesalpiniaceae, Oxalidaceae, Chenopodiaceae and Nyctaginaceae, is represented by 2 species. Each single species was recorded by 18 families. Habit analysis shows that herbs, shrubs, and climbers are represented by 80, 09 and 05 species respectively (Table 1).

Out of 94 species recorded, herbs were represented by 80 (85.11%%), shrubs by 09(9.57%) and climber by 5 species (5.32%) (Fig.1). Out of the recorded species, Asteraceae (15.94%), Poaceae (8.51%), Euphorbiaceae (7.45%), Amaranthaceae (5.32%), Polygonaceae (4.25%) and Solanaceae (4.25%) were the dominant families in the study area (Fig. 2). Out of 94 species recorded, 57.44% were frequent, 30.86% species were abundant and 11.70% were rare species in the study area (Fig. 3).Out of species recorded, 55.32% were native, 44.68% species were exotic species in the study area (Fig. 4). For each species botanical name, local name, habit, flowering time, status of occurrence, voucher number and family were provided.

The collected information is comparable with the result of other studies in Bangladesh and abroad. The Mulberry Field of Rajshahi University Campus, Bangladesh grown 37 weed species which are belonging to 36 genera and 20 families (Rahman and Mamun, 2017). In the mixed winter crop of Uttar Pradesh, India a total of 39 weed species belonging to 37 genera and 19 families were reported (Singh et al., 2012). A total of 56 weed species from 17 families have been discovered in five different

rice fields in the Vanurtaluk district of Villupuram, Tamil Nadu, India (Nithyaand Ramamoorthy, 2015). On the other hand, 24 weed species belonging to 22 genera and 14 families were studied of nine crop fields in West Bengal, India (Mondal and Hossain, 2015). A total of 40 plant species in 19 families grew as weeds in Kashmir Valley rice fields which belonged to 27 genera (Hassan et al., 2015). In the village of Qambar, 23 species from 13 families have been identified as wheat field weeds in five different Fields, District Swat, Pakistan (Akhter and Hussain, 2007). In sum, 58 weed species were reported in the Nowshera District Rajouri (Jammu and Kashmir) wheat field, India (Dangwal et al., 2011). A total of 73 weed species from 65 genera and 27 families have been reported in District Banu sugarcane field, Khyber Pakhtunkhawa, Pakistan (Khan et al., 2012). Currently, no published data on angiosperm weeds found around the Rajshahi University Campus. The present study will be helpful for further investigation with a view of categorizing the proper biological spectra of angiosperm weeds.

Table 1: Assessment of angiosperm weeds around the Rajshahi University Campus

Sl. No.	Scientific name	Local name	family	Habit	Relative occurrence	Flowering time	Voucher number
1	*Achyranthes aspera* L.	Apang	Amaranthaceae	Herb	Abundant	Jan-Dec	HK-1
2	*Acalypha indica* L.	Muktajhuri	Euphorbiaceae	Herb	Abundant	Sep-Jun	HK-2
3	*Ageratum conyziodes* L.	Ochunti, Fulkuri	Asteraceae	Herb	Abundant	Nov-Jan	HK-3
4	*Alternanthera sessile* R.Brown.	Chanchi	Amaranthaceae	Herb	Abundant	Jan-Dec	HK-4
5	*Amaranthus spinosus* L.	Kantanotey	Amaranthaceae	Herb	Abundant	Jan-Dec	HK-5
6	*Amaranthus viridis* L.	Shaknotey	Amaranthaceae	Herb	Abundant	Jan-Dec	HK-6
7	*Anagalis arvensis* L.	Anagalis	Primulaceae	Herb	Frequent	Jan-Mar	HK-7
8	*Anoxopus compressus* L.	Shialkata	Poaceae	Herb	Frequent	Jan-Dec	HK-8
9	*Andrographis paniculata* Wall.	Kalomegh	Acanthaceae	Herb	Frequent	Jul-Jan	HK-9
10	*Argemone mexicana* L.	Shialkata	Papaveraceae	Herb	Frequent	Feb-Apr	HK-10
11	*Boerhaavia diffusa* L.	Punarnava	Nyctaginaceae	Herb	Frequent	Jan-Dec	HK-11
12	*Boerhaavia repens* L.	Punarnava	Nyctaginaceae	Herb	Frequent		HK-12
13	*Chenopodium album* L.	Batuasak	Chenopodiaceae	Herb	Abundant	Jan-Mar	HK-13
14	*Chenopodium ambrosioides* L.	Bon Batuasak	Chenopodiaceae	Herb	Frequent	Jan-Apr	HK-14
15	*Coccinia cordifolia* L.Vigot	Telakucha	Cucurbitaceae	Climber	Frequent	May-Oct	HK-15
16	*Coccinia grandis* (L.) Voigt.	Telakucha	Cucurbitaceae	Climber	Frequent	Jun-Dec	HK-16
17	*Croton bonplandianus* Baill.	Bon morich	Euphorbiaceae	Herb	Frequent	Jan-Dec	HK-17
18	*Commelina benghalensis* L.	Kanshira	Commelinaceae	Herb	Frequent	Feb-Jul	HK-18
19	*Cyperus rotundus* L.	Muthaghas	Cyperaceae	Herb	Frequent	Jan-Dec	HK-19
20	*Cyperus triceps* L.	Ghash	Cyperaceae	Herb	Frequent	Jan-Dec	HK-20
21	*Chrysopogon aciculatus* (Retz.)	Premkata	Poaceae	Herb	Frequent	Jan-Dec	HK-21
22	*Colocasia esculenta* (L) Schott.	Kochu	Araceae	Herb	Abundant	Dec-Mar	HK-22
23	*Centella asiatica* (L.) Urban.	Thankuni	Apiaceae	Herb	Frequent	Mar-Dec	HK-23
24	*Clerodendrum viscosum* Vent.	Vat	Verbenaceae	Shurb	Abundant	Feb-Mar	HK-24
25	*Cissus quadrangularis* L.	Harjora	Vitaceae	Herb	Rare	Aug-Sep	HK-25

26	*Cynodon dactylon* (L.) Pers.	Durbaghas	Poaceae	Herb	Abundant	Jan-Dec	HK-26
27	*Calotropis procera* L.	Akondo	Asteraceae	Shurb	Frequent	Apr-May	HK-27
28	*Cirsium arvense* L.	Shial-kanta	Asteraceae	Herb	Abundant	Feb-Jun	HK-28
29	*Cuscuta reflexa* Roxb.	Sarnalata	Cuscutaceae	Climber	Rare	Jan-Dec	HK-29
30	*Cyathula protrata* (L.) Bume.	Boroapang	Amaranthaceae	Herb	Rare	Sep-Nov	HK-30
31	*Digitaria sanguinalis* (L.) Mart.	Gemegeba	Poaceae	Herb	Rare	Jan-Dec	HK-31
32	*Digitaria ischaemum* L.	Crabgrass	Poaceae	Herb	Rare	Jan-Dec	HK-32
33	*Datura metel* L.	Dhutra	Solanaceae	Shurb	Frequent	Jul-Dec	HK-33
34	*Eclipta alba* (L.) Hassk	Kalokeshi	Asteraceae	Herb	Frequent	Jan-Dec	HK-34
35	*Enhydra fluctuans* Lour.	Helencha	Asteraceae	Herb	Frequent	Jan-Dec	HK-35
36	*Euphorbia hirta*L.	Dudhia	Euphorbiaceae	Herb	Abundant	Oct-May	HK-36
37	*Euphorbia helioscopia* L.	Euphorbia	Euphorbiaceae	Herb	Abundant	Jun-Dec	HK-37
38	*Euphorbia thymifolia* L.	Cotidudhia	Euphorbiaceae	Herb	Frequent	Oct-Feb	HK-38
39	*Eichhornia crassipes* (Mart.) Solms.	Kochuripana	Pontederiaceae	Herb	Abundant	Jan-Dec	HK-39
40	*Eleusine indica* L.	Malankuri	Poaceae	Herb	Rare	Jan-Dec	HK-40
41	*Glinus oppositifiilus* (L.) A. DC.	Gimashak	Molluginaceae	Herb	Rare	Mar-Jul	HK-41
42	*Glycosmis pentaphylla* (Retz.) DC.	Atishora	Rutaceae	Shurb	Frequent	Jan-Dec	HK-42
43	*Heliotropium indicum* L.	Hatisur	Boraginaceae	Herb	Abundant	Jan-Dec	HK-43
44	*Ipomea alba* L.	Dudhkalmi	Convolvulaceae	Shurb	Rare	Jan-Dec	HK-44
45	*Ipomea aquatica* Forsk.	Kalmishak	Convolvulaceae	Herb	Frequent	Jan-Oct	HK-45
46	*Justicia adhatoda* L.	Basak	Acanthaceae	Shurb	Frequent	Jan-Apr	HK-46
47	*Justicia gendarussa* Burm.f.	Jagathmadan	Acanthaceae	Shurb	Abundant	Dec-May	HK-47
48	*Kalanchoe pinnata (*Lamk.) Pers.	Patharkuchi	Crassulaceae	Herb	Frequent	Jun-Sep	HK-48
49	*Leucas aspera (*Willd) Link.	Shetodron	Lamiaceae	Herb	Abundant	Mar-Aug	HK-49
50	*Leucas cephalotes (*Roth.) Spreng	Bara halkusa	Lamiaceae	Herb	Rare	Jan-Feb	HK-50
51	*Launaea aspleniifolia Hook.*	Tik-chana	Asteraceae	Herb	Frequent	Jan-Aug	HK-51
52	*Ludwigia decurrens* (L.) Hara.	Ludwigia	Onagraceae	Herb	Frequent	Jan-Dec	HK-52
53	*Ludwigia perennis* L.	Ludwigia	Onagraceae	Herb	Frequent	Jan-Dec	HK-53
54	*Ludwigia adscendens* L.	Ludwigia	Onagraceae	Herb	Frequent	Jan-Dec	HK-54
55	*Leptochloa chinensis* L.	Bishkatali	Poaceae	Herb	Frequent	Jan-Jul	HK-55
56	*Lantana camara* L.	Lantana	Verbenaceae	Shurb	Frequent	Sep-Dec	HK-56
57	*Marsilea minuta* L.	Amrul	Marsileaceae	Herb	Frequent	Jan-Dec	HK-57
58	*Marsilea crenata* L.	Amrul	Marsileaceae	Herb	Frequent	Jan-Dec	HK-58
59	*Marsilea quadrifolia* L.	Amrul	Marsileaceae	Herb	Frequent	Jan-Dec	HK-59
60	*Mimosa pudica* L.	Lajjaboti	Fabaceae	Herb	Frequent	Aug-Nov	HK-60
61	*Mikania cordata* (Burm.f.) Robinson	Asamlata	Asteraceae	Climber	Abundant	Oct-Feb	HK-61
62	*Mollugo pentaphylla* L.	Mollugo	Molluginaceae	Herb	Frequent	Mar-Jul	HK-62
63	*Nicotiana plumbaginifolia* Viv.	Bantamak	Solanaceae	Herb	Abundant	Mar-Jun	HK-63

64	*Oxalis corniculata* L.	Amrul	Oxalidaceae	Herb	Abundant	Sep-Mar	HK-64
65	*Oxalis rubra* A. St. Hil.	Baroamrul	Oxalidaceae	Herb	Abundant	Sep-Mar	HK-65
66	*Ocimum tenuiflorum* L.	Tulshi	Lamiaceae	Herb	Frequent	Apr-Jun	HK-66
67	*Ocimum basilicum* L.	Babuitulsi	Lamiaceae	Herb	Frequent	Jan-Dec	HK-67
68	*Portulaca oleracea* L.	Nuniashak	Portulacaceae	Herb	Frequent	Sep-Mar	HK-68
69	*Parthenium hysterophorus* L.	Gandi-boti	Asteraceae	Herb	Abundant	Jan-Dec	HK-69
70	*Peperomia pellucida* (L.) H.B.K.	Peperomia	Piperaceae	Herb	Frequent	Jan-Mar	HK-70
71	*Physalis minima* L.	Kapalphutki	Solanaceae	Herb	Frequent	Sep-Dec	HK-71
72	*Pouzolzia indica* (L.) Bennett & R. Br.	Pouzolzia	Urticaceae	Herb	Frequent	May-Sep	HK-72
73	*Polygonum barbatum* L.	Biskatali	Polygonaceae	Herb	Abundant	Jun-Dec	HK-73
74	*Polygonum hydropiper* L.	Biskatali	Polygonaceae	Herb	Frequent	Jul-Sep	HK-74
75	*Polygonum orientale* L.	BoroBiskatali	Polygonaceae	Herb	Frequent	Jan-Mar	HK-75
76	*Polygonum plebejum* L.	Raniphul	Polygonaceae	Herb	Rare	Jan-Apr	HK-76
77	*Phyllanthus niruni* L.	Bhui-amla	Phyllanthaceae	Herb	Frequent	Apr-Sep	HK-77
78	*Phyllanthus urinaria* L.	Hazar-mani	Phyllanthaceae	Herb	Frequent	Feb-Mar	HK-78
79	*Phyla nodifolia*L.	Bhui-okra	Acanthaceae	Herb	Abundant	Jun-Aug	HK-79
80	*Paspalum distichum* L.	knotgrass	Poaceae	Herb	Frequent	Oct-Mar	HK-80
81	*Stephania japonica* (Thunb.) Miers.	Akarnandi	Menispermaceae	Climber	Frequent	Jan-Dec	HK-81
82	*Sida acuta* Brum. f.	Kureta	Malvaceae	Herb	Frequent	Sep-Jan.	HK-82
83	*Senna occidentalis* Roxb.	Chakunda	Fabaceae	Shurb	Frequent	Sep-Nov	HK-83
84	*Senna tora* (L) Roxb.	Chakunda	Fabaceae	Herb	Frequent	Sep-Nov	HK-84
85	*Solanum nigrum* L.	Titbegun	Solanaceae	Herb	Abundant	Jan-Dec	HK-85
86	*Sonchus asper* (L.) Hill.	Sonchus	Asteraceae	Herb	Abundant	Sep-Jun	HK-86
87	*Sonchusarevensis*L.	Sonchus	Asteraceae	Herb	Frequent	Nov-Jun	HK-87
88	*Synedrella nodiflora* (L.) Gaertn	Synedrella	Asteraceae	Herb	Abundant	Jan-Dec	HK-88
89	*Tridax procumbens* L.	Tridhara	Asteraceae	Herb	Abundant	Jan-Dec	HK-89
90	*Typhonium trilobatum* (L.) Schott.	Ghetkochu	Araceae	Herb	Frequent	Jan-Dec	HK-90
91	*Vernonia patula* (Dryand) Merril.	Kuksim	Asteraceae	Herb	Frequent	Jan-Dec	HK-91
92	*Wedelia chinensis* (Osbeck) Merr.	Mohavrin garaj	Asteraceae	Herb	Frequent	Jan-Dec	HK-92
93	*Wedelia biflora* (L.) DC. in Wight.	Mohavrin garaj	Asteraceae	Herb	Rare	May-Jul	HK-93
94	*Youngia japonica* (L.) DC.	Youngia	Asteraceae	Herb	Abundant	Aug-Jan	HK-94

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

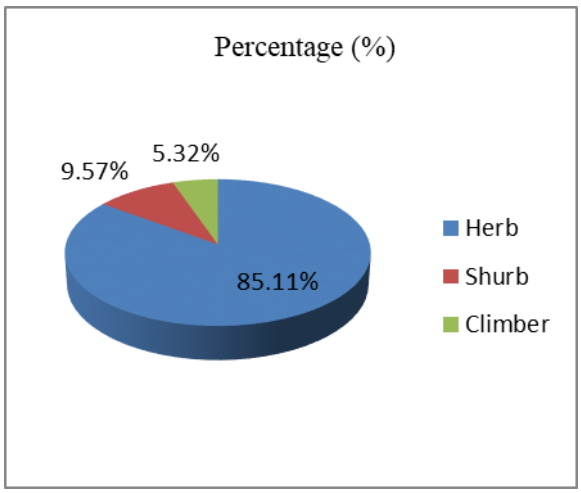

Fig. 1: Plant habit in the study area

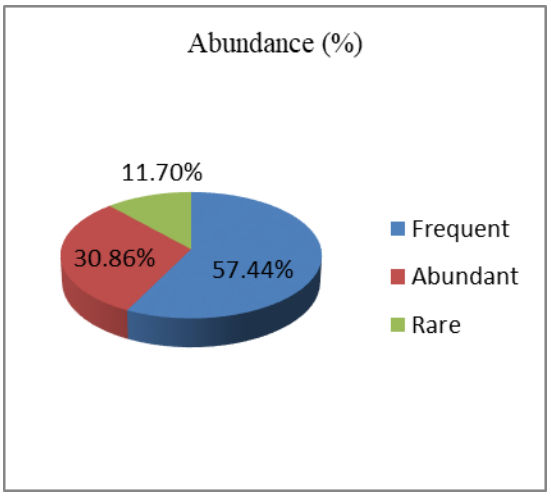

Fig. 3: Status of occurrence in the study area.

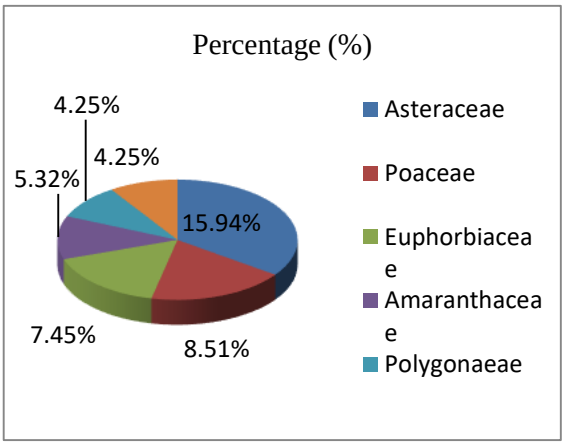

Fig. 2: Dominant Families in the study area

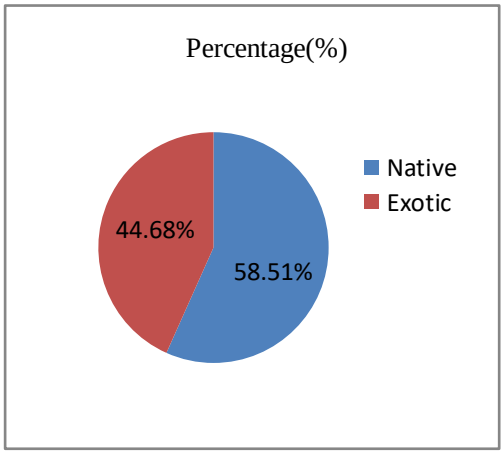

Fig. 4: Native and exotic species in the study area.

CONCLUSION

The present study was recorded an angiosperm weed diversity in and around Rajshahi University campus. A total of 94 weed species belonging to 70 genera under 36 families were recorded. Magnoliopsida (Dicotyledones) is represented by 31 families, 58 genera and 80 species, whereas Liliopsida (Monocotyledones) by 05 families, 12 genera and 14 species. It was concluded that overutilization, over the collection,overexploitation, habitat degradation, overharvesting, population explosion and overgrazing are theconspicuous biotic stresses which severely threatened the weed flora in the area which affect the population sustainabilityon earth crust.

ACKNOWLEDGEMENTS

The authors are thankful to the local people of the study areas for their active co-operation and help during the progress of research works.

REFERENCES

Ahmed ZU, Z.N.T.Begum, M.A.Hassan, M.Khondker, S.M.H.Kabir, M.Ahmad, A.T.A.Ahmed, A.K.A.Rahman and E.U.Haque (Eds). 2008-2009. Encyclopedia of Flora and Fauna of Bangladesh. Vols. 6-10. Asiatic Society of Bangladesh, Dhaka.

Akhtar, N. and F.Hussain. 2007. Weeds of wheat fields in village Qambar, District Swat , Pakistan . Pak . J. Weed .Res . 13(1): 31-35.

Dangwal L.R., A. Singh, A. Sharma and T. Singh. 2011. Diversity of Weed Species in Wheat Fields of Block Nowshera District Rajouri (Jammu and Kashmir). Indian Journal of Weed Science , 43 (1 & 2) : 94-96.

Hassan, G.A., B.A. Tali, A.A. Khuroo, A.R. Zafar and B.A. Wafai. 2015. Taxonomic diversity, distribution pattern and management implications of weed flora in rice fields of Kashmir Valley. Indian Journal of Weed Science. 47(1): 11-15.

Huq, A.M. 1986. Plant Names of Bangladesh.Bangladesh National Herbarium, BARC, Dhaka, Bangladesh.

Hooker, J.D. 1877. Flora of British India. Vols.1-7. L. Reeve and Co. Ltd. London, U.K.

Khan, R.U, S.M. Wazir, M. Subhan, S. Ullah, H. Ullah, A.Farooq, F.Jaffar, S.I.A. Shazia and M. Kamal. 2012. Weed Flora in Sugarcane of District Banu, Khyber PakhtunKhawa, Pakistan. Pak. J. Weed. Sci. Res. 18(4): 541-552.

Mondal, D.C. and A. Hossain, 2015, Density, survival and seed production potential of important weeds of lateritic belt of West Bengal . Indian Journal of Weed Science, 47(1): 103-105.

Nithya J. and D. Ramamoorthy. 2015. Floristic Composition and weed diversity in Rice fields. Indian Journal of Weed Science, 47(4): 417-421.

Rahman, A.H.M.M.and M.A.A..Mamun. 2017. Investigation and Taxonomic Studies of Angiosperm Weed Flora in the Mulberry Field of Rajshahi University Campus. *Species* 18(58): 42-56.

Singh, M, O.P. Singh and M.P. Singh. 2012. Floristic composition of weeds in mixed winter crop on Gujar lake's margins in Uttar Pradesh . Indian Journal of Weed Science , 44(1) : 62-64 .

Debnath, A. and A.H.M.M. Rahman. 2017. A Checklist of Angiosperm Taxa at the Village Pandit Para under PalashUpazila of Narsingdi District, Bangladesh with Special Importance to Medicinal Plants. *Species* 18(58): 23-41.

Islam, M. and A.H.M.M. Rahman. 2017. A Preliminary Taxonomic Account of the Family Araceae in Rajshahi District of Bangladesh. *Discovery* 53(253): 30-48.

Islam, M.J. and A.H.M.M. Rahman. 2016. An Assessment of the family Asteraceae at ShadullapurUpazila of Gaibandha District, Bangladesh with Particular Reference to Medicinal Plants. *Journal of Pregressive Research in Biology* 2(2): 108-118.

Keya, M.A. and A.H.M.M. Rahman. 2017. Angiosperm Diversity at the Village Sabgram of Bogra, Bangladesh with Emphasis on Medicinal Plants. *American Journal of Plant Biology* 2(1): 25-34.

Kona, S. and A.H.M.M Rahman. 2015. An Assessment of Angiosperm Diversity at MahadebpurUpazila of Naogaon District, Bangladesh. *International Journal of Advanced Research* 3(10): 1067-1086.

Nahar, J and A.H.M.M. Rahman. 2016. Floristic Diversity of Naogaon Sadar, Bangladesh with Special Reference to Medicinal Plants. *Discovery* 52(252): 2352-2368.

Naik, V.N. 2003. Taxonomy of Angiosperms. Tata McGraw-Hill Publishing Company Limited, New Delhi, India.

Pasha, M.K. and S.B.Uddin. 2013. Dictionary of Plant Names of Bangladesh (Vascular

Plants). JanokalyanProkashani. Chittagong, Dhaka, Bangladesh.

Preston, P. and Dines. 2002. New Atlas of the British Flora. Oxford University Press. UK.

Prain D 1903. Bengal Plants.Vols.1-2. Botanical Survey of India. Calcutta, India.

Rahman, A.H.M.M. and M.Akter. 2013. Taxonomy and Medicinal Uses of Euphorbiaceae (Spurge) Family of Rajshahi, Bangladesh. *Research in Plant Sciences* 1(3): 74-80.

Rahman, A.H.M.M. and A.Debnath. 2014. Angiosperm Diversity of Pandit Para Village under PalashUpazila of Narsingdi District, Bangladesh. *Frontiers of Biological & Life Sciences* 2(4): 98-105.

Rahman, A.H.M.M. and M.I.A.Gulshana. 2014. Taxonomy and Medicinal Uses on Amaranthaceae Family of Rajshahi, Bangladesh. *Applied Ecology and Environmental Sciences* 2(2): 54-59.

Rahman, A.H.M.M. and M. Jamila. 2015. An Assessment of Angiosperm Taxa at the village Jamtala under sadarUpazila of Chapai Nawabganj District, Bangladesh. *Research & Reviews: Journal of Botanical Sciences* 4(4): 13-22

Rahman, A.H.M.M. and M.A.Keya. 2014. Assessment of Angiosperm Flora at the Village Sabgram under Sadar Upazila of Bogra District, Bangladesh. *International Journal of Advanced Research* 2(11): 443-458.

Rahman, A.H.M.M. and M.I.A. Parvin. 2015. Taxonomic Studies on the family Fabaceae (Weeds) at Rajshahi University Campus. *Plant* 3(3): 20-25.

Rahman, A.H.M.M. and M.M. Rahman. 2014. An Enumeration of Angiosperm weeds in the Paddy field of Rajshahi, Bangladesh with emphasis on medicinal Plants. *Journal of Applied Science and Research* 2(2): 36-42.

Rahman, A.H.M.M. and Rojonigondha. 2014. Taxonomy and Traditional Medicine Practices on Malvaceae (Mallow Family) of Rajshahi, Bangladesh. *Open Journal of Botany* 1(2): 19-24.

Rahman, A.H.M.M. 2013. Angiospermic flora of Rajshahi district, Bangladesh. *American Journal of Life Sciences* 1(3): 105-112.

Rahman, A.H.M.M. 2021. A Preliminary Assessment of Angiospermic Flora in and around Rajshahi metropolitan city, Bangladesh.*Applied Ecology and EnviromemtalSciences* 9(4): 440-449.

Rahman, A.H.M.M., M.S. Alam, M.B. Hossain, M.N. Nesa, A.K.M.R.Islam and M.M. Rahman. 2008. Study of Species Diversity on the family Asteraceae (Compositae) of the Rajshahi Division. *Research Journal of Agriculture and Biological Sciences* 4(6): 794-797.

Rahman, A.H.M.M., M. Anisuzzaman, F. Ahmed, A.T.M.N. Zaman and A.K.M.R. Islam. 2007. A Floristic Study in the Graveyards of Rajshahi City. *Research Journal of Agriculture and Biological Sciences* 3(6): 670-675.

Rahman, A.H.M.M., Z. Ferdous and A.K.M.R.Islam. 2014. A Preliminary Assessment of Angiosperm Flora of Bangladesh Police Academy. *Research in Plant Sciences* 2(1):9-15.

Rahman, A.H.M.M., A.K.M.R. Islam, A.T.M.Naderuzzaman, M.D. Hossain and R. Afza. 2007. Studies on the Aquatic Angiosperms of the Rajshahi University Campus.*Research Journal of Agriculture and Biological Sciences* 3(5): 474-480.

Roy, T.R. and A.H.M.M. Rahman. 2018. Inventory of Angiosperm Diversity in

IshwardiPouroshova of Pabna District, Bangladesh, *Discovery Science* 14: 9-22.

Sarker, A.K. and A.H.M.M. Rahman.2016. A Preliminary Checklist of Angiosperm Flora at KatakhaliPouroshova of Rajshahi, Bangladesh. *Discovery* 52(251): 2127-2140.

Sarker, P. and A.H.M.M. Rahman. 2019. Angiosperms in GobindaganjUpazila of Gaibandha District, Bangladesh. *Bangladesh Journal of Plant Taxonomy* 26(2): 285-298.

Sarker, U. and A.H.M. Rahman. 2017. Diversity of Weed Species in Mustard Fields of Manda Upazila of Naogaon District, Bangladesh. *Species* 18(59): 133-145.

Sultana, R and A.H.M.M. Rahman. 2016. Convolvulaceae: A Taxonomically and Medicinally Important Morning Glory Family. *International Journal of Botany Studies* 1(3): 47-52.

Uddin, K., A.H.M.M. Rahman and A.K.M.R. Islam. 2014. Taxonomy and Traditional Medicine Practices of Polygonaceae (Smartweed) Family at Rajshahi, Bangladesh. *International Journal of Advanced Research* 2(11): 459-469.

Uddin, M.Z., M.F. Alam, M.A. Rahman and M.A. Hassan. 2013. Diversity in Angiosperm Flora of Teknaf Wildlife Sanctuary, Bangladesh. *Bangladesh Journal Plant Taxonomy* 20(2): 145-162.

Uddin, M.Z. and M.A.Hassan. 2010. Angiosperm Diversity of Lawachara National Park (Bangladesh): A Preliminary Assessment. *Bangladesh J. Plant Taxon.* 17(1): 9-22.

Zahra, F. and A.H.M.M. Rahman. 2018. Documentation of Angiosperm Weed Flora in and around Rajshahi Metropolitan City, Bangladesh. *Discovery Agriculture* 4: 33-46.